



madVR Envy

JVC Laser Projector Setup Guide

www.madvrenvy.com

Rev. 2.05

1.0 Introduction

Welcome to the madVR Envy Setup Guide for the JVC laser projectors. This guide shows how to configure your projector for SDR (Standard Dynamic Range) and HDR (High Dynamic Range) content, to get the best results from your Envy. This guide covers topics specific to using the JVC with the Envy. For general JVC setup information, please refer to the JVC Owner's Manual.

2.0 Projector Settings

These first sections will deal with configuring the proper settings on the Projector itself. After this, we will address the settings in the Envy.

2.0.1 Input Level and Color Space

First, we want to set the Input Level and Color Space for the projector. Having a defined setting most of the time is desirable, as there are cases when the projector will use an incorrect setting if on "auto", resulting in an inaccurate image. Set the Input level to "16-235 (Video)" and then set Color Space to "RGB".

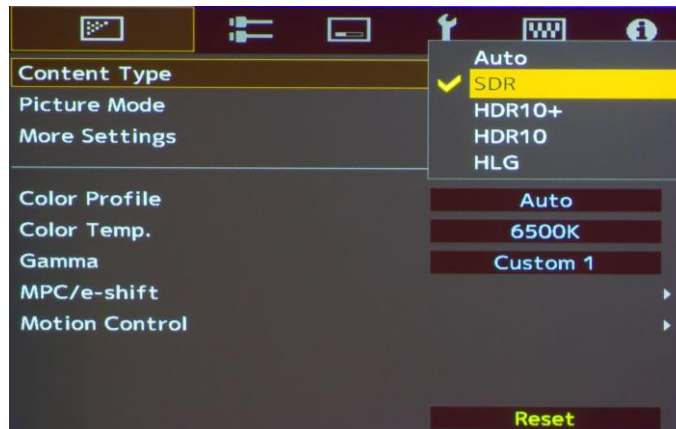


Note: Most video sources use 16-235, and 0-255 is mainly used with output from a computer. It is important to avoid a mismatch between the Source and the Display, so that black and white levels are correct.

2.0.2 Using the Same Picture Mode for SDR and HDR

If you wish to use the same light output for SDR and HDR content (e.g., the same laser level and lens aperture for both modes), you can use one picture mode simply by following the instructions in this section. This is common in setups with larger screens, when maximum brightness is desired regardless of SDR vs HDR content.

First, from the JVC main menu, set the Content Type to SDR, and **not Auto**, as shown here:



Lastly, we need to configure various other settings in this menu. We recommend setting Picture Mode to **“Natural”**, Color Profile to **Auto**, Color Temperature to **6500K**, and a Gamma to **2.4**. Other settings in this Picture Mode can be set to your preference (Laser Level, Dynamic Control, Aperture, etc.), like shown below:



2.0.3 Using Different Pictures Modes for SDR and HDR

If you wish to use different light output for SDR and HDR content (e.g., lower brightness for SDR and higher brightness for HDR), follow the instructions in this section. This is useful when the user feels that their HDR setup is too bright for viewing SDR content. There are two different approaches to having the JVC automatically switch to different settings for SDR and HDR, which are discussed next.

2.0.3.1 Approach 1: Using Envy's IP Control to Switch JVC Picture Modes

The Envy's built-in IP control can directly control other A/V gear on your network, such as AVRs and displays. This works even if you are not using any control system, such as Crestron or Control4, and is the recommended approach to automatically switching your JVC to different Picture Modes.

However, this approach requires that your JVC be connected to the same local network as your Envy. If you do not have a way to connect your JVC to your network, then please see Approach 2 in section 2.0.3.2 for an alternative way to switch Picture Modes.

Step 1: SDR Picture Mode Setup

Follow the steps in 2.0.2 to set the Picture Mode settings as desired for **SDR** content.

