



madVR Envy

**Improving Slow HDMI Sync Times
with the madVR Envy Extreme MK2**

See also: <https://madvrenvy.com/video/shorten-hdmi-times>

Introduction

A common challenge found in many of today's high-end home theaters and media rooms is noticeably slow HDMI handshake times, which can disrupt the viewing experience. These disruptions result from the way HDMI synchronization occurs across the signal chain. This document explores the factors contributing to these delays and approaches to improving the viewing experience. You can also learn more in [this video](#).

Understanding Long HDMI Sync Times

In high-end home theaters and premium video wall installations, long HDMI handshakes can occur when components in the signal chain resynchronize after a change in signal's frame rate, resolution, or color space. Frame rate changes—such as transitioning from a media player's UI at 60p to a movie at 24p—are usually the primary cause of long delays and disruptions, although such delays can also occur when switching between sources that use different frame rates.

For instance, Kaleidescape recommends setting its UI at 60p to ensure fluid animations and smooth menu navigation. While this enhances the user experience, it also creates a challenge—since nearly all movies are filmed at 24p, every time a user starts or stops a movie, the frame rate must switch between 60p and 24p, causing longer HDMI handshakes. These interruptions diminish the viewing experience and may raise questions from the customer about the integrator's implementation or equipment selection, even though the issue is related to HDMI signal processing and synchronization.

Some integrators attempt to mitigate HDMI sync delays by setting their media player UI to 24p instead of 60p to avoid the frame rate change. However, this sacrifices UI smoothness, leading to noticeable judder and stuttering—especially in animations like Kaleidescape's shuffling cover art.

Likewise, some integrators will set the Kaleidescape to output movies at 60p to keep the UI and movie at the same frame rate, avoiding the slow HDMI resync. However, this is not the best choice because it causes the player to apply "3:2 pulldown", a process that converts 24p content to 60p by unevenly repeating frames. This results in the movie having a jittery, uneven look. These challenges are not unique to Kaleidescape, as all media players, such as Apple TV, are designed for UI responsiveness at higher frame rates, leaving integrators in a difficult position when balancing that with HDMI sync times.

The madVR Envy Extreme MK2 Solution

The madVR Envy Extreme MK2 minimizes these delays by using MotionAI to lock the display at a user-selected refresh rate (48p, 50p, 60p, or 120p). This keeps UI and movie playback seamless without triggering disruptive frame rate resyncs.

Beyond reducing HDMI sync times, MotionAI can also enhance motion clarity, providing a smoother, more immersive viewing experience. As the industry's first AI-driven motion interpolation technology in a dedicated video processor, MotionAI analyzes frames in real time to generate new frames with exceptional accuracy. It reduces motion blur and judder while preserving the cinematic feel or can greatly enhance clarity, detail and fluidity, depending on user preference.

For purists who prefer to maintain the full cinematic feel, MotionAI allows the entire system to remain locked at 24p while still keeping the UI navigation and animations looking silky-smooth. For example, you can configure the Kaleidescape to run its UI at 24p while MotionAI delivers the same look for the user interface

as with 60p. This way, the signal remains at 24p for the UI and movies, eliminating the frame rate change and the longer sync times that go along with it.

MotionAI can also subtly improve the fluidity of 24p content or apply higher strength motion handling for those who prefer an enhanced experience. For instance, MotionAI can interpolate frames up to 120p, delivering extreme clarity, detail, and reduced motion blur. This is particularly beneficial for sports, documentaries, and concerts filmed at 24p, where a more realistic look is often desired.

For those looking to minimize HDMI sync times without engaging MotionAI, the Envy can also lock a display at 120p and output 24p content at 120p by repeating each frame five times. This ensures a seamless experience that retains the authentic 24p look while helping to reduce frame rate-induced handshake delays. Used this way, the movie retains the full look of 24p while appearing more stable.

The Envy Extreme MK2 enables integrators to fine-tune the viewing experience to meet diverse client preferences—whether prioritizing the director’s intent or maximizing detail and immersion for an unparalleled visual impact, all while ensuring a locked, consistent output frame rate that minimizes HDMI sync times.

Additional Benefits

The Envy Extreme MK2 also offers an extensive suite of advanced features designed to simplify integration and elevate the entire viewing experience:

- Dynamic Tone Mapping (DTM) optimizes HDR scenes in real time, delivering best-in-class HDR performance.
- Non-linear stretch expands 16:9 and scope movies by reducing or eliminating black bars.
- AI upscaling boosts lower-resolution content up to 5K for Barco CinemaScope displays and 8K.
- Automatic aspect ratio handling eliminates the need for lens memory, while Subtitle Management keeps subtitles on screen.
- Advanced image processing reduces artifacts and enhances detail for superior picture quality, while 1D and 3D LUT calibration enables reference-grade accuracy.

Award-Winning Innovation

Winner of Best in Show, Best in Class, and Editor’s Choice awards, the Envy Extreme MK2 is widely recognized for its innovative MotionAI technology and ability to reduce HDMI handshake delays, making it a top choice for high-end cinemas.

madVR Labs has also been recognized for its rapid growth, a testament to the increasing demand for its cutting-edge video processing solutions, securing a prestigious spot at 1,138 nationally and 77 in Consumer Products on the 2024 Inc. 5000 list of Fastest Growing Privately Held Companies in America. While these accolades are an honor, the company's focus remains on pushing the boundaries of video processing to deliver the ultimate viewing experience.

A Better Experience Awaits

Minimize HDMI handshake delays and enjoy seamless motion processing with the madVR Envy Extreme MK2. Learn more about how the madVR Envy Extreme MK2 can transform your home theater and media room experience at [madvrenvy.com](https://www.madvrenvy.com). For more information on shortening HDMI sync times, [watch this video](#).