![Grass Valley logo](GV Grass Valley)

DATASHEET

MC1000 & MC2000
Motion Compensated Frame-rate Converter

The MC1000 and MC2000 are high-quality, single- and dual-channel motion compensated frame-rate converters.

Key Features

- Motion compensated SD/HD/3G frame rate conversion
- Independent dual-channel conversion (MC2000 only)
- SD/HD/3G up/down/crossconversion
- Flexible video and audio I/O configuration
- 16-channel embedded audio processing for each video channel
- Continuous output when input standard switches
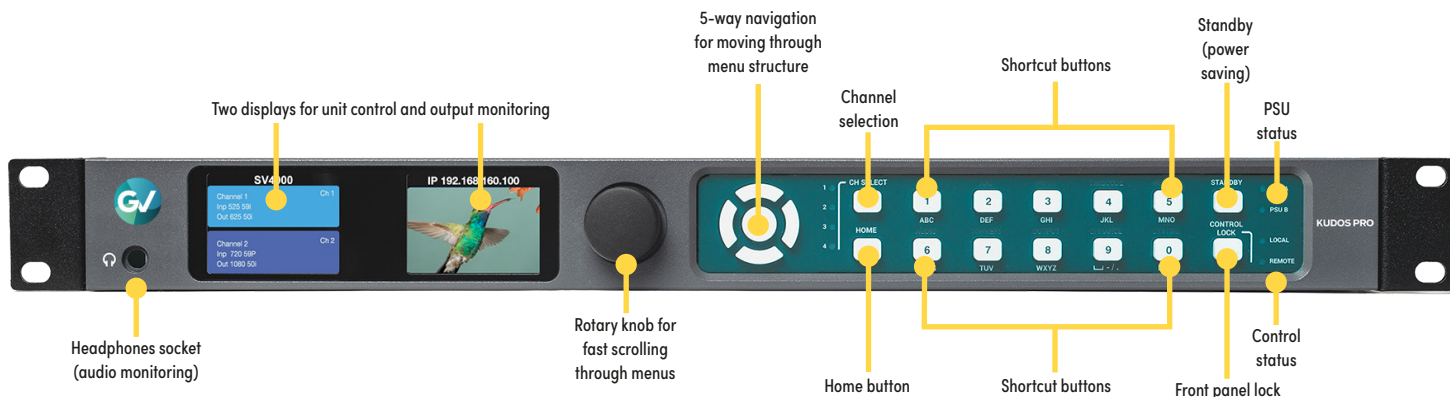- HDMI monitor output
- Dual PSU as standard

- Relay bypass on primary SDI inputs
- Automatic aspect ratio conversion (AFD, VI, L23)
- Powerful picture enhancement tools
- Front panel and remote control via web interface and GV Orbit
- Closed caption and timecode handling
- Synchronization
- User chosen line for SMPTE ST 2016
- GPI support
- Front panel control lock
- Caption generator

- Logo inserter
- Sidebar keyer
- Clean cut
- Composite input/output
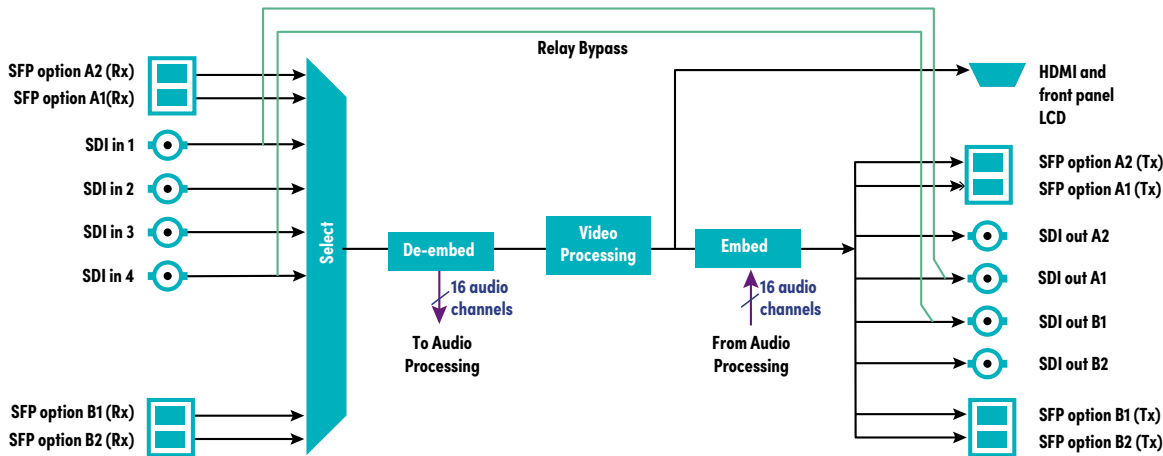- Fiber input/output

