



madVR Envy

Barco Setup Guide

www.madvrenvy.com

Revision 1.08

Introduction

Welcome to the Envy / Barco Setup Guide. Although setting up the Envy itself is often as simple as plugging in the HDMI cables and entering the projector's peak brightness, it is important that your projector be set optimally for use in conjunction with the Envy. This guide covers the recommended set up for Barco projectors when used with Envy.

Please make the Envy menu changes with “Base Settings” selected in the Profile Bar (at the bottom selection in each Envy menu) so the changes will be permanent. Otherwise, if you make changes when “Active Settings” is selected in the Profile Bar, the changes will only be temporary, unless you use the “Save to Base” option. For a better understanding of how settings in the Envy work, please see Introduction to Profiles guide at <http://www.madvrenvy.com/#resources>.

Once complete, please review the “Quick Sanity Check” section at the end of this document to confirm your configuration.

Configuration Steps

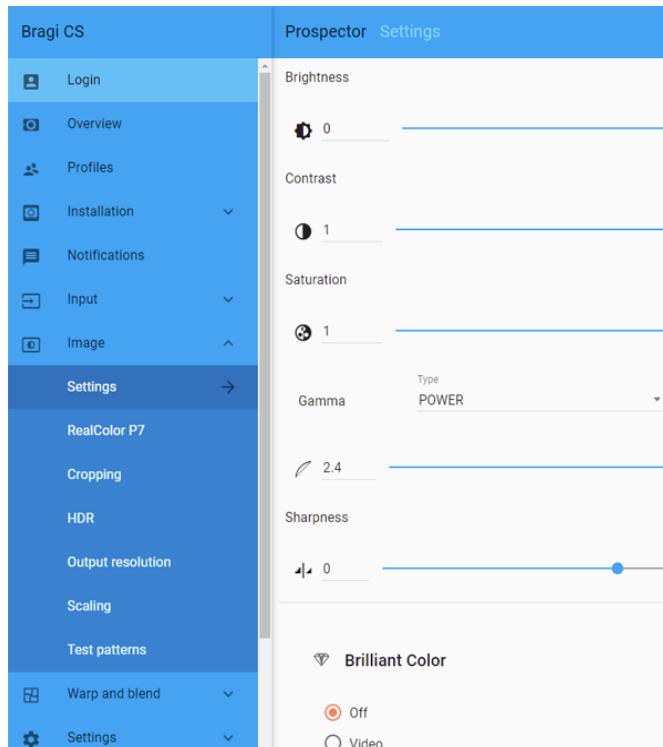
The following steps are required to best configure Barco projectors for use with the Envy.

1. First, we need to configure important settings in the Envy’s Display Configuration menu. Press the top-right button on the Envy remote to access this menu, then select “Base Settings” from the bottom of the menu. Then follow the steps below. An example of the completed settings is shown in the image on the next page.
 - A. **Resolution setting:** If not using a scope screen, set the “Resolution” to **3840 x 2160** and move ahead to the next step below. If using a scope screen with any of the Barco DCI projectors, such as the Freya or Nerthus, set the resolution to **4096 x 2160**, since these models use a 4096 x 2160 chip. If using a Barco CinemaScope model, consider setting the resolution to **5120 x 2160** (5K), and see the Advanced Settings section of this document. Otherwise use 3840 x 2160.
 - B. **Peak Luminance:** Set the Peak Luminance here. Peak Luminance is a measure of the brightest image your display achieves for a specific system configuration. This depends on several factors, including your display’s lumens, lens position, iris position, lamp/laser power mode, calibration settings, throw distance, and your screen size and gain.

The best way to determine your peak luminance is to display a 10% white pattern and measure it using 3rd party calibration software or a handheld lux meter. If measuring with calibration software, enter the “cd/m²” measurement as your nits value. If using a lux meter, you will need to convert the lux reading to nits or foot lamberts. If measuring with a 100% pattern, add 10% to the lux reading. If you have neither, the peak luminance can be roughly estimated.



- Using the Barco Prospector interface, under Image->Settings, set the following: Brightness 0, Contrast 1, Saturation 1, Gamma Type “Power” with a value of 2.4, Sharpness 0, and Brilliant Color (select models only) to Off. See the example shown on the next page.



