

IQSYN31

Dual 3G/HD/SD-SDI Frame Synchronizer with Embedded Audio Processing

The IQSYN31 provides frame synchronization for HD-SDI at 3Gbit/s or 1.5 Gbit/s, or SD-SDI 270 Mbit/s with 16-channel embedded audio processing. Enabling powerful processing features with a space efficient two channels per card the IQSYN31 is ideal for incoming line applications where space is at a premium. A video proc. amp provides complete control over the video levels, and audio processing features include Dolby E auto-alignment, audio delay, gain, invert and channel level routing.

Features

- Dual channel 3G/HD/SD-SDI synchronizer with up to 3 frames of video delay per channel
- Processing for 16 channels of embedded audio present on each incoming SDI stream
- Standards supported:
 - 3G-SDI to SMPTE 424M/425M level A & B compatible
 - HD-SDI to SMPTE 292M/274M/296M
 - SD-SDI to SMPTE 259M-C
- Loop-through reference capable of detecting and referencing to a bi-level or tri-level signal and selection from either external input directly or from internal IQH3B chassis reference bus
- Precision genlock adjustment allowing you to time any SDI signal accurately
- Agile, router switching tolerant synchronizer operation
- Firewall for video and processed PCM audio to provide a continuous uninterrupted output
- Audio proc-amp features including channel level (Sub-frame) routing, adjustable delay, independent gain, invert and mute control
- Any group of embedded audio may be passed unchanged, processed or blanked
- Embedded Dolby E support – pair routing and Dolby E header alignment
- Handles Dolby E and PCM audio present in the same group
- Able to pass all ancillary data with independent HANC and VANC blanking control
- Input loss detection – default output of black/pattern/freeze
- Can be used as a video delay, up to 3 frames per channel
- Video proc. amp controls including video gain, offset and hue
- In-built test pattern and tone generators for each channel
- 16 x user memories, save/recall/rename
- RollCall control and monitoring compatible

Why should you choose this module?

- Compact multi-channel synchronizer for lines in applications where space is at a premium, in OB environments for example
- Agile video synchronization provides greater tolerance to mis-timed upstream SDI switching (up to +/- 5 lines), ensuring disturbance free picture output
- Advanced embedded audio processing features, such as Dolby E synchronization, provide ideal solutions for today's complex system requirements
- Full RollCall and SNMP compatibility allows easy integration with SAM, 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

Order codes



IQSYN3147-1A3

Dual channel 3G/HD/SD-SDI Synchronizer with Embedded Audio Processing. 2 outputs per input, reference loop-through.

