Grass Valley

DATASHEET

SV2000 & SV4000

Up/down/cross-converters and Frame Sync

SV2000 and SV4000 are cost-effective, high-density up/down/crossconverters able to handle a wide range of video and audio processing and synchronization tasks.

Key Features

- SD/HD/3G up/down/crossconversion
- Independent dual channel (SV2000) and quad channel conversion (SV4000)
- Frame synchronization
- Flexible video and audio I/O configuration 16-channel embedded audio processing for each video channel
- Continuous output when input standard switches
- HDMI monitor output
- Dual PSU as standard
- Relay bypass on primary SDI inputs
- Automatic aspect ratio conversion (AFD, VI, L23)
- Powerful picture enhancement tools
- User friendly front panel as well as remote control via GV Orbit
- Closed caption and timecode handling
- User chosen line for SMPTE ST 2016
- GPI support
- Front panel control lock
- Caption generator
- Logo inserter
- Sidebar keyer
- Clean cut
- Composite input/output

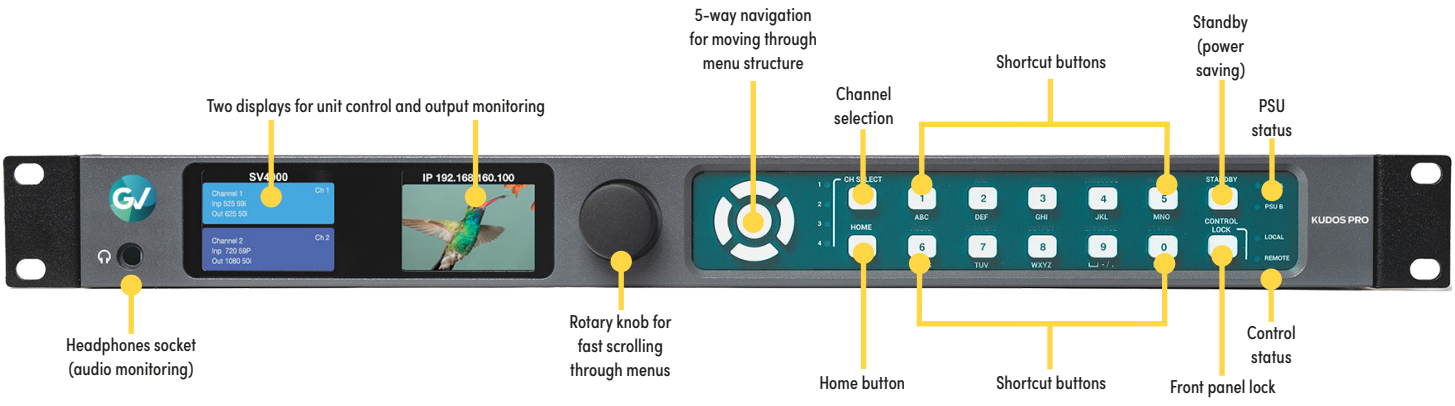
Optional Features

- Fiber input/output

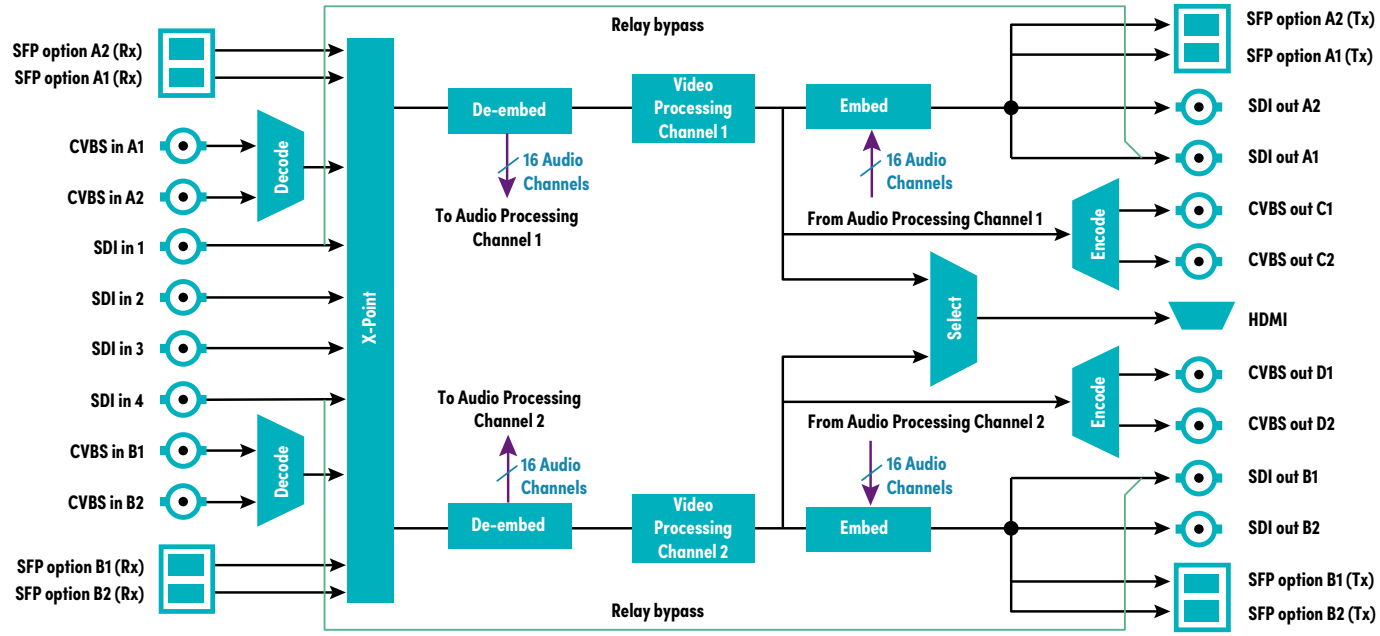
Applications

- Integration of SD programming into HD schedules
- Supporting legacy SD channels with HD produced content

