



## White Paper

**Title:** *Using MadMapper for Image-Based Lighting and High Frame-Rate Control with Creamsource Vortex8 and ARRI SkyPanel X*

**Author:** Brian J. Macauto

**Company:** VFX Studios

**Contact:** [info@vfxstudios.com](mailto:info@vfxstudios.com) | [www.vfxstudios.com](http://www.vfxstudios.com)

**Date:** March 2025

## Executive Summary

This white paper outlines a professional workflow for configuring **MadMapper** to drive high-performance lighting fixtures like the **Creamsource Vortex8** and **ARRI SkyPanel X** for **image-based lighting (IBL)** and **high frame-rate control**. Through the use of Art-Net or sACN protocols, MadMapper can deliver pixel-level media content directly to LED lights in real-time, enabling dynamic, synchronized lighting environments ideal for virtual production, film, and broadcast.

## 1. Introduction

Image-Based Lighting and pixel-driven lighting workflows are reshaping modern film production. Advanced fixtures such as the Vortex8 and SkyPanel X now allow pixel-level control and high frame-rate refresh, enabling accurate reflections, lighting transitions, and realistic ambient lighting. MadMapper's visual UI, media playback capabilities, and network protocols make it an ideal hub for driving these types of fixtures.



## 2. Requirements

### Software:

- MadMapper (v5.0 or higher recommended)
- Optional: DaVinci Resolve or After Effects (for content creation)
- Artnetominator (for network troubleshooting)

### Hardware:

- Mac or PC with a modern GPU
- Creamsource Vortex8 or ARRI SkyPanel X fixtures
- 1Gbps or 10Gbps Ethernet
- Art-Net/sACN-capable switch or node (if fixtures don't accept Art-Net directly)
- DMX-compatible lighting console (optional, for triggering cues or merging data)

## 3. Fixture and Network Setup

### Creamsource Vortex8:

1. Navigate to the fixture's menu and set **Control Mode** to `DMX Pixel Mapping` or `RGBW Pixel`.
2. Set a **static IP address** in the same range as your control machine (e.g., 10.0.0.x).
3. Enable **Art-Net** (or sACN) in the network settings.
4. Assign a **DMX Start Address** (e.g., 1, 512, 1024, depending on universe).
5. Choose **Universe Number(s)** – Vortex8 may use multiple universes if in extended pixel mode.
6. Set **DMX Frame Rate** to match the camera system or highest possible for HFR lighting (e.g., 120Hz, 360Hz, 1000Hz).
7. Confirm fixture is in **Direct Pixel Mode**, where each pixel responds to RGB/W data from Art-Net.

### ARRI SkyPanel X:

1. Set **DMX Mode** to `Extended RGBACL` or `Multi-Cell Mode` for pixel-level control.
2. Assign a **static IP address** and enable **Art-Net**.
3. Confirm **Universe Assignments** for each pixel group.
4. Use ARRI's web interface or DMX controller to verify patching.



## Using MadMapper for Image-Based Lighting

5. Adjust **Cell Grouping**, if needed, to reduce DMX load while maintaining visual fidelity.
6. Enable **High-Speed Mode** to minimize flicker on high frame rate cameras.

### Network:

- Use a **dedicated switch** that supports IGMP Snooping and QoS to prioritize Art-Net/sACN traffic.
- Disable DHCP and assign **static IPs** to all devices.
- Configure universes clearly (e.g., Universe 0 = fixtures 1–8, Universe 1 = fixtures 9–16).
- Use a direct Ethernet connection from the control system to the switch; avoid Wi-Fi.
- Use ArtNetominator or similar tools to validate DMX data flow.

## 4. MadMapper Configuration

### Pixel Mapping Setup:

1. Launch MadMapper and go to **Light Fixtures** tab.
2. Add new **DMX Fixtures**: Choose "Generic RGBW" or create a **Custom Fixture Profile** matching your fixture's channel layout.
3. For pixel arrays (e.g., Vortex8), match the layout to physical positioning — each pixel can be a square in the MadMapper UI.
4. Adjust scale, rotation, and offset of fixtures to mirror their actual orientation in the studio.