- Next, we need to set some important values in the Envy Display Calibration menu. To access this menu, press the top-right button on the Envy remote, then press the right arrow once, then

select “Base Settings” from the bottom of the menu. Note: This step can be skipped if you will perform a 3D LUT calibration – see Step 8 for more information.

- a. If you will not use a 3D LUT, you must set the Envy Transfer Function value to 2.4, to match the Gamma value in the Barco, as configured step #2. If you used a different Gamma setting in the prior step, set that value in the Transfer Function here, rather than 2.4.
- b. If your Barco supports a gamut of up to DCI-P3, such as with the Bragi, Loki or Njord, set the Gamut to **DCI-P3**. If using a DCI model, such as the Freya or Nerthus, which has gamut coverage for BT2020, set the Gamut in the Envy to **BT2020**. If your projector does not support the DCI-P3 or BT2020 gamut, set the gamut in the Envy to **BT709**. Note: If you are performing a calibration with a 3D LUT, these settings will not be used, as the LUT will control the gamut automatically.

Please keep all other settings at their defaults, including the HDR Flag set to Off (this must be off, but do not worry, the Barco will still display HDR content). Shown below is an example setting for the Njord, which supports DCI-P3.



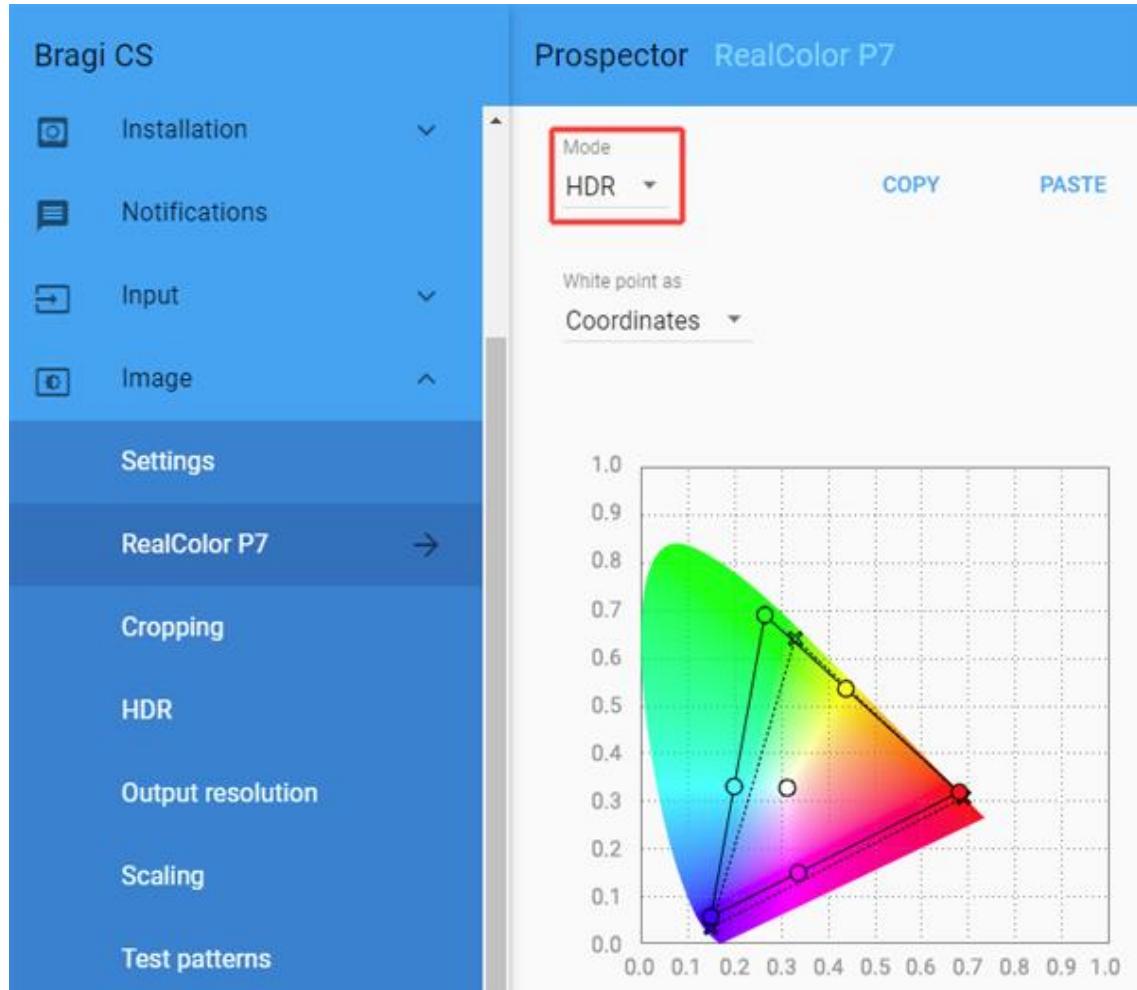
4. If not using a 3D LUT, select **Input->Connectors->HDMI** and change the “Color Primaries” from Auto to the Gamut value set in the Envy per step 3b. For instance, **DCI-P3-D65** or **BT.2020**. Shown below is the setting for the Njord, which uses DCI-P3.

