

# IQBRK30

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

Audio processing features on any of the selected 16 embedded channels include audio delay, gain, invert and channel level routing, with video delay and a video proc amp included.

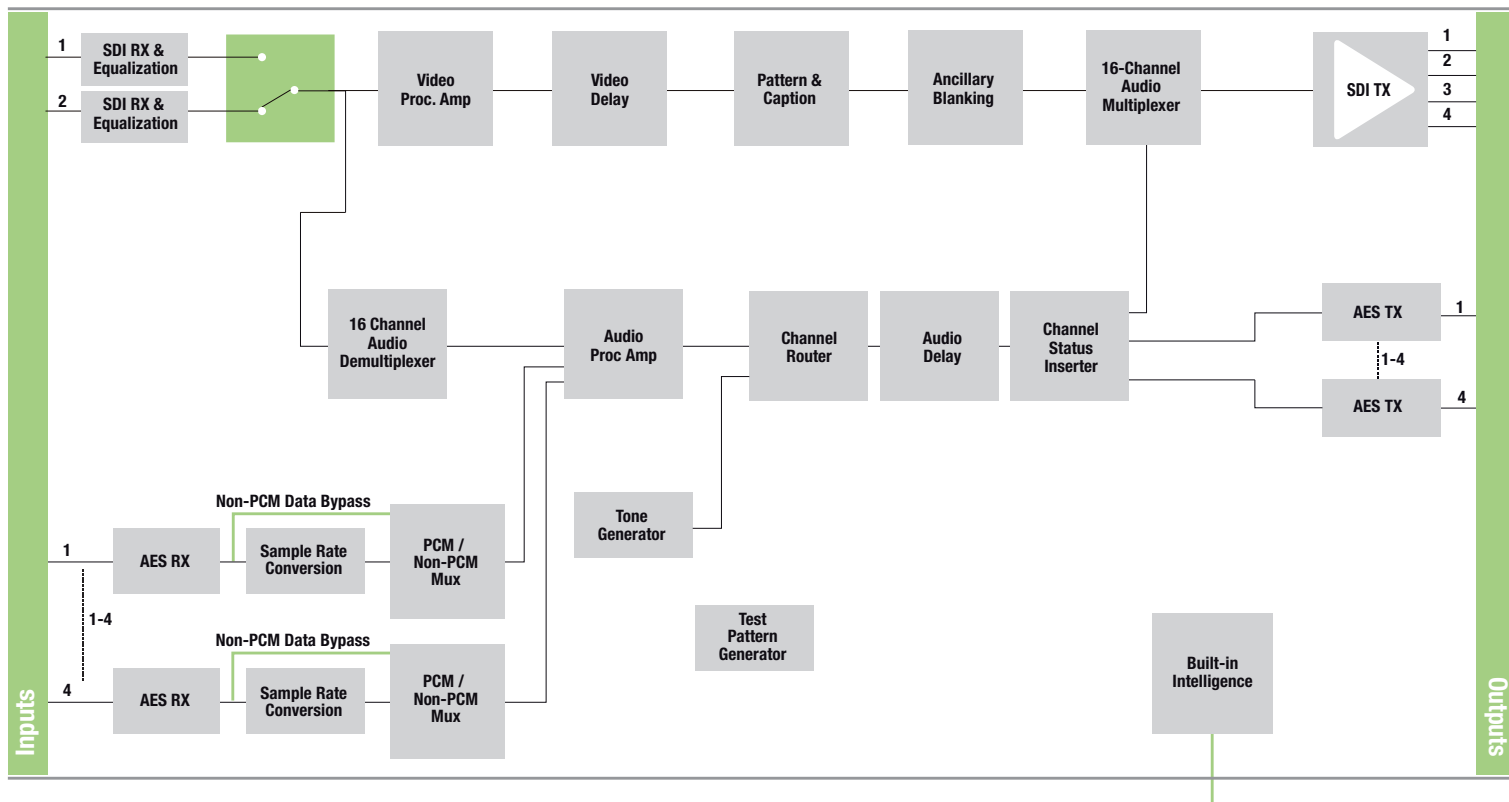
The IQBRK30 from Grass Valley provides 8-channel digital audio de-embedding and re-embedding for 3 Gb/s SDI, HD-SDI 1.5 Gb/s or SD-SDI 270 Mb/s signals. Able to select any of the 16 embedded channels, audio processing features include audio delay, gain, invert and channel level routing, while video delay and a video proc amp are also included in the feature set. Ideal for breaking out embedded audio to AES-only devices for processing then re-ingesting the resulting feeds back into the SDI domain.

### Why should you choose this module?

- Ideal as a re-embedder for stereo, multichannel or Dolby E AES audio applications
- Suitable for multilingual audio applications thanks to channel-level control and up to 16-channel operation
- 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 re-embedder capable of embedding and re-embedding up to four AES signals
- 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 including VANC metadata
- Video controls including video gain and offset
- Built-in test pattern generator and audio tone generator
- Two SDI inputs and up to four active HD/SD-SDI outputs
- 16x user memories, save/recall/rename
- RollCall control and monitoring compatible



Block Diagram for IQBRK3048-2B3

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

**Controls**

**Video Controls**

Input standard:  
 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 standard:  
 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  
 Video select: Input 1, Input 2  
 Audio select: Video Input 1, Video Input 2, Follow Video  
 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 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 AES assignment: On/Off  
 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 processed audio delay control: On/Off  
 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  
**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)

**SPECIFICATIONS (CONT.)**

**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 1-8) PCM, AES (Pairs 1-8) Data, AES (Pairs 1-8) DolbyE, 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) DolbyE, 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  
 625/576i29.97, 525/480i25  
 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: 2-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

**Digital Audio Output (Balanced)**

Connector/format: 25-way D-type  
 Level: 3 Vp-p typical into 110Ω  
 Standard: AES3, SMPTE ST 272-A-1994, SMPTE ST 299

**Digital Audio Output (Unbalanced)**

Connector/format: BNC  
 Level: 1 Vp-p typical into 75Ω  
 Standard: AES3id, SMPTE ST 272-A-1994, SMPTE ST 299

**Power Consumption**

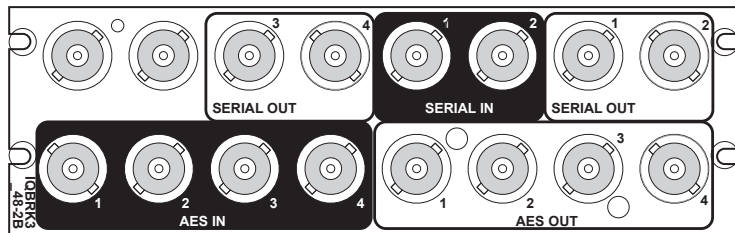
Module power consumption: 8.5 PR (B Frames)

**ORDERING**

**IQBRK3048-2B3**

**3G/HD/SD-SDI 16 channel AES Re-embedder**

4 SDI outputs, 4 unbalanced AES inputs, 4 unbalanced AES outputs



**IQBRK3049-1B3**

**3G/HD/SD-SDI 16 channel AES Re-embedder**

2 SDI outputs, 4 balanced AES inputs, 4 balanced AES outputs



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

GVB-2-0773A-EN-DS



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