Step 2: HDR Picture Mode Setup

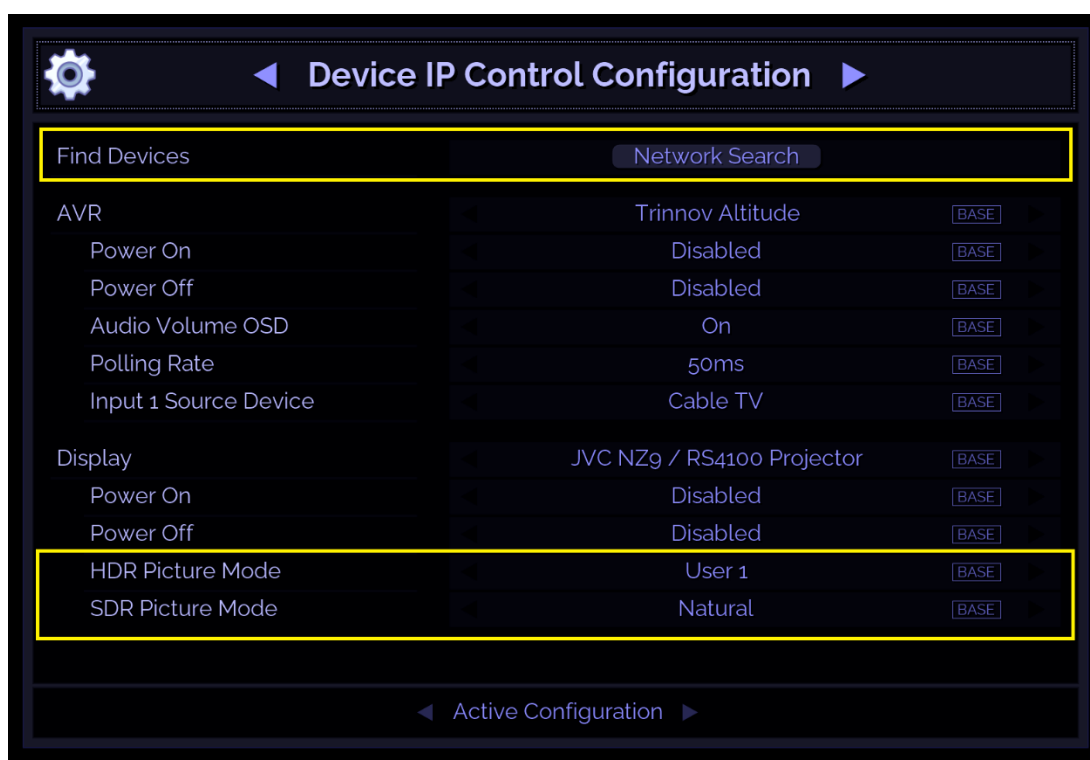
Follow the same steps in 2.0.2 again to set the Picture Mode settings for **HDR** content but save those settings in the JVC Picture Mode named **User 1** instead of Natural. The main difference between this Picture Mode and the one used for SDR would usually be the Laser Level and/or Aperture, if the goal is for greater brightness when viewing HDR content.

Step 3: Device IP Control Setup

So that the JVC will change picture modes when the signal changes between SDR and HDR, you must perform the following actions from the Envy's Device IP Control Configuration Menu:

1. You must be running the Envy Firmware version 1.9 or higher. Depending on when you are reading this guide, this may require you to set the Firmware Build Type to "Experimental" to access this update.
2. Make sure the JVC is connected to your local LAN and is using a static IP address, either as assigned in the JVC menu or using a DHCP reservation in your router.
3. Note or set the password in the JVC Network settings.
4. From the Envy Device IP Control Configuration Menu, choose Find Devices.
5. Under the Display section, select the JVC.

6. Select the Password option that appears and enter the same password in the JVC network settings. The rest of the Display options will then appear. If not, please double check your password.
7. Under the HDR Picture mode, select User 1, or whichever preset you selected in the HDR Picture Mode Setup above.
8. Under the SDR Picture mode, select Natural, or whichever preset you selected in the SDR Picture Mode setup above.
9. Highlight any of the menu line items tagged as “TEMP” and press the Green button to save these settings to your Base layer, as your Envy defaults.
10. The **next time** the Envy signal changes between SDR to HDR, the Envy will automatically instruct the JVC to change to the appropriate Picture Mode, as configured here.



