DATASHEET

IQSYN50

3G/HD/SD-SDI Frame Synchronizer

Agile frame synchronization for 3G/HD/SD-SDI signals with 32-channel embedded audio handling.

The IQSYN50 from Grass Valley provides frame synchronization for HD-SDI at 3 Gb/s or 1.5 Gb/s, or SD-SDI 270 Mb/s with 32-channel embedded audio handling. Including two SDI inputs, agile synchronization and audio firewall features means the IQSYN50 is ideal for general incoming line applications.

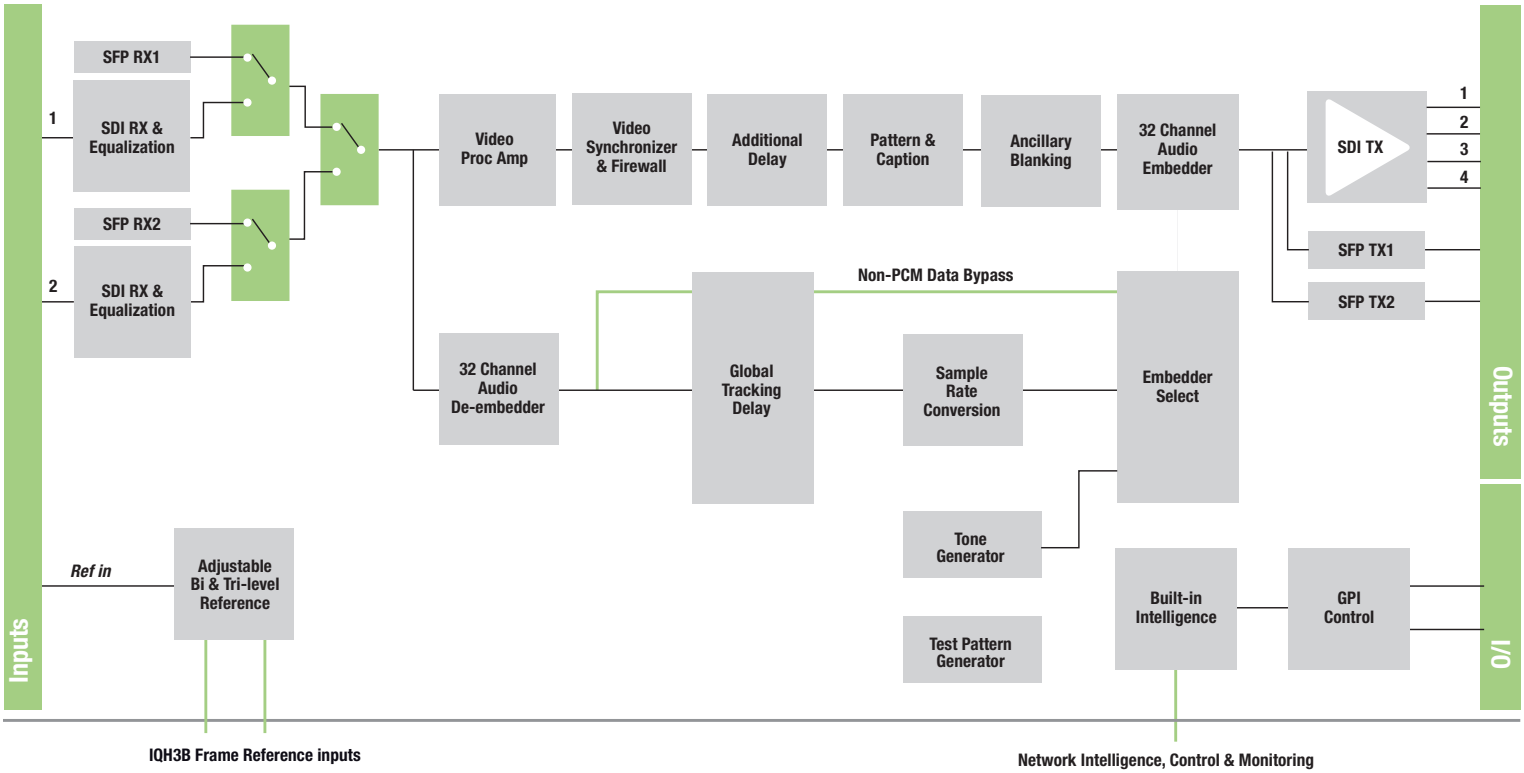
A video proc amp provides complete control over the video levels and RGB gamut legalization, along with tracking audio delay to avoid disturbance around synchronizer wrap points.