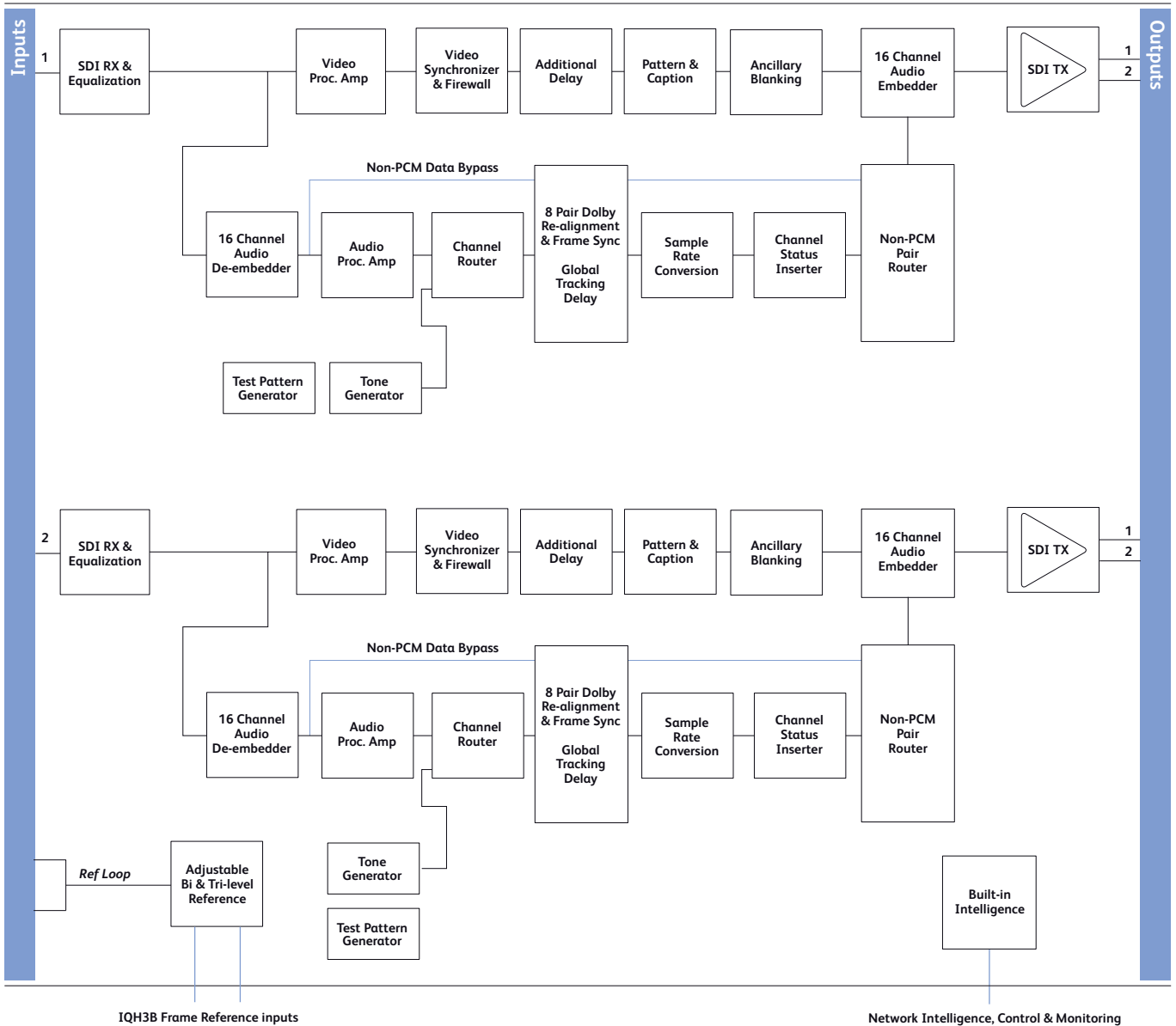
IQSYN3147-1B3

Dual channel 3G/HD/SD-SDI Synchronizer with Embedded Audio Processing. 2 outputs per input, external loop-through and internal frame reference selection.

For more details on enclosure types please refer to Frames and Hardware section.

IQSYN31

Dual 3G/HD/SD-SDI Frame Synchronizer with Embedded Audio Processing



Block Diagram for IQSYN3147-1A3

Technical Specification

Inputs & Outputs

Signal Inputs

SDI Inputs	1 per Channel
Input 1 Cable Length	Up to 70m Belden 1694A @ 3 Gbit/s Up to 160m Belden 1694A @ 1.5 Gbit/s >350m Belden 1694A @ 270 Mbit/s
Input 2 Cable Length	Up to 60m Belden 1694A @ 3 Gbit/s Up to 100m Belden 1694A @ 1.5 Gbit/s Up to 200m Belden 1694A @ 270 Mbit/s
Analog Reference	1 x Analog Reference with passive loop-through Black (HD tri-level and SD bi-level) and Black Burst (SD bi-level) SD bi-level – RS170A HD Tri-level – SMPTE 240M, 274M and 296M

Signal Outputs

SDI Outputs x 2 per Channel

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)
Reference lock	OK or Cross-locking (Green), Std error (Green flashing)

Technical Specification cont...