2.0.3.2 Approach 2: Using the Envy HDR Flag to Switch JVC Picture Modes (Advanced)

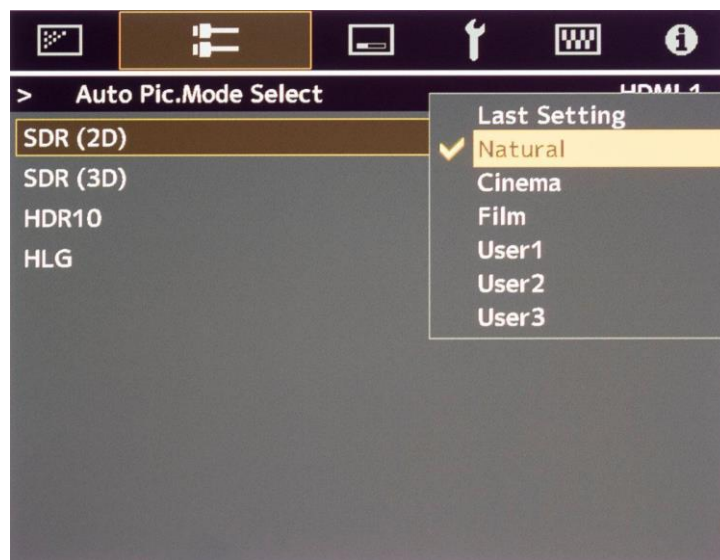
This approach uses the Envy HDR Flag to have the JVC automatically choose different Picture Modes for SDR and HDR. This approach requires a few more steps, but if you carefully make the changes itemized below, it will work fine. This method also uses the Envy’s HDR Flag, which will trigger the JVC to switch to the proper Picture Mode for the content being viewed.

Approach 1 in section 2.0.3.1 is the recommended method as it is simpler to configure, and can provide some additional benefits, such as being able to turn on and off the JVC with the Envy, if desired. However, if you do not have a way to connect the JVC to your local network, Approach 2 will also enable the JVC to automatically switch to the correct Picture Mode for both SDR and HDR content.

Step 1: SDR Picture Mode Setup

Follow the steps outlined in Section 2.0.2., to define the settings for SDR content.

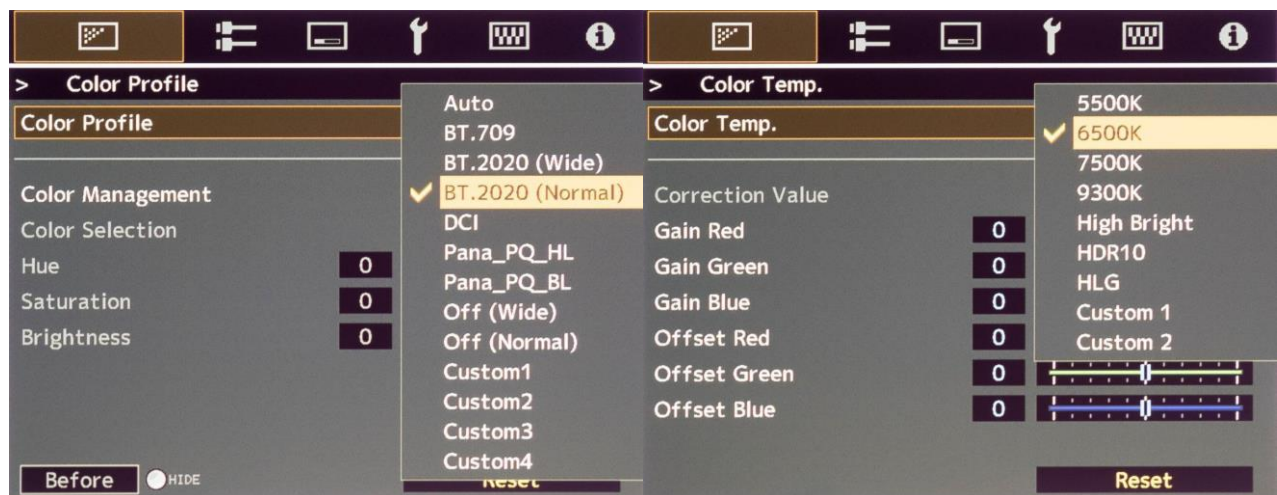
Next, use the “Auto Pic.Mode Select” menu available within the JVC Input Signal Menu (second menu option from the Left). Select SDR(2D) and then select “Natural” (or whichever Picture Mode you set up in Section 2.0.2 for SDR).



Step 2: HDR Picture Mode Setup

In this step, we set up the Picture Mode to be used for HDR content. Set Content Type to **HDR10** and Picture Mode to User 4.