Applications

- International program distribution
- Content repurposing for internet, TV and Blu-ray distribution
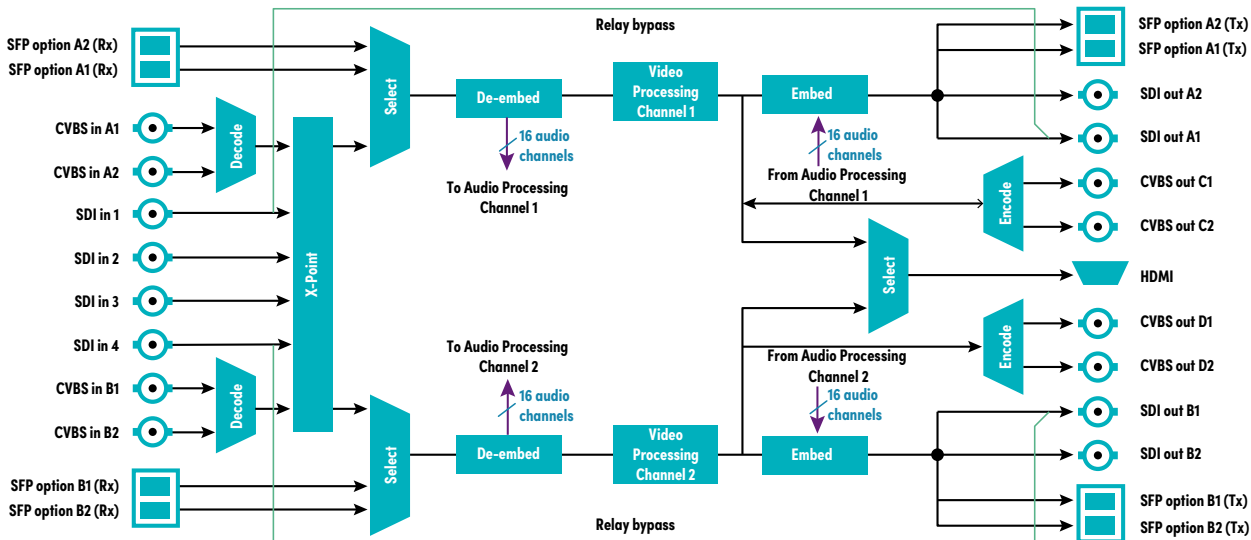- International TV and video production

MC1000/2000 Front Panel

5-way navigation for moving through menu structure

Standby (power saving)

Shortcut buttons

Channel selection

Two displays for unit control and output monitoring

PSU status

Headphones socket (audio monitoring)

Rotary knob for fast scrolling through menus

Home button

Shortcut buttons

Front panel lock

Control status

MC1000 Video Processing

MC2000 Video Processing

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: 1 x 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:

– 3 Gb/s HD-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, 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 23.98/24/25/29PsF

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

Output Standards
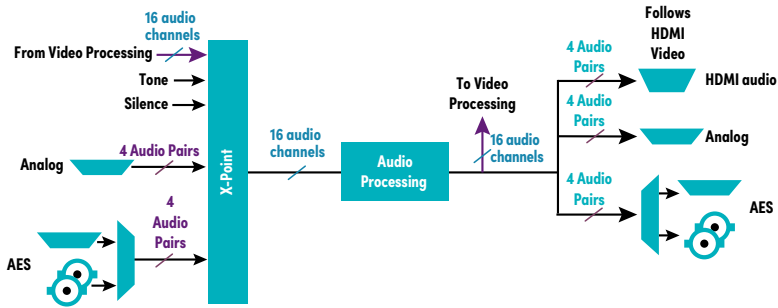
525, 625

720 50/59.94/60p

1080 50/59.94/60i

1080 50/59.94/60p (Levels A and B)
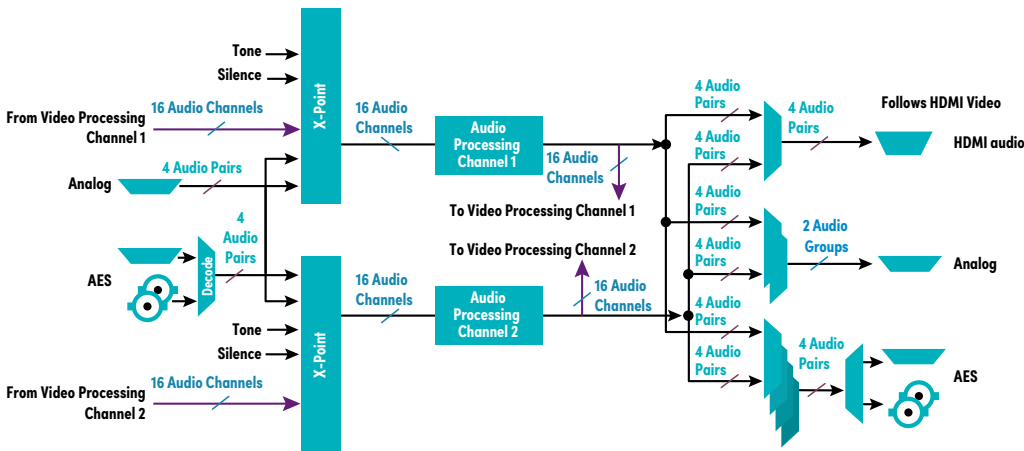
720/1080 23.98/24/25/29/30p

