

IQMUX30

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

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

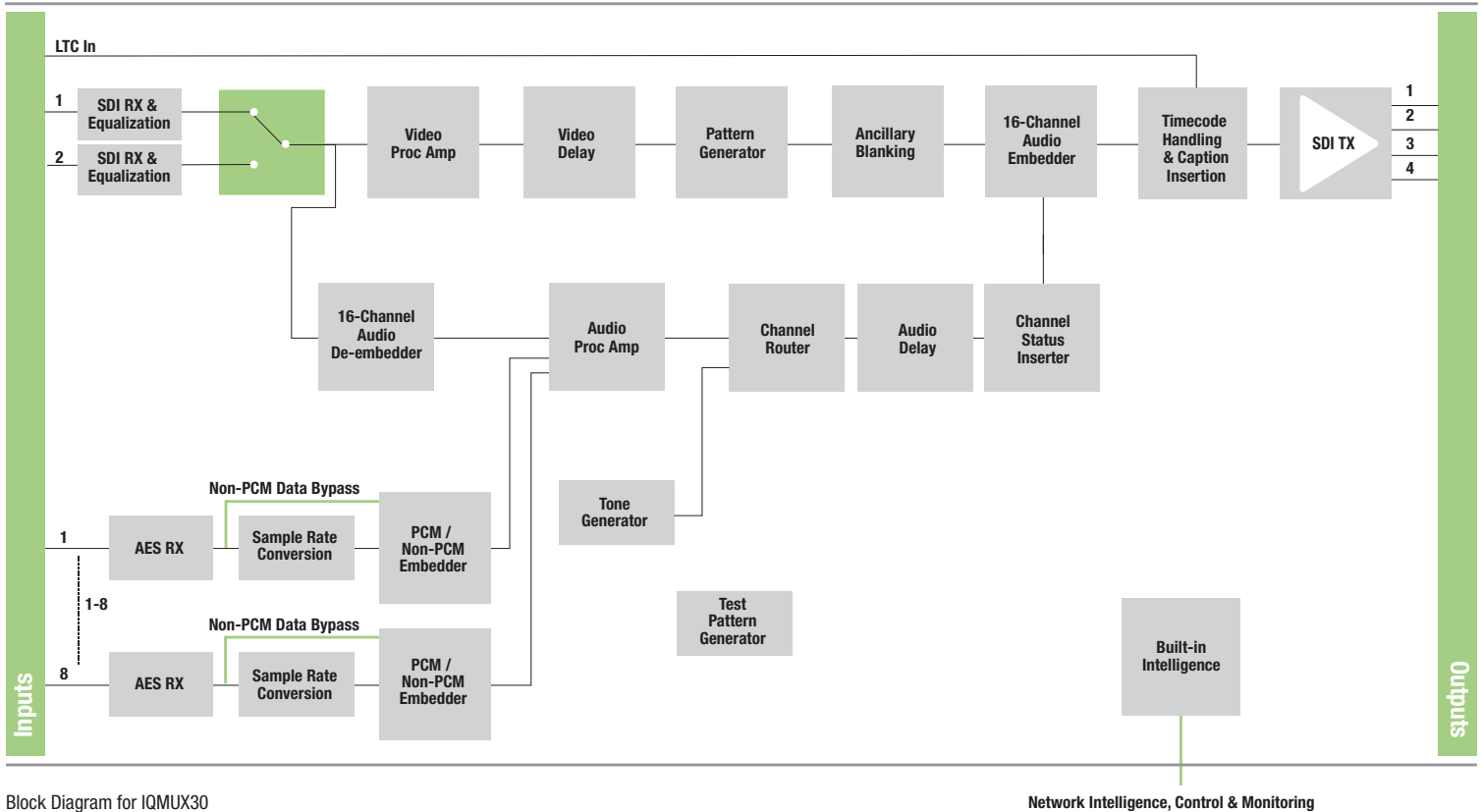
The IQMUX30 from Grass Valley provides 16-channel digital audio embedding for 3G-SDI 3 Gb/s, HD-SDI 1.5 Gb/s or SD-SDI 270 Mb/s signals. Audio processing features include audio delay, gain, invert and channel level routing, while video delay and a video proc amp are also included in the feature set. Ideal as a general 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
- Suitable for multilingual audio applications thanks to channel-level control and up to sixteen channel operation
- 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

- 16-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
- LTC timecode insertion and embedded timecode handling support, including ability to output via the caption mechanism for monitoring purposes
- 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
- 2 SDI inputs and up to 4 active HD/SD-SDI outputs
- 16x user memories, save/recall/rename
- GV Orbit control and monitoring compatible



Block Diagram for IQMUX30

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: 8x AES/EBU, AC3, Dolby E (BNC)

Balanced digital audio: 8x AES/EBU, AC3, Dolby E (25-way D-type)

Signal Outputs

SDI outputs: 2x (4)

Controls

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 mVHue adjust: $\pm 180^\circ$ in steps of 1° Master video gain: ± 6 dB in steps of 0.1 dBY-Gain: ± 6 dB in steps of 0.1 dBCb/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 8 source L / non-PCM dis-embed: 1_1 to 8_2, AES 1 to 8, Tone, Silence

Pair 1 to 8 source R dis-embed: 1_1 to 8_2, AES 1 to 8, 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

Processed Audio Delay Control

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

Fine manual delay: ± 0.25 s in 0.5 ms steps

Dolby E

Dolby E auto alignment: On/Off

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

SPECIFICATIONS (CONT.)

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 1-8) PCM, AES (Pairs 1-8) Data, AES (Pairs 1-8) Dolby E, AES (Pairs 1-8) V bit, AES (Pairs 1-8) 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: >150m 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

LTC Input Format

According to: SMPTE ST 12 2008c

Frame rate: 23.94, 24, 25, 29.97, 30, 50, 59.98 and 60 fps

Level: 0.4V to 5 Vp-p for unbalanced and 0.2V to 5 Vp-p for balanced

LTC Port Unbalanced

Input connector type: BNC

Input impedance: 75Ω

Input signal range: 0.4 Vp-p to 5 Vp-p

LTC Port Balanced

Input connector type: Differential via 2 pins of 25-pin D-Sub female AES AUDIO/LTC IN (and GND pin)

Input impedance: 10 kΩ

Input signal range: 0.2 Vp-p to 5 Vp-p

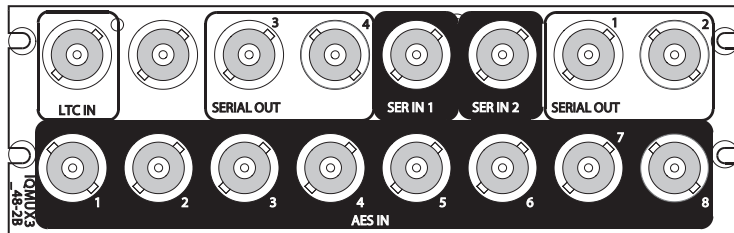
Power Consumption

Module power consumption: 8 PR (B Frames)

ORDERING

IQMUX3048-2B3

3G/HD/SD-SDI 16-channel AES embedder. 4 SDI outputs, 8 unbalanced AES inputs, 1 unbalanced LTC input.



IQMUX3049-1B3

3G/HD/SD-SDI 16-channel AES embedder. 2 SDI outputs, 8 balanced AES inputs, 1 balanced LTC input.



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