matrox MXO™

Portable broadcast-quality audio/video output for the Mac

Matrox MXO takes the DVI output from your Mac computer or laptop and converts it to broadcast-quality video. You can preview your Apple Final Cut Pro projects or the output of other QuickTime-based applications such as Apple Soundtrack Pro and Motion, as well as Adobe After Effects as they will actually appear on TV and record them frame accurately to tape – no drop frames, no repeat frames. You can also use Matrox MXO to provide flicker-free recording of Keynote and PowerPoint presentations, web browser sessions, and software application training.

Key features

- DVI to broadcast-quality video conversion in HD and SD
- Portable, hot-swappable external box
- Genlockable HD/SD SDI, HD/SD analog component, Y/C, and composite outputs
- Up to 8 channels SDI embedded audio output with stereo audio monitoring
- Flicker-free, broadcast-quality video output of your computer desktop with any application
- Workflow enhancements for Final Cut Pro and other QuickTime-based applications
  - Conversion of DVI preview output to frame accurate broadcast-quality video for insert editing and print-to-tape with guaranteed audio/video sync
  - Interlacing artifact elimination and gamma correction when previewing video on a secondary DVI display
  - Hardware accelerated output of DVCPRO HD, HDV, and Final Cut Pro Dynamic RT segments
  - Realtime downscaling of an HD project to SD resolution with proper color space conversions

Using Matrox MXO in “Mastering Mode” lets you enjoy artifact-free previews and is the easiest way to get video out of Final Cut Pro or other QuickTime-based applications when you’re looking for an alternative to FireWire. It offers many workflow enhancements that will improve your editing and content creation experience.

Frame accurate recording

Matrox MXO patent-pending technology takes the DVI preview output from your computer and converts it to frame accurate video for insert editing and print-to-tape with guaranteed audio/video sync. Normally when previewing video from a QuickTime application, the native YUV video is converted to the RGB color space for output over the DVI connection. The frame rate of the RGB video does not match the standard for broadcast video. For example, it may be 75 Hz rather than the 59.94 Hz standard for NTSC. The frame sequence, therefore, inevitably includes dropped and repeat frames. The Matrox MXO driver, on the other hand, takes video from the QuickTime application and sends it directly out over the DVI connection with time-stamping information that allows the MXO box to reconstruct the frame sequence at the broadcast standard frame rate. It also sends eight digital audio tracks that are then embedded in the SDI signal in perfect sync with the video. Simultaneous SDI and analog outputs in HD or SD let you view your project on a broadcast video monitor and record to tape at the same time. A third-party RS-422 adapter is required for deck control.

Full-screen previews without interlacing artifacts

If you use your desktop monitor for previewing video (i.e. Apple's Digital Cinema Mode [Apple Key (Command) + F12] in Final Cut Pro), Matrox MXO improves your experience in two ways. It provides high quality scaling of your video to match the native resolution of your display and it eliminates interlacing artifacts. You won't need to buy expensive HD monitoring equipment or the SDI-to-DVI converter required for preview with some I/O cards. In fact, MXO provides better HD video definition with pixel-to-pixel mapping on a flat panel (1920 x1200) than you will get on a more expensive professional HD monitor which is typically limited to approximately 800 lines of resolution. When scaling your video to full-screen to match the resolution of your display, MXO uses a special interpolation technique rather than simple line doubling to provide the best possible viewing experience without "jaggy" aliasing artifacts. If you preview interlaced video on your computer display, you've no doubt noticed tearing due to interlacing artifacts in the displayed image. The progressive display inherent in computer monitors is ideal for graphics, but when it comes to displaying interlaced video you see those annoying artifacts. Matrox MXO cleans up the signal so you enjoy artifact-free previews in 4:3 and 16:9. It also provides hardware gamma correction so you see the correct brightness on your screen. You can easily view your work to ensure proper aspect ratio, verify exact color temperature and safe-title area.