1080 23.98/24/25/29PsF

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

MC1000 Audio Processing

From Video Processing — 16 audio channels → X-Point
Tone →
Silence →
Analog — 4 Audio Pairs → X-Point
AES — 4 Audio Pairs → X-Point
X-Point — 16 audio channels → Audio Processing — 16 audio channels → To Video Processing
4 Audio Pairs → Follows HDMI Video — HDMI audio
4 Audio Pairs → Analog
4 Audio Pairs → AES

MC2000 Audio Processing

Tone →
Silence →
From Video Processing Channel 1 — 16 Audio Channels → X-Point
Analog — 4 Audio Pairs →
AES — 4 Audio Pairs → Decode
Tone →
Silence →
From Video Processing Channel 2 — 16 Audio Channels → X-Point
X-Point — 16 Audio Channels → Audio Processing Channel 1 — 16 Audio Channels → To Video Processing Channel 1
To Video Processing Channel 2
X-Point — 16 Audio Channels → Audio Processing Channel 2 — 16 Audio Channels
4 Audio Pairs → 4 Audio Pairs → Follows HDMI Video — HDMI audio
4 Audio Pairs →
4 Audio Pairs →
4 Audio Pairs → 2 Audio Groups → Analog
4 Audio Pairs →
4 Audio Pairs → 4 Audio Pairs → AES

Specifications (cont.)

Conversion Functions

Modes:

SD/HD/3G Linear/motion compensated frame rate

Conversion processing:

Still process: Detects still images and applies an aperture with full (progressive) vertical frequency response

Enhanced still: Adds field motion detection to still process. Prevents artifacts on moving repetitive patterns

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

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 (Soft 2, Soft 1, Normal, Sharp 1, Sharp 2)

Custom H Gain and H Noise rejection levels

Advanced Vertical Enhancement:

Frequency band selection (Low, Med, High)

5 preset enhancement levels (Soft, Normal, Sharp 1, Sharp 2, Sharp 3)
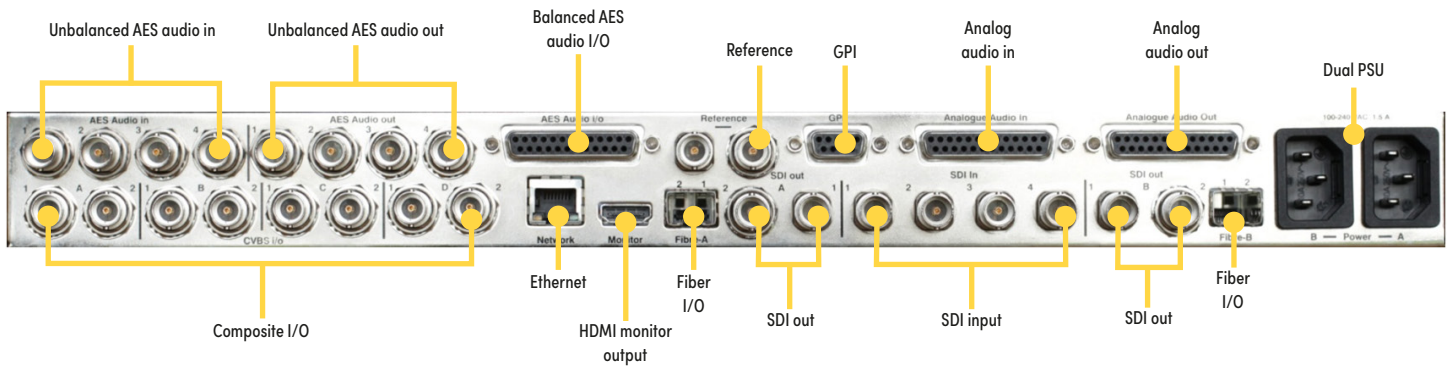
Horizontal Aperture:

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 luma chroma displacement

MC1000/2000 Rear Panel

Unbalanced AES audio in | Unbalanced AES audio out | Balanced AES audio I/O | Reference | GPI | Analog audio in | Analog audio out | Dual PSU

Composite I/O | Ethernet | HDMI monitor output | Fiber I/O | SDI out | SDI input | SDI out | Fiber I/O

Specifications (cont.)

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 web interface, 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

6132100

MC2000-CT2 Dual channel motion compensated frame-rate converter and adaptive format converter. Including frame synchronization, ARC control, noise reduction, side-bar keying, logo insertion, CC, WST and timecode handling, picture enhancement tools, 16-channel audio processing inc gain, delay & shuffling. SD, HD and 3G-SDI (BNC or fiber), CVBS, GPI, AES and analog audio I/O. HDMI monitor output & dual PSUs.

6131100

MC1000-CT1 Single channel motion compensated frame-rate converter and adaptive format converter. Including frame synchronization, ARC control, noise reduction, side-bar keying, logo insertion, CC, WST and timecode handling, picture enhancement tools, 16 channel audio processing inc gain, delay & shuffling. SD, HD and 3G-SDI (BNC or Fiber), CVBS, 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.

DS-PUB-3-1061A-EN

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