KEY FEATURES

- 3G/HD/SD-SDI synchronizer with additional video delay up to 30 frames at 1080, 60 frames at 720 and 120 frames at 625 and adjustable bulk audio delay up to 4.5s
- Agile, router switching tolerant synchronizer operation with precision genlock adjustment allowing you to time any SDI signal to pixel accuracy with greater tolerance to mis-timed upstream SDI switching (up to ± 10 lines adjustable), ensuring disturbance-free picture output
- Firewall for video and processed PCM audio to provide a continuous uninterrupted output
- Reference input capable of detecting and referencing to a bi-level or tri-level signal and selection from either external input directly or from internal chassis reference bus
- Connectivity: 2 SDI inputs, up to 4 SDI outputs, reference input, 8x GPI/O, relay bypass version with input 1 bypassed to output 1 on power loss or card removal
- Dual SDI inputs with auto switching on predefined input state errors — presence, carrier detect and valid CRC/EDH status
- 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
  – Fiber to SMPTE ST 297-2006C
- Able to pass all ancillary data with independent HANC and VANC blanking control (VANC blanking is input line selectable)
- Card-edge LED status indicators and input loss detection — default output of black/pattern/freeze/mute, and input SDI CRC, EDH and ANC data checking and reporting
- Video proc amp controls including video gain, offset, hue, RGB gamut legalization and Y/C picture position adjustment
- Support for up to 32 channels (at 3G-SDI) of embedded audio present on the incoming SDI stream to remove audio disturbance around the synchronizer wrap and drop points, and provide tracking audio delay
- Built in test pattern generator, two caption generators and audio tone generator
- 16x user memories, save/recall/rename, and up to 8 GPI/O ports
- Full GV Orbit compatibility provides an all-inclusive remote configuration, control and monitoring solution
- Up to 70 RollTrack destinations and triggers available for detected module states including input loss and reference loss
- Comprehensive SNMP support allows easy integration with third-party Network Management Systems

Options

- Single mode fiber optic transmitter and receiver options — including SFP HDMI output version to provide a built-in local monitoring output — rear option



Block Diagram for IQSYN5003-2B3.

SPECIFICATIONS

Inputs and Outputs

Video Standards Supported

1125 (1080)/50p (A & B), 1125 (1080)/59p (A & B), 1125 (1080)/60p (A & B), 1125 (1080)/25p,1125 (1080)/24p, 750 (720)/50p, 750 (720)/59p, 750 (720)/60p, 750 (720)/30p, 750 (720)/23p, 750 (720)/24p, 750 (720)/25p, 750(720)/29p, (1035)/29i, (1035)/30i, 1125 (1080)/25i, 1125 (1080)/29i, 1125 (1080)/23p, 1125 (1080)/23sF, 1125 (1080)/24sF, 625 (576)/25i, 525 (480)/29i

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

Analog reference:

- 1x analog reference black (HD tri-level and SD bi-level) and blackburst (SD bi-level), SD bi-level – RS170A
- HD tri-level – SMPTE ST 240, SMPTE ST 274 and SMPTE ST 296

Fiber Signal Input

Inputs:

- Up to 2
- Optical 3 Gb/s HD-SDI, 1.485 Gb/s HD-SDI or 270 Mb/s SD-SDI

Connector/format: LC singlemode

Standard: SMPTE ST 297-2006

Signal Outputs

SDI outputs: x4

Fiber Signal Output

Outputs:

- Up to 2
- Optical 3 Gb/s HD-SDI, 1.485 Gb/s HD-SDI or 270 Mb/s SD-SDI

Connector/format: LC singlemode

Standard: SMPTE ST 297-2006

Control Interface

GPI I/O: 8x closing contact via BNC

Controls

Indicators

Power: OK (Green)

CPU: Running (Green flashing)

FPGA running: OK (Green flashing)

Status: OK (Green), Warning (Yellow), Error (Red)

Input 1: OK (Green), Fail (Red)

Input 2: OK (Green), Fail (Red)

Rx 1: OK (Green), Fail (Red)

Rx 2: OK (Green), Fail (Red)

Genlock

Genlock Mode: Free-run, Lock to reference, Lock to input

Genlock H-Phase: ± 1 H in pixel clock steps

Genlock V-Phase: ± 1 F 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 – 14 frames @ 1080 50/59p level B
- 0 – 30 frames @ 1080 50/59p level A
- 0 – 30 frames @ 1080 23/24/25/29/30p
- 0 – 30 frames @ 1080 25/29/30i
- 0 – 60 frames @ 720 50/59/60p
- 0 – 30 frames @ 720 23/24/25/29/30p
- 0 – 120 frames @ 525 29i
- 0 – 120 frames @ 625 25i

Audio Delay:

- Delay add-in bulk, RollTrack, current video: On/Off
- Bulk manual delay: 0 ms to +1.75s in 1 ms steps
- Fine manual delay: 0 ms to +250 ms in 0.1 ms steps

Remote Controls

Default video output type: Input, Mute, TPG (Pattern, Captions, Tone), Black

Default video output standard: Last Known Good, 1125 (1080)/50P, 1125 (1080)/59P, 1125 (1080)/29i, 1125 (1080)/25i, 750 (720)/59P, 750 (720)/50P, 525 (480)/29i, 625 (576)/25i, Mute, Pattern