Controls

Genlock & Video Delay

Genlock Mode	Free-run, Lock to Reference, Lock to input
Genlock H-Phase	± 0.5H in pixel clock steps
Genlock V-Phase	± 0.5F in 1 line steps
Video H-Delay	0 – 1 Line in pixel clock steps
Video V-Delay	0 – 1 Frame in 1 line steps
Video Delay Frames	0 - 3 F

Video Controls (per Channel)

Input Standard	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
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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

Manual Freeze	On/Off
Freeze	Field/Frame
VANC Data	Blank VANC
SD VANC Data	Line blanking (23/336 in 625, 21,22, 283, 284 in 525)
HANC Data	Blank HANC (Removes all HANC data, including audio)
ProcAmp 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 (per Channel)

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

Processed Audio Delay Control

Course Manual Delay	Up to 1.75s in 5ms steps
Fine Manual Delay	+/- 0.25s in 0.5ms steps
Variable Audio Delay Control Source	Internal, Manual, RollTrack (14 to 17)

Dolby-E

Dolby-E Auto

Alignment	On/Off
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)

Audio Monitoring

Silence Detect	0 to -80dB in steps of 1dB
Signal Overload Detect	0 to -80dB in steps of 1dB
Warning Timer	1 to 20 seconds in steps of 1 second

Other Controls

User Memories	16 x Save, Recall, Rename
Memory Naming	User configurable naming of memories 1 – 16
RollTrack Sources	Unused, Video Delay (1&2), Audio Delay (1&2), Input Present (1&2), Input Loss (1&2), Input Select (1&2), Output Rate/Std (1&2), Output Freeze(1&2), Output Unfreeze(1&2), Output Pattern On(1&2), Output Pattern Off(1&2), Output Black On(1&2), Output Black Off(1&2), Output Caption On(1&2), Output Caption Off(1&2), Inp1 Embedded Audio (Pairs 1-8) PCM, Inp1 Embedded Audio (Pairs 1-8) Non-PCM, Inp1 Embedded Audio (Pairs 1-8) Loss, Inp1 Embedded Audio (Pairs 1-8) V Bit, Reference OK & Loss, Inp2 Embedded Audio (Pairs 1-8) PCM, Inp2 Embedded Audio (Pairs 1-8) Non-PCM, Inp2 Embedded Audio (Pairs 1-8) Loss, Inp2 Embedded Audio (Pairs 1-8) V Bit.
Information Window	Video Input Status, Audio Input Status, Reference 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

Technical Specification cont...

Specifications

Electrical	3Gbit/s SDI, SMPTE 424M 1.5Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C /DVB-ASI
Connector / Format	BNC/ 75ohm panel jack on standard IQ connector panel
Return loss	>-15dB (270Mbit/s, 1.5Gbit/s) >-10dB (3Gbit/s)
Output Jitter	SD-SDI 0.2 UI (10Hz) / 0.2 UI (1KHz) 3G/HD-SDI 1.0 UI (10Hz) / 0.2 UI (100KHz)
Reference Source	External – HD Tri-Level / SD Bilevel/ Input Video syncs
Electrical	Black (HD tri-level and SD bi-level) and Black Burst (SD bi-level) SD bi-level – RS170A HD Tr-level – SMPTE 240M, 274M and 296M
Connector / Format	BNC/75 ohm panel jack on standard IQ connector panel
Analog Reference Return Loss	SD bi-level > 40 dB to 5.5 MHz HD tri-level > 35 dB to 30 MHz

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
Minimum Delay (Reference lock or free run)	SD: 67us HD: 28us 3G-A: 15us 3G-B: 25us
Typical delay (Input lock)	SD: 70us HD: 38us 3G-A: 19us 3G-B: 40us
Synchronizer Hysteresis Window	5 μ s
Embedded audio handling	HD - 24-bit synchronous 48 kHz to SMPTE 299M SD - 20-bit synchronous 48 kHz to SMPTE 272M-A
Embedded Audio Delay	Minimum (PCM) 2 ms Maximum (non-PCM) SD: 67us HD: 28us 3G-A: 15us 3G-B: 25us
Power Consumption	
Module Power Consumption	11W Max (A Frames) 10.5 PR (B Frames)