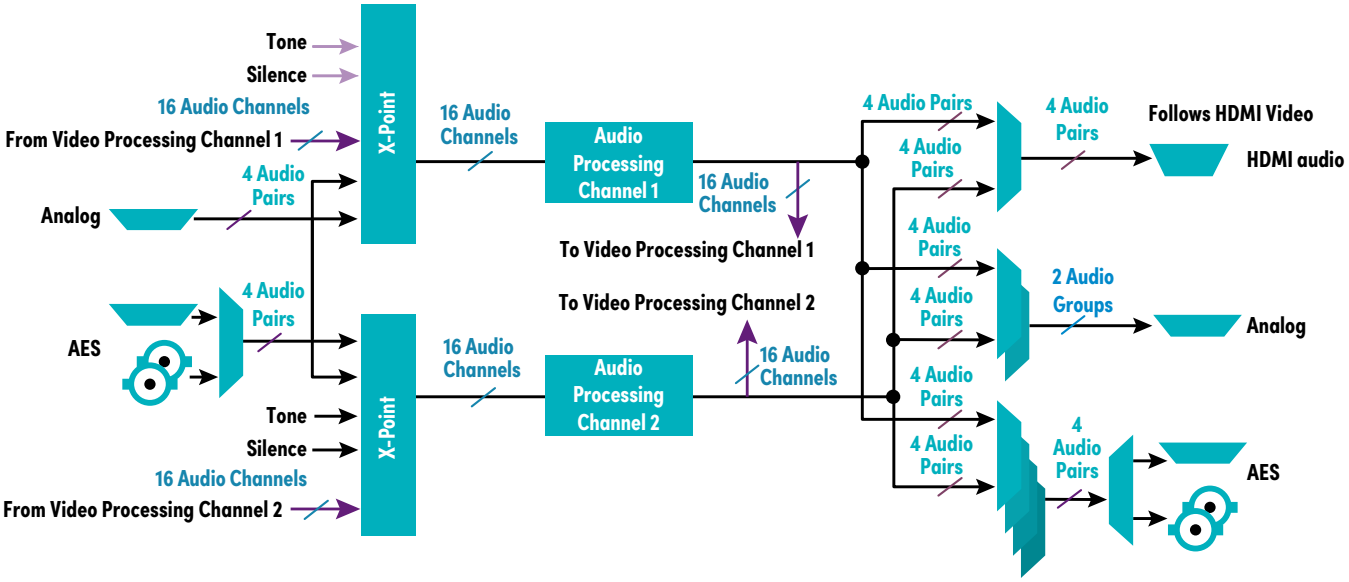
SV2000/4000 Front Panel



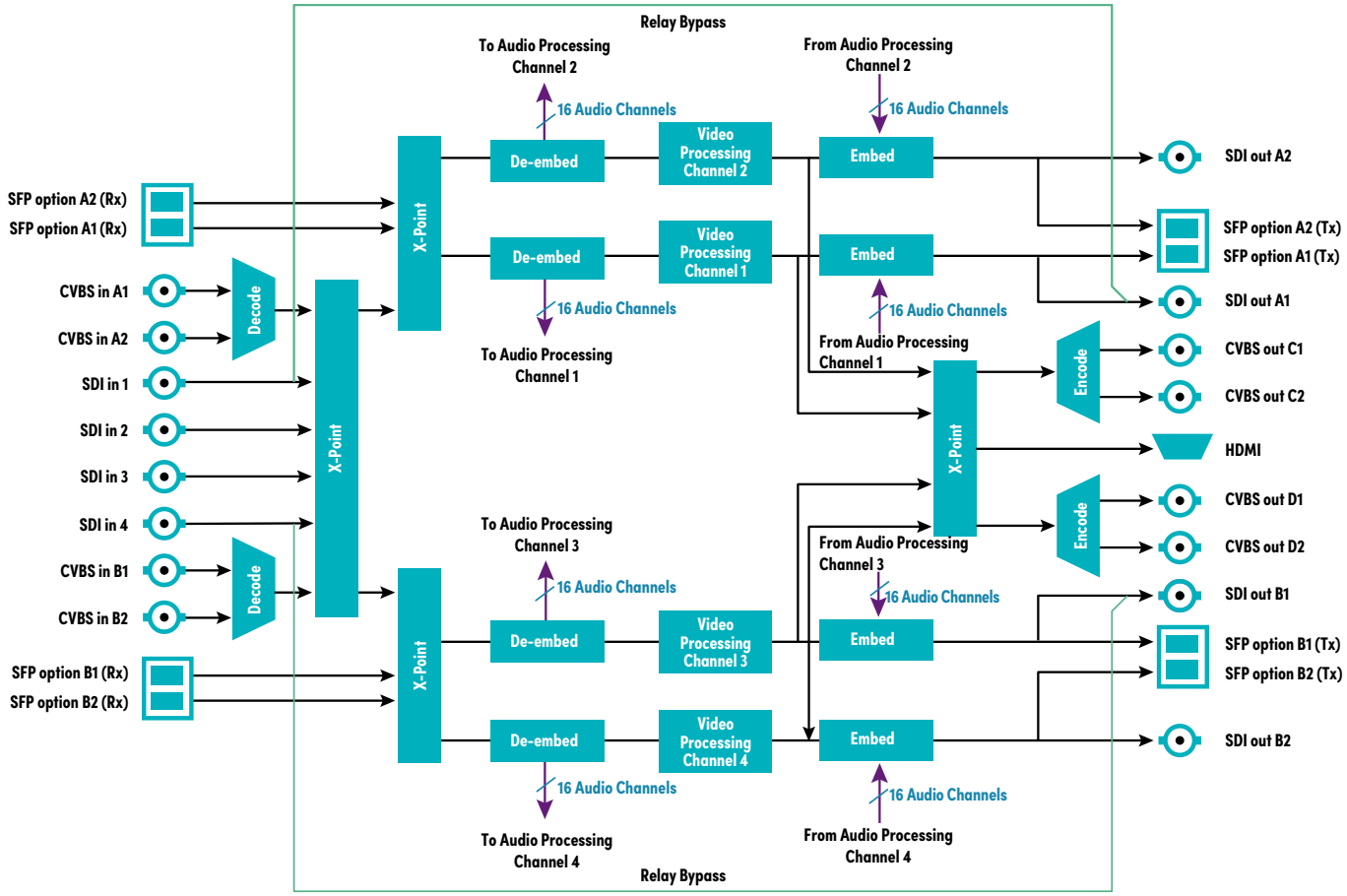
SV2000 Video Processing



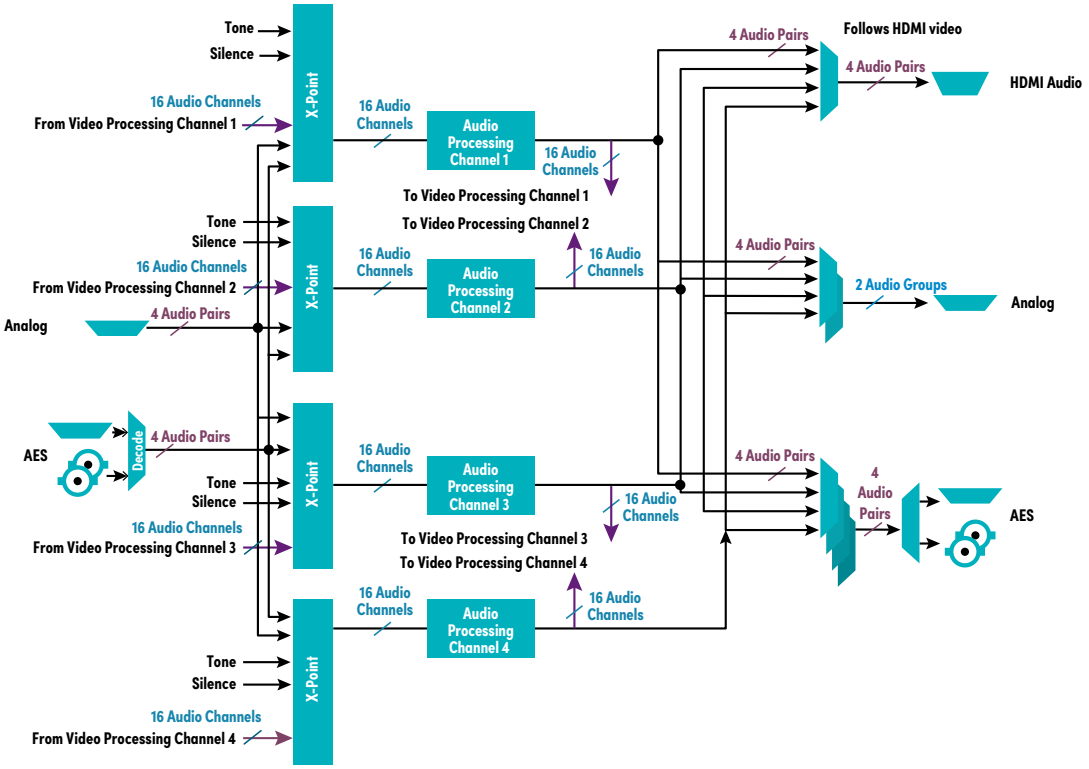
SV2000 Audio Processing



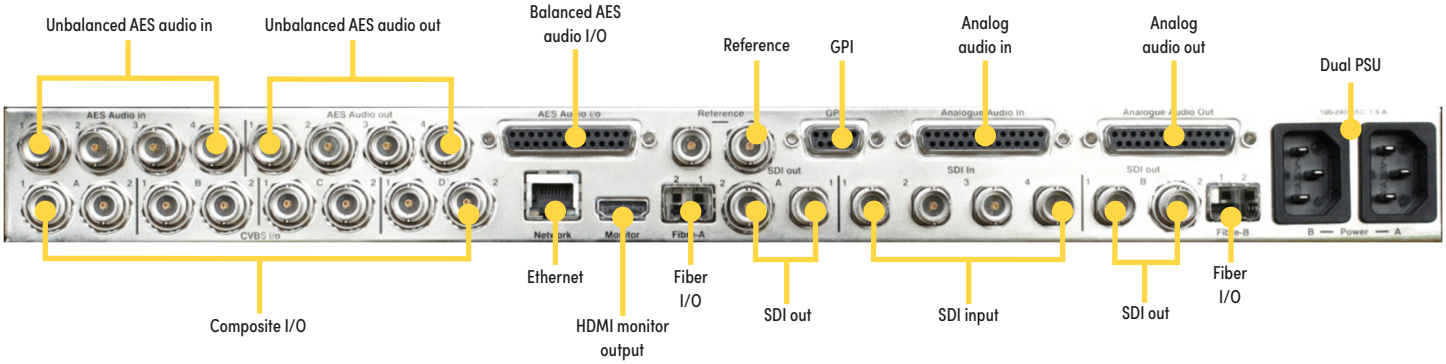
SV4000 Video Processing



SV4000 Audio Processing



LC2000/4000 Rear Panel



Specifications

Signal Inputs

Serial digital 4x 75Ω SD/HD/3G serial digital with embedded audio

Input standards:

- 3 Gb/s SD-SDI, SMPTE ST 425 level A, level B
- 1.5 Gb/s HD-SDI SMPTE ST 292/SMPTE ST 299
- 270 Mb/s SD-SDI SMPTE ST 259

Composite PAL, NTSC, NTSC-J, PAL-M, PAL-N, N4.4, SECAM

12-bit ADCs

Analog component YC

Reference: 1x loop-through HDTV Tri-sync/SD Bi-sync (blackburst) SMPTE ST 240/SMPTE ST 274

Audio AES:

- 4x balanced AES inputs – via 25-way D-type