For JVC projectors without a color file, the Color Profile should be **BT.2020**. For JVC projectors with a color filter, use either **BT.2020 (Normal)**, which uses no Cinema Filter, or **BT.2020 (Wide)**, which uses the Cinema Filter, depending on your preference. Since the Wide mode reduces brightness by 25-30%, many users choose **BT.2020 (Normal)** because they prefer a brighter image and the difference in gamut coverage can be indiscernible in most scenes. The Color Temp. should be set to **6500K**.

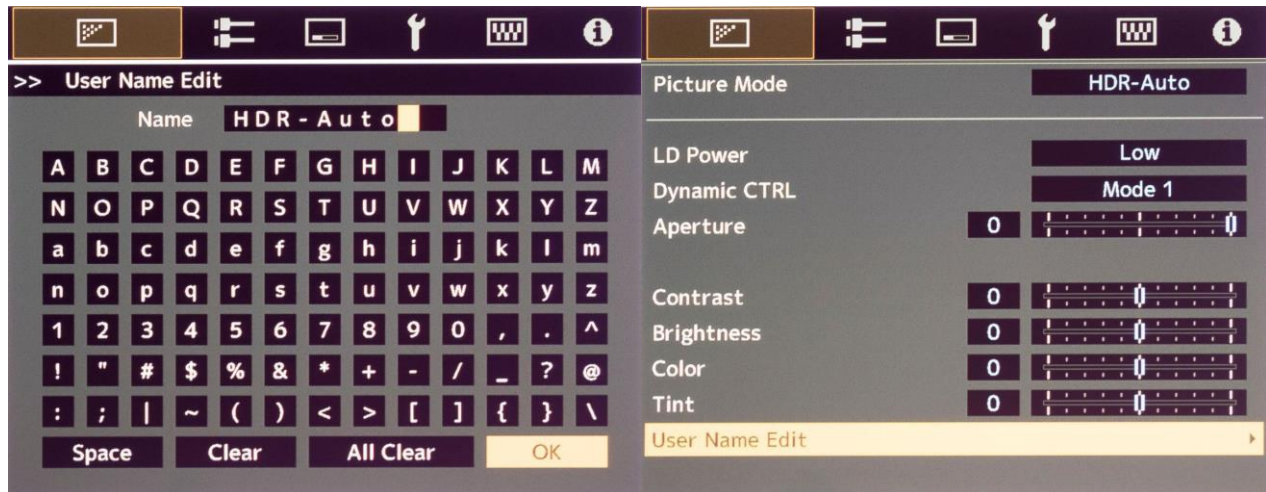


Next, select the Tone Mapping menu line in the **User 4** Picture Mode. This brings up a sub-menu with several options. Select **Custom 1**. Then go to the Correction Value menu line, and in the sub-menu, select **Import**.

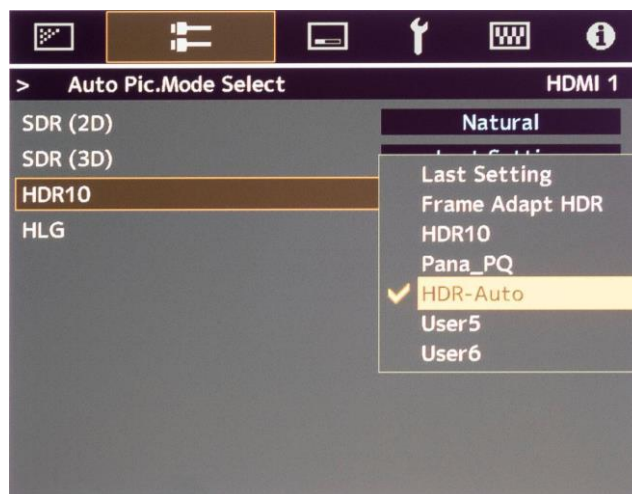


The default Gamma value when selecting “Import” is 2.2. You therefore need to select 2.2 in the Envy’s Transfer Function settings. We cover this in section 4.0.1.2.

To avoid confusion later about the purpose of this Picture Mode, we recommend assigning a custom name, such as “HDR-Auto”.