Realtime downscaling of an HD project to SD resolution

Matrox MXO features broadcast-quality NTSC and PAL output of downscaled HD projects so that you can use your SD monitor for preview and/or record an SD master of your HD project in real time. MXO provides proper conversion of the HD color space to the SD color space. The scaling is done in hardware, placing no burden on the CPU and GPU, so you have more processing power available for your application.

Hardware acceleration of Dynamic RT segments

In Dynamic RT editing mode, Final Cut Pro automatically reduces frame size to let you preview non-realtime segments of your project at a better frame rate. With the MXO hardware upscaler, these segments are accelerated to their original frame size, saving processing power for other Final Cut Pro operations.

Hardware acceleration of DVCPRO HD and HDV

Matrox MXO accelerates DVCPRO HD and HDV to full output resolution saving processing power for other operations.

Codec	Native resolution	Output resolution
DVCPRO HD NTSC	1280 x 1080	1920 x 1080
DVCPRO HD PAL	1440 x 1080	1920 x 1080
DVCPRO HD 720p	960 x 720	1280 x 720
HDV	1440 x 1080	1920 x 1080

Flicker-free video output of your computer desktop

In "Presentation Mode", Matrox MXO mirrors the contents of your secondary desktop and displays it as high quality SDI and analog video simultaneously. This mode can be used, for example, to record and display Keynote and PowerPoint presentations or web browser sessions. It can also be used to create software application training. MXO will downscale the desktop resolution to the video output format you select. If the desktop resolution is smaller than the video output format, it will be presented centered on the video output. A flicker reduction filter ensures solid, stable video output. The system's audio playback will be routed to the analog audio outputs and to one user-selectable stereo pair in the embedded SDI signal.

Specifications

DVI input
DVI-D digital single link – 29-pin female connector

DVI output
DVI-D digital single link – 29-pin female connector

Genlock
Bi-level sync, SMPTE 170M, ITU-R BT.470-5
or Tri-level sync, SMPTE 240M, 274M & 296M
BNC, 75 Ω terminated

SDTV video features
SDI output
SD-SDI with 8 channels of embedded digital audio, 24-bit 48 KHz
SMPTE 259M-C, SMPTE 272M
75 Ω BNC

Composite & Y/C outputs
NTSC-M or PAL B,D,G
75 Ω BNC
Frequency response: Y = 0.25 dB max to 5 MHz, C = 0.2 dB max to 1 MHz
2T pulse response = 0.5% max
Diff. Gain & Diff. Phase <2 %

Analog component output
Betacam 525 & SMPTE/EBU N10
75 Ω BNC
Frequency response: Y = -0.25 dB max to 5 MHz, PbPr = -0.2 dB max to 2 MHz
Component channel delay +/- 3 ns
Component S/N >56 dB (Y, Pb, Pr), unified weighted

HDTV video features
SDI output
HD-SDI with 8 channels of embedded digital audio, 24-bit 48 KHz
SMPTE 292M, SMPTE 299M
75 Ω BNC

Analog component output
SMPTE RP-160
75 Ω BNC
Frequency response: Y = -0.3 dB max to 28 MHz, PbPr = -0.4 dB max to 14 MHz
Component channel delay +/- 0.5 ns
Component S/N >57 dB (Y, Pb, Pr), unified weighted

Audio outputs
Stereo unbalanced analog audio, left/right RCA jacks

Other connections
USB 2.0, high speed, series B connector
DC Power jack, 0.25 mm

Dimensions
4.50" [L] x 6.35" [W] x 1.75" [H]
(114 mm x 161 mm x 44 mm)

External AC-DC adapter
100-240 VAC 50-60 Hz

Power consumption
10 watts

Regulatory compliance
FCC Class A, CE Mark Class A
RoHS compliant as per 2002/95/EC

Environmental specifications
Ambient operating temperature: 0 to 40 degrees C
Operating humidity: 20 to 80% relative humidity (non-condensing)
Operating altitude: up to 3,000 meters

Accessories
MXO cable – DVI and system audio loop-through, 1 meter
External AC-DC adapter
Power cord
Y/C video adapter

www.matrox.com/video

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