Valid Input Standard

Change-over parameters: No SDI lock, CRC (EDH) error

Switch delay: Video 0s to 600s (reversion) and 0fr to 16384fr (trigger condition)

GPI/O program: TALLY any input state or warning or set as trigger

Pattern select: Color Bars, Black

Edit caption: 19 characters available, size and position adjustment

Reporting & logging: Input loss; input line standard; EDH error; audio & data presence, change-over status, main video output

PCM tone setup

Frequency L/R: 100 Hz to10 kHz in 100 Hz steps

Channel ident: On/Off

Audio monitoring

Low-level detect: 0 to -80 dB in steps of 1 dB

Signal overload detect: 0 to -80 dB in steps of 1 dB

Other Controls

GPI input high/low select (Input 1-8): In Rules (Input 1, Input 2), Priority (None, Input 1, Input 2), Out 1(Input 1, Input 2), FollowOut 1 (On, Off), User Memory 1-16, Input 1 Pattern (On, Off), Input 2 Pattern (On, Off), Input 1 Caption (On, Off), Input 2 Caption (On, Off)

GPI level invert: High/Low

SPECIFICATIONS

GPI Output Source (Output 1-8): In Rules (Input 1, Input 2), Output 1 Rules (On, Off), Priority (None, Input 1, Input 2), Output 1 (Rules, Input 1, Input 2), User Memory 1-16, Input 1-2 (Present, Lost), Input 1-2 Valid (Ok, Fail), Output 1 on Input 1 and State (Ok, Fail), Output 1 on Input 2 and State (Ok, Fail), Output 1 manually set to Input 1 and State (Ok, Fail), Output 1 manually set to Input 2 and State (Ok, Fail), Output 1 on rules and Input 1 and State (Ok, Fail), Output 1 on Rules and Input 2 and State (Ok, Fail), Input 1 Pattern (On, Off), Input 2 Pattern (On, Off), Input 1 Caption (On, Off), Input 2 Caption (On, Off), Output 1 on Input 1, Output 1 on Input 2

User memories: 16x Save, Recall, Rename

Memory naming: User configurable naming of memories 1 – 16

Information window: Video input and output status, audio input status, rules status, network status

RollTrack Index: Up to 70 RollTrack destinations

RollTrack sources: Unused, User Memory 1-16, GPI/O 1-8 (high/low/not used), Rules Input (1-2), Output 1 (Rules, Input 1, Input 2), Output 1 Std, Input 1 Status (Ok, Fail), Input 2 Status (Ok, Fail), Input 1 Rules Status (Ok, Fail), Input 2 Rules Status (Ok, Fail), Output 1 Pattern (On, Off), Output 1 Captions (On, Off), Input 1 Pattern (On, Off),Input 1 Captions (On, Off), Input 2 Pattern (On, Off), Input 2 Captions (On, Off)

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, 1.5Gb/s HD-SDI, SMPTE ST 292, 270 Mb/s SDI, SMPTE ST 259-C

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)

GPI I/O (x8) characteristics:

Closing contact type with internal source

Input threshold voltage: 1V, typical

Module power consumption:

IQSYN5000-1B3 14.5PR Max.

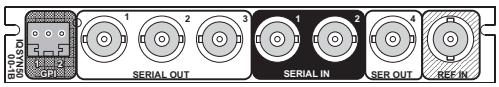
IQSYN5001-1B3 15PR Max.

IQSYN5003-2B3 15PR Max.

ORDERING

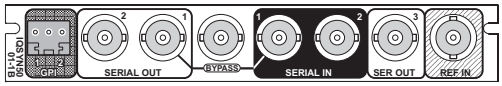
IQSYN5000-1B3

3G/HD/SD-SDI Synchronizer. 2 inputs, 4 outputs, external and internal frame reference selection, 2 GPI/Os.



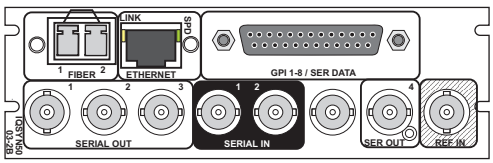
IQSYN5001-1B3

3G/HD/SD-SDI Synchronizer with relay input bypass. 2 inputs, 4 outputs, external and internal frame reference selection, 2 GPI/Os.



IQSYN5003-2B3

3G/HD/SD-SDI Synchronizer. 2 inputs, 4 outputs, external and internal frame reference selection, Fiber SFP Tx/Rx, Ethernet port, 8 GPI/Os.



Fiber SFP Options

FC1-13T1	Single 1310 nm Tx
FC1-13T2	Dual 1310 nm Tx
FC1-R1	Single Rx
FC1-R2	Dual Rx
FC1-13TR	Transceiver 1310 nm/Rx
FC1-HDBT2	HD-BNC Dual Tx
FC1-HDBR2	HD-BNC Dual Rx
FC1-HDMI2	HDMI Tx with 2m cable

CWDM Tx – Wavelengths available on request

Note: Fiber SFP type must be ordered in addition to the module.

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