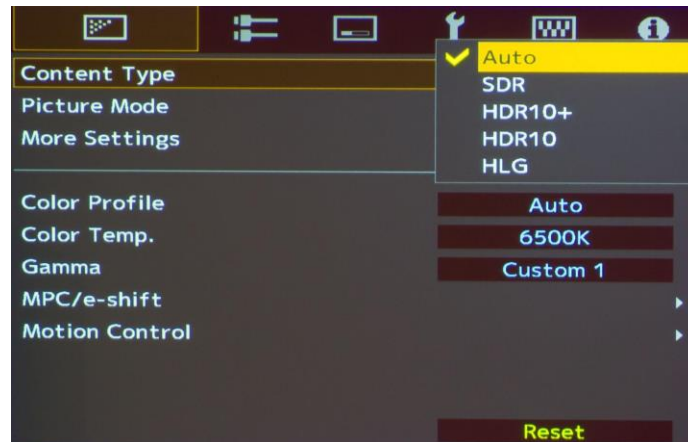


So that this picture mode is automatically selected for HDR content, select the “Auto Pic.Mode Select” option from the **Input Signal Menu**, as pictured below. Under **HDR10**, select **User 4** (or “HDR-Auto”, or whatever you named it above). The JVC will then automatically select this Picture Mode whenever it receives an incoming HDR signal.



Step 3: Set up JVC’s Auto-switching.

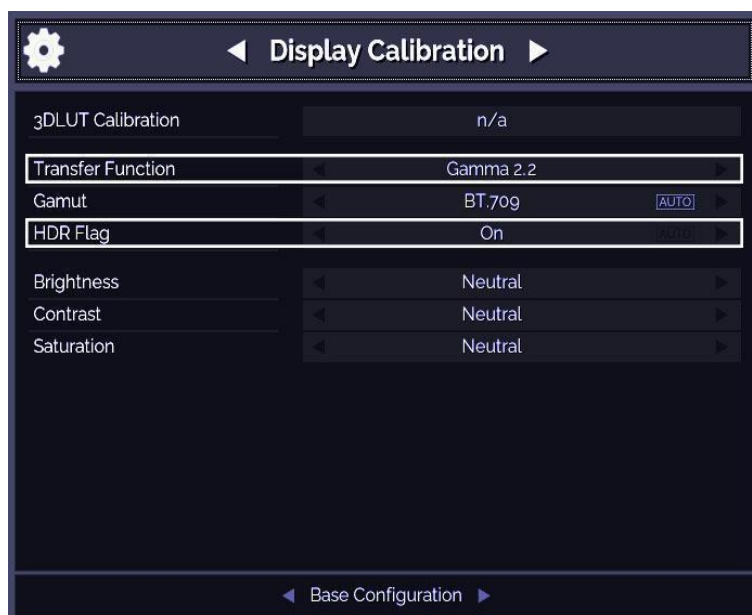
Go to the Content Type Line, and select Auto, as shown below. With this setting in place, the JVC will then automatically switch to the Picture Modes you selected in the AutoPic.ModeSelect Menu for both SDR and HDR content.



Step 4: Force the Envy to set the HDR Flag to On.

When using Approach 2 to automatically select a different Picture Mode in the JVC for SDR vs HDR content, you must set the HDR Flag to On. Please never do this unless you are using Approach 2, or it will lead to double tone mapping which looks quite poor.

- A. From the Envy Display Calibration menu, set the HDR Flag to On.
- B. From this same menu, you must also set the Transfer Function to Gamma 2.2. Do not worry – this does not mean the Envy will use a 2.2 gamma, but rather this is required so that the Envy and the JVC are “on the same page” and so the dynamic HDR tone mapping will be correct and irrespective of the set gamma value.



3.0 Other Projector Settings

There are a few other settings that need to be made in the Projector, in addition to the settings covered in section 2.0. For these settings, go to the Installation Menu (third option from the Left).

3.0.1 Anamorphic Mode

Always set the Anamorphic option to Off. If you have an anamorphic lens, this option should still be set to Off. Instead, set the Anamorphic lens option in the Envoy Screen Configuration menu so it uses its AI-based anamorphic stretch instead of the JVC anamorphic stretch.

3.0.2 Aspect

At the bottom of the Installation Menu, set Aspect to “Auto”. The output from the Envoy will be set in its Display Configuration Menu (see below), and the Auto setting will allow the Projector to use the correct resolution automatically.



4.0 Envoy Settings

This section covers important settings within the Envoy menus.

Important: After changing the settings as outlined below, be sure to press