Connector settings

Color space Auto	Signal range Auto	EDID 3840x1620@60Hz	Color primaries DCI-P3-D65
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- If your projector supports DCI-P3 or BT.2020 and you will not use a 3D LUT, select **Image->RealColor P7**, and set the mode to “HDR”, as shown on the next page.

Following steps 3, 4 and 5 will likely provide you with the highest color accuracy for out-of-the-box settings when a 3D LUT is not being used.



- Only if using a scope screen (a screen that has an aspect ratio of 1.85 or greater, such as 2.35 or 2.40 aspect ratio), follow these steps to set up the Envy screen aspect ratio control:
 - Go to Image->Cropping and set Cropping to “2.37:1”, regardless of your screen’s actual aspect ratio (e.g. do not use 2.39 if you have a 2.40 screen, etc.).
 - Go to Image->Scaling and make sure it is set to “Fill”.

- c. Play any 2.40 aspect ratio content and change the Barco Lens zoom so that the image perfectly fills your screen from left to right. Do not worry about any black bars on the top or bottom. Adjust the Barco's focus after changing the lens position.
- d. Play any 16:9 content and go to the Envy Screen Configuration menu (press the Envy menu button and then the arrow-right button three times). Change the Screen Boundaries setting to Custom, then ideally change Top and Bottom to 270, or whatever settings are needed for the top and bottom of the image to fit perfectly within the screen. Be sure to make these changes with Base Settings selected at the bottom of the menu.

For more detailed information about scope screen setup with Envy, see the Envy Scope Screen Setup Guide, available from www.madvrenvy.com/#downloads.

- 7. Optional: For improved color accuracy, it is recommended to perform an internal calibration of the projector's native color space values, using the Service->Native RealColorP7 setting, when logged in as the Barco "Power User", by following the procedure as set forth by Barco. This is recommended (as a first step) even if performing a 3D LUT. For more information, contact your Barco representative.
- 8. Optional: For the most accurate color, grayscale, and gamma tracking we recommend performing a 1D and 3D LUT. If you do so, please skip step 3 (Envy ignores those settings when a 3D LUT is active).
- 9. If a calibration is going to be performed it is recommended to perform the calibration in either 24hz or 60hz framerate. Specifically, we do not recommend calibrating with the Barco receiving a 48hz signal, even if you plan to use this frame rate with MotionAI (see Advanced Settings below). Otherwise, you will receive verification errors during your calibration.

Advanced Settings

After setup is complete you can take advantage of two unique features of the madVR Envy Extreme and Barco displays. These features include utilizing the 5120x2160 output resolution (only on Barco CS models) to provide additional resolution and clarity and utilizing Envy's MotionAI feature available in the Extreme models for use in conjunction with Barco's 48hz support. Although MotionAI can be run at 60hz with the Barco displays, 48hz will provide the best results and is supported by the Barco displays.

1. To enable support for 5120x2160 and or 48hz support, proceed to the **HDMI Configuration** page within the Envy Configuration Menu.
2. Select **EDID Override** under the **HDMI Output** section.
3. From within this menu select "Barco CS" if using a CS model Barco, or "Barco 4K" if the display is a non-CS model.
 - a. "Barco CS" enables 5120x2160 and 48hz support for Barco CS models.
 - b. Barco 4K enables 48hz support

- Save these changes to Base, and then **restart** the Envy. These changes will not take affect until after the Envy is restarted.



