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A KRAMER ELECTRONICS COMPANY

# SP-14

Broadcast Grade HD & SD Multi−Format Motion−Compensated Frame Rate Converter & Broadcast Up/Down/Cross Converter

The SP−14 is a broadcast grade MEMC frame rate/standards converter. It accepts HD, SD & computer graphics signals, performs frame rate conversion, format conversion, frame synchronization, scan conversion and aspect ratio conversion as required, as well as embedded timecode processing and closed caption conversion. It is also applies powerful noise reduction & image enhancement to improve poor quality video.

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## FEATURES

- Frame Rate Conversion - Motion Estimation Motion Compensated (MEMC) conversion.
- Content Adaptive MEMC - Phase Plane Correlation and Block Matching Motion Estimation.
- Conversion Capabilities - Near−HD from SD up−conversion, SD to HD, HD to SD, HD to HD with support for CEA & SMPTE formats, scan converts computer VESA or CEA graphics with motion compensation, converts between all common broadcast and film frame rates.
- 3G HD-SDI, DVI/HDMI & Analog Signal Connectivity.
- Scene Cut Detection.
- Cadence-Aware MEMC - Preserves film−look by cadence conversion on scene−by−scene basis.
- Aspect Ratio Conversion & Pan/Zoom/Tilt/Trim.
- Broadcast Grade Performance - With 1024−tap scaling filter.
- Closed Caption Support - HD CEA708 & SD CEA608 formats.
- VITC/LTC Embedded Timecode Support - With automatic delay correction.
- Frame Synchronizer.
- Channel Logo Insertion.
- Audio Embed and De-Embed, Audio Delay Correction.
- Flexible Proc-Amp Controls.
- 2D Detail Enhancement - Sharpness control, Detail Enhance, Real−Time Unsharp Mask.
- De-Interlacer - Post−production/broadcast grade motion adaptive SD & HD de−interlacer with 3:2, 2:2 and non−standard/variable cadence detection.
- Noise Filtering and Reduction - Per pixel motion adaptive temporal/film noise filtering HD & SD, MPEG2 codec mosquito and block noise reduction for SD.
- AES & Embedded Audio In & Out.
- Built-In Test Pattern Generator.
- USB Port - For firmware upgrade.
- Control - Front panel controls with character LCD display, Web server for remote contol via TCP/IP, API−based remote control via RS−232 serial port or TCP/IP.
- Dual Redundant Power Supply - Two power feeds for critical applications, 100−264V AC.

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## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| INPUTS: | 2 SD/HD/3G HD−SDI on BNC connectors,<br>1 HDMI connectors,<br>1 DVI−D connector,<br>1 computer graphics (RGBHV & RGsB) on 5 BNC connectors,<br>2 CV (NTSC/PAL/SECAM) on BNC connectors,<br>1 s−Video (NTSC/PAL/SECAM) on 2 BNC connectors,<br>1 component video (YPbPr) on BNC connectors,<br>4 AES 48KHz digital audio pairs on BNC connectors. |
| GENLOCK INPUTS: | 1 SD/HD/3G HD−SDI with active loop,<br>1 analog bi−level or tri−level sync or black & burst with active loop. |
| OUTPUTS: | 1 SD/HD/3G HD−SDI on a BNC connector,<br>1 DVI−D connector,<br>1 component video (YPbPr) on BNC connectors,<br>4 AES 48KHz digital audio pairs on BNC connectors. |
| VIDEO I/O FORMATS: | Input and output: 480i, 576i, 720p23.98/24/25/29.97/30/50/59.94/60, 1080i50/59.94/60, 1080p23.97/24/25/30/50/59.94/60, 1080sfp23.97/24/25;<br>Input only: 2Kp23.97/24/25/30/50/59.94/60. |
| COMPUTER GRAPHICS INPUT FORMATS: | 640x480, 800x600, 852x480, 853x480, 1024x600, 1024x768, 1280x720, 1280x768, 1280x800, 1360x768, 1365x768, 1366x768, 1368x768, 1400x768, 1440x900, 1600x900, 1366x1024, 1400x1050, 1680x1050, 1600x1200, 1920x1080, 1920x1200, DVI/HDMI only 2048x1080. |
| CLOSED CAPTION & TIMECODE SUPPORT: | Composite, s−Video & YPbPr inputs: CC & VITC/embedded LTC for SD only;<br>YPbPr output: CC support only;<br>SD/HD/3G HD−SDI inputs & output: CC & VITC support, HD & SD. |
| SIGNAL PATHS: | 10−bit SD/HD/3G HD−SDI, 10−bit ADCs for composite, s−Video, 12−bit ADCs for component & VGA video, 8/10/12−bit HDMI, 8−bit DVI support. All video buses are 10 bit, internal processing up to 16 bit as required by each process. |
| OPERATING MODES: | MEMC Standards Conversions with image enhancement processing and filtering,<br>Motion Adaptive mode for format conversion without frame rate conversion,<br>Low latency mode with reduced processing. |
| OPERATING TEMPERATURE: | 0° to +40°C (32° to 104°F). |
| STORAGE TEMPERATURE: | −30° to +70°C (−22° to 158°F). |
| HUMIDITY: | 10% to 90%, RHL non−condensing. |
| DIMENSIONS: | 19" x 15.1" x 2U W, D, H, rack mountable with carrying handles (size includes handles). |
| WEIGHT: | 5.5kg (12.1lbs). |
| INCLUDED ACCESSORIES: | DVI−D cable, power cord, user manual/CD. |
| POWER: | Dual redundant integral PSUs, 100−240VAC 50/60Hz, via 2 IEC connectors. Can run on one or both PSUs, fan cooled for installation in equipment racks, separate PSU cooling for high reliability; front standby/on control key with switch−off time delay, selectable PSU failure indication. |