### Art-Net Output:

- Go to **Preferences > DMX Output**.
- Select **Art-Net** or **sACN** as the protocol.
- Choose the appropriate **Network Adapter** (e.g., Ethernet).
- Map **MadMapper Output Channels** to the correct **Universe/Start Address** combinations.
- Ensure that output is **enabled** and that DMX data is visible in your fixtures or via ArtNetominator.



### Media Mapping:

1. Import an HDRI image, animated loop, NDI stream, or pre-rendered video.
2. Drag media to the preview canvas and assign it to your pixel-mapped layout.
3. Set **Blend Modes**, **Color Space** (Linear or sRGB), and **Media Looping Options**.
4. Adjust resolution scaling to ensure proper mapping of light content across the entire fixture grid.
5. Use a **test pattern** (e.g., RGB color wipe or number grid) to verify patch accuracy.

### 5. High Frame-Rate Playback Optimization

- Use **lossless or lightly compressed** media formats like ProRes 422, ProRes 4444, or uncompressed AVI.
- Set MadMapper to **run at maximum frame rate** (Preferences > Display > Performance).
- Use **external control triggers** (OSC, MIDI, Timecode) for media cue precision.
- When syncing with camera systems, match **fixture refresh rate to camera shutter speed**.
- Disable any **background apps** and use **GPU acceleration** exclusively for MadMapper.
- Enable **real-time audio reactivity or time-synced playback** for synced lighting transitions.

### 6. Why Use MadMapper Instead of Unreal Engine for Image-Based Lighting?

While Unreal Engine supports DMX output via its DMX Plugin, MadMapper offers significant advantages:

#### 6.1 Separation of Rendering and Lighting

Unreal's DMX is tied to the engine's frame rate. Any frame drops in UE can cause lighting sync issues. MadMapper operates independently, ensuring stable lighting output even when UE is under load.

#### 6.2 Easier Pixel Mapping Workflow

UE requires manual patching and Control Rig logic. MadMapper provides a 2D visual interface, fast drag-and-drop layout, and real-time media preview, making it ideal for prototyping and creative



workflows.

## 6.3 Content Flexibility

Unreal only outputs what it renders. MadMapper can play back HDRIs, NDI feeds, animations, and video files independently. This decouples lighting design from real-time scene rendering.

## 6.4 High Frame-Rate Sync

MadMapper outputs consistent DMX data, supporting fixtures with refresh rates of 1000Hz+ like Vortex8. Unreal DMX is limited by engine frame timing, making it less reliable for high-speed lighting.

## 6.5 Broader Compatibility

MadMapper supports Art-Net, sACN, MIDI, OSC, and timecode. It works with virtually any fixture, media type, or control protocol, unlike UE's more limited DMX implementation.

## 7. Color Accuracy and Calibration

- Use calibrated HDRIs or DPs' reference frames for media
- Align MadMapper color space with fixture response (Linear, sRGB)
- Match camera white balance to lighting output
- Use color meters for measurement and correction when necessary
- Test a known white-point image across fixtures to fine-tune DMX color profiles

## 8. Troubleshooting

<b>Problem</b>	<b>Solution</b>
Fixtures not responding	Check IP, DMX mode, and universe assignment
Color mismatch	Ensure correct DMX mode and color channel order
Flicker on HFR	Increase fixture refresh rate and sync camera



## Using MadMapper for Image-Based Lighting

camera	shutter
Media lag	Use optimized video formats and dedicated GPU
Universe conflicts	Double-check universe IDs and ensure no overlap
Patch errors	Use test patterns or ArtNetominator to visualize data flow

### 9. Conclusion

MadMapper provides a stable, creative, and efficient solution for pixel-level lighting control in high-end production environments. When used to drive cutting-edge fixtures like the Creamsource Vortex8 or ARRI SkyPanel X, it allows DPs, lighting designers, and virtual production teams to deliver synchronized, color-accurate, and frame-precise lighting effects with minimal complexity.

By offloading lighting from Unreal Engine, teams can streamline their workflow, increase performance reliability, and unlock new creative possibilities through real-time media playback and dynamic lighting design.

### Contact

For consulting, setup, or custom configuration:

#### VFX Studios

✉ [info@vfxstudios.com](mailto:info@vfxstudios.com)

🌐 [www.vfxstudios.com](http://www.vfxstudios.com)

