matrox **MXO**™

A must-have for Final Cut Pro users!
Portable, broadcast-quality audio/video output for the Mac

Matrox MXO connects to your Mac computer or laptop to provide broadcast-quality audio/video output. You can view 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 with perfect a/v sync – no drop frames, no repeat frames. Other cool features that save you time and streamline your editing workflow include realtime HD to SD downscaling, and hardware acceleration of DVCPROHD, HDV, and Dynamic RT segments to full output resolution so Final Cut Pro can do more for you in real time. As an added bonus, Matrox MXO also provides flicker-free output of your computer desktop so you can easily broadcast and record Keynote and PowerPoint presentations, web browser sessions, and software application training.

Matrox MXO is a cost-effective external box that's easy-to-use and portable. It will save you so much time, you'll wonder how you ever worked without it!

Key features

- Frame accurate, broadcast-quality audio/video output in HD and SD with guaranteed a/v sync
- Universal compatibility – designed to run on both Intel- and PowerPC-based Mac computers and laptops
- Portable, hot-swappable external box
- Realtime downscaling of HD projects to SD resolution with proper color space conversions
- Inexpensive HD and SD monitoring – interlacing artifact elimination and gamma correction when previewing video on a Cinema Display or other DVI monitor

- Hardware acceleration of DVCPRO HD, HDV, and Final Cut Pro Dynamic RT segments to full output resolution to save processing power for other operations
- Genlockable HD/SD SDI, HD/SD analog component, Y/C, and composite outputs with up to 8 channels SDI embedded audio output and stereo audio monitoring
- Flicker-free, broadcast-quality video output of your computer desktop with any application

"Mastering Mode" workflow enhancements for Final Cut Pro and other QuickTime applications

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 uses the DVI port on your Mac computer in a unique way to provide frame-accurate audio/video output for insert editing and print-to-tape with guaranteed a/v sync. Normally when previewing video from a QuickTime application, the native YCbCr video (sometimes inaccurately called "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 the YCbCr 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.

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 to 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.

Inexpensive HD and SD monitoring – 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 and verify exact color temperature.

Hardware acceleration of DVCPRO HD and HDV to full output resolution – Matrox MXO accelerates DVCPRO HD and HDV to full output resolution saving processing power for other operations so you get better realtime performance from your digital content creation applications.

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

Hardware acceleration of Dynamic RT segments to original frame size – 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, so you get better realtime performance.

Mastering Mode editing resolutions

HD	
DVCPRO HD 720p 23.98 (59.94 output)	HDV 1080i 29.97
DVCPRO HD 720p 59.94	HDV 1080i 25
DVCPRO HD 1080i 29.97	HDTV 1080i 29.97
DVCPRO HD 1080i 25	HDTV 1080i 25
HDV 720p 29.97 (59.94 output)	

NTSC	PAL
NTSC DV	PAL DV
NTSC DV50	PAL DV50
NTSC DVCPRO	PAL DVCPRO

"Presentation Mode" for 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, display, or broadcast 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 all stereo pairs in the embedded SDI signal.

Specifications

General
Universal compatibility
Intel- and PowerPC-based computers and laptops

Video standards
NTSC, PAL, NTSC-EIAJ, 1080i, 720p

Regulatory compliance
FCC Class A, CE Mark Class A, C-Tick Mark, VCCI
RoHS Directive 2002/95/EC

Dimensions
134mm (L) × 161mm (W) × 45mm (H)

External AC/DC adapter
100-240 VAC 50-60 Hz
Input: IEC320-C8 inlet
Output: +5V DC, 3A max., 2.5mm barrel type
Dimensions: 95mm (L) × 54mm (W) × 32mm (H)

Total power consumption
10 watts

Connections
DVI input and output
DVI-I (single-link) 29-pin female connector

Genlock reference input
SD analog black burst (bi-level) or HD tri-level sync
BNC connector (75 Ω), terminated

SDTV SDI output
SD-SDI with 8 channels of embedded SDI audio
24-bit, 48 kHz
BNC connector (75 Ω)
Compliant with SMPTE 259M-C, SMPTE 272M

SDTV S-Video & composite video output
PAL, NTSC, NTSC-EIAJ
Frequency response: +/- 0.25 dB max to 5 MHz
2T pulse response: 0.5% max
Diff. Gain and Diff. Phase: < 2%
BNC connectors (75 Ω)

SDTV analog component video output
Betacam, Betacam SP (NTSC & NTSC-EIAJ)
SMPTE/EBU N10 (PAL)
Frequency response Y: +/- 0.25 dB max to 5 MHz
Frequency response Pb, Pr: +/-0.2 dB max to 2 MHz
Component channel delay: +/- 3 ns
Component S/N (Y, Pb, Pr): > 54 dB,
unified weighted
BNC connectors (75 Ω)

HDTV SDI output
HD-SDI with 8 channels of embedded SDI audio
24-bit, 48 kHz
Compliant with SMPTE 292M, SMPTE 299M
BNC connector (75 Ω)

HDTV analog component video output
Supported video formats:
1080i 50, 1080i 59.94, 720p 59.94
Compliant to EIA-770.3
Frequency response Y: +/- 0.3 dB max to 28 MHz
Frequency response Pb, Pr: +/- 0.4 dB max to 14 MHz
Component channel delay: +/- 0.5 ns
Component S/N (Y, Pb, Pr): > 57 dB,
unified weighted
BNC connectors (75 Ω)

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

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Digital Video Solutions