- 4x unbalanced AES inputs – via 4x BNC

Audio analog: 4x stereo analog inputs via 25-way D-type

Signal Outputs

Serial digital 4x 75Ω SD/HD/3G serial digital with embedded audio

Output standards:

- 1.5 Gb/s HD-SDI SMPTE ST 292/SMPTE ST 299
- 270 Mb/s SD-SDI SMPTE ST 259

Composite PAL, NTSC, NTSC-J, PAL-M, PAL-N

12-bit DACs

Analog component YC

Audio AES:

- 4x balanced AES outputs – via 25-way D-type
- 4x unbalanced AES outputs – via 4x BNC

Audio analog: 2x stereo analog outputs via 25-way D-type

Input Standards

(auto detect) 525, 625

720 50/59.94/60p

1080 50/59.94/60i

1080 50/59.94/60p (Levels A and B)

720/1080 23.98/24/25/29/30p

1080 23.98/24/25/29.97/30PsF, with film detection and processing

2160 23/24/25/29/30p (6G-SDI single-link, Level B dual stream)

2160 50/59.94/60p (12G-SDI single link Level A)

Output Standards

525, 625

720 50/59.94/60p

1080 50/59.94/60i

1080 50/59.94/60p (Levels A and B)

720/1080 23.98/24/25/29/30p

1080 23.98/24/25/29.97/30PsF, with film detection and processing

Conversion Functions

Modes:

SD/HD/3G up/down/crossconversion at the same frame rate

Frame synchronizer

Manual or Automatic ARC

AFD (SMPTE ST 2016), VI (RP186), WSS (L23)

SD input format: Normal 4:3, Anamorphic 16:9, Letterbox 14:9, Letterbox 16:9

SD output format: Normal 4:3, Anamorphic 16:9, Letterbox 14:9, Letterbox 16:9

Auto zoom: On/Off

Manual zoom: Zoom ±20%

Safe area marker: Off, 16:9, 4:3

Manual controls: size, aspect, pan, tilt

Wide range of ARC presets including 702 sample line mode

Audio Functions

Analog Audio:

- Four pairs of analog inputs are individually available to any or all processing channels
- Two groups (2 pairs) of analog output are separately assignable to any processing channel
- Headroom +24 dBu; balanced connection

AES Audio:

- Four AES audio inputs are individually available to any or all processing channels
- Four AES audio outputs (48 kHz) are separately assignable to any processing channel
- AES input is auto-detected as PCM (32-96 kHz) or non-PCM (48 kHz locked to relevant video input)

Embedded Audio:

- Each processing channel includes 16-channel embedded audio processing
- PCM audio processing includes channel level gain and delay compensation, as well as channel level routing/shuffle with audio phase inversion
- Non-PCM processing features pair level routing and delay compensation