- Once the Envy is restarted, and if using the **Barco CS EDID** override, proceed to **Display Configuration** in the Envy menu and select **Resolution**. Change the Output Resolution to 5120x2160 and save changes to Base.

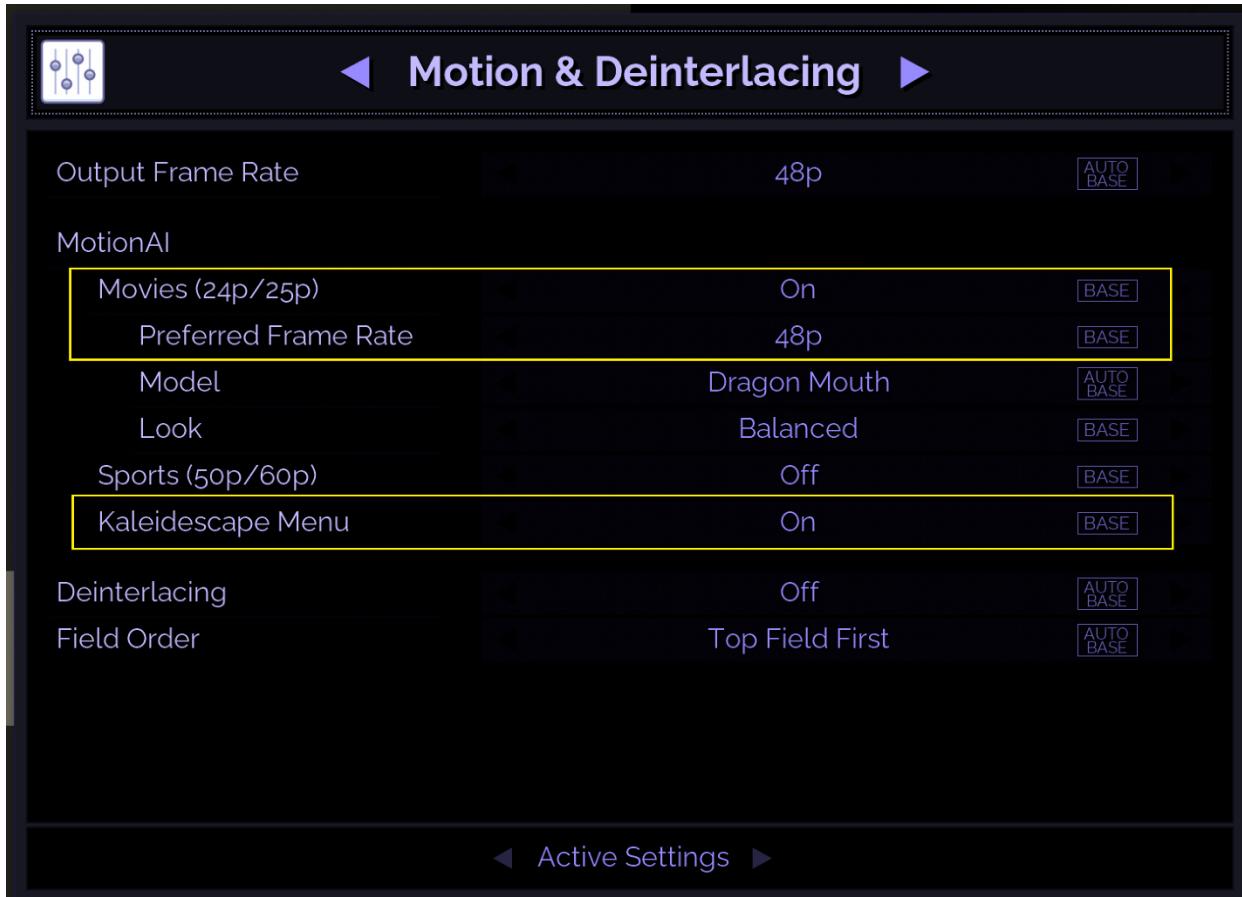
MotionAI Setup

MotionAI can reduce motion blur and judder for a more pleasing image, while still retaining the full cinematic look and preserving director's intent. Likewise, it can also be used to smooth motion to a stronger degree, introducing various amounts of soap opera effect, depending on the viewers taste.