Specifications

Metadata

Closed caption CEA608 <> CEA708

Timecode conversions

WST/SMPTE RDD08/SMPTE ST 2031 conversion

Enhancement

Advanced Horizontal Enhancement:

- Frequency band selection (Low, Med, High)
- 4 preset enhancement levels (Low, Med, High, Super)
- Custom H Gain and H Noise rejection levels

Advanced Vertical Enhancement:

- Frequency band selection (Low, Med, High)
- 5 preset enhancement levels (Soft 2, Soft 1, Normal, Sharp 1, Sharp 2)

Horizontal Aperture:

- 5 preset H sharpness levels (Low 2, Low 1, Normal, High 1, High 2)
- 5 preset H detail levels (Soft 2, Soft 1, Normal, Sharp 1, Sharp 2)

Noise reduction: spatial, recursive

Y/C alignment: corrects for up-stream lum chroma displacement

System

Pattern Off, Black, Ramp, Bars

Proc amp:

Black Level: +100 to -100 mV (0) in 0.8 mV steps

Contrast: -6 dB to +6 dB (0) in 0.2 dB steps

Saturation: -6 dB to +6 dB (0) in 0.2 dB steps

Y Gamma: 0.4 to 1.7 (1) in 0.1 steps

Freeze: On/Off

Genlock: Reference lock, Input lock (same format), Follow input (same frame rate), Free run

Memories: 16 user memories

Legalizer

EDH support

Communications

Remote control via GV Orbit and SNMP

Power (Primary and Secondary)

Input voltage range: 100 – 240 VAC, 50/60 Hz 1.5A (max.) via three-pin IEC power socket

Mechanical

Temperature range: 0 to 45° C (32° to 113° F) operating

Cooling: Internal fan, side venting

Weight: Approximately 4.25 kg (9.4 lbs.)

Case type: 1 RU, rack mounting

Dimensions: 44 x 430 x 400 mm (1.7 x 16.9 x 15.7 in.) (HxWxD)

Headphones socket with volume control

GPIO: 8 available

Throughput Delay

Video processing delay:

- **Field = 16.7 or 20 ms**
- **Frame = 33.3 or 40 ms**

With scaling active in same frame rate:

- Ref lock/Free run – Between 3 and 5 fields + ~200 µs
- Input lock (SDI) – 3 fields + 1ms

With same standard in & out and sync mode = Enabled:

- Ref lock/Free run – Between ~200 µs and 1 frame + ~200 µs
- Input lock (SDI) – ~1 ms

Frame-rate conversion: Any lock mode – 110 ms typical

Audio processing delay: (Audio delay = 0 ms)

With scaling active in same frame rate:

- Ref lock/free run – 1.5 frames
- Input lock – 1 frame + 1 ms

With same standard in & out and sync mode = Enabled:

- Ref lock/free run – 0.5 frames
- Input lock – ~3 ms

Frame-rate conversion: Any lock mode – 110 ms typical

Ordering

6112110

SV2000-CT2 Dual channel video & audio processing unit, including format conversion, frame synchronization, ARC control, noise reduction, side-bar keying, logo insertion, CC, WST and timecode handling, picture enhancement tools, 16-channel audio processing including gain, delay & shuffling. SDI (BNC or fiber), CVBS, GPI, AES and analog audio I/O. HDMI monitor output & dual PSUs.

6114110

SV4000-CT2 Quad channel video & audio processing unit, including format conversion, frame synchronization, ARC control, noise reduction, side-bar keying, logo insertion, CC, WST and timecode handling, picture enhancement tools, 16-channel audio processing including gain, delay & shuffling. SDI (BNC or fiber), CVBS for 2 channels, GPI, AES and analog audio I/O. HDMI monitor output & dual PSUs.

Fiber SFP Options for Fiber — A&B

FC1-13TR

Transceiver 1310 nm/Rx

FC1-13T1

Single 1310 nm Tx

FC1-13T2

Dual 1310 nm Tx

FC1-R1

Single Rx

FC1-R2

Dual Rx

FC1-HDBT2

HD-BNC Dual Tx

FC1-HDBR2

HD-BNC Dual Rx

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

This product may be protected by one or more patents. For further information, please visit: www.grassvalley.com/patents

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