To enable MotionAI, follow these steps. Remember to **save your changes to Base** when finished:

- Proceed to the **Motion & Deinterlacing** page in the Envy Settings Menu.
- Under **MotionAI** select **On for Movies (24p/25p)**.
- Select **Preferred Frame Rate** and select **48p**. Note you must first select the Barco CS or Barco 4K EDID and restart the Envy, per the instructions in the Advanced Settings in this guide.
- For the **Look**, select **Cinematic** if you wish to fully preserve director's intent. With this very low setting it may appear at first that there is no benefit. However, with an A/B comparison using the available modes for this in the Envy, you will see that it is actually quite beneficial, while still remaining fully cinematic. If stronger motion handling is desired, choose a different Look setting.
- Leave **Model** set to **Auto**.
- Note that **Sports (50p/60p)** requires the use of 100p and 120p, which are not supported currently with most Barco displays. Therefore, this should remain **Off**.

7. Set **Kaleidescape Menu** and to On. This way the Kaleidescape menu can be run at 24p but still remain silky smooth for the UI animations. The advantage is quicker HDMI switching between the Kaleidescape menu and movies, since the frame rate will always remain at 24p.



Quick Sanity Check

After completing the setup of the Envy with your Barco projector, we recommend reviewing the following checklist as a final “sanity check” to help ensure everything is set up optimally:

- Use the Prospector or Barco remote to make sure the projector shows the resolution selected in step A matches the value you selected in step 1A. In some cases, when first pairing the Envy with the Barco, the projector may connect at 1024x768. If this happens, please check step 1A and make sure the setting is changed in the Envy Base Settings and not Active Settings so that the setting is saved.

- B. Play any 4K HDR movie (except Gemini Man or Billy Lynn). Check the Envy **Incoming** Signal Menu (press OK on the Envy remote when no Envy menu is active, or press “i” on the Envy backlit remote) and make sure that the “Framerate” shows 23.976. If instead it shows 59.94, and you are using an Apple TV or Kaleidescape, then your source device(s) are not set up for proper playback – check our setup Apple TV and Kaleidescape guides on our website for more information. Or if you are using a different source device, check its settings and make sure it outputs in a “native” or “direct” mode.
- C. While playing the 4K HDR movie, check to make sure the “Transfer Function” on the Envy **Incoming** Signal shows “HDR”. If not, Envy is not receiving HDR from the source player. This could be caused by a “rogue” device in the HDMI chain, or if using an AVR like the Denon/Marantz, make sure it is set to use “Enhanced” HDMI, so that it outputs the full 18 Gbps bandwidth and is not restricted to 9 Gbps.
- D. While on the Envy Incoming Signal menu, press the right arrow once to access the **Outgoing** Signal Information. If not using MotionAI, make sure that the “Framerate” shown here matches the “Framerate” from the Incoming Signal Information menu (in this example, both should show 23.976). If using MotionAI, the Framerate should show as 48hz, assuming you configured the options as recommended in the MotionAI Setup section above.
- E. On the **Outgoing** Signal Information menu, make sure the Outgoing Transfer function shows “SDR” (note, on the other hand, that the Incoming signal should show HDR). This should always be the case with the Envy, even for HDR. This is because the Envy does the HDR processing and then outputs its signal as SDR (but still delivering an HDR image). Otherwise, if the Envy outputs the signal with the HDR flag, then the Barco projector will apply its own tone mapping on top of the Envy’s tone mapping, which will look bad due to double tone mapping. If this **Outgoing** “Transfer function” does show “HDR”, make sure the Envy HDR Flag is set to Off (see step 3).
- F. If the colors look undersaturated: If you are not using a 3D LUT, and using a projector that supports DCI-P3 or BT2020, make sure that the “**Colorimetry**” shown in the Envy Outgoing Signal Information menu matches the Gamut value set in step 3b, such as “DCI-P3” or “BT2020”, and make sure the setting described in step 4 also matches that same value. If not, please revisit those steps. If you are using a projector that does not support DCI-P3 or BT2020, then the Colorimetry should instead show “BT.709”.

Additional Resources

This concludes the Barco setup instructions. We recommend also reviewing the Envy Introduction to Profiles guide, MotionAI guide, and the setups guides for source devices such as Kaleidescape and Apple TV. This and other such resources are available at www.madvrenvy.com/#resources. Thank you and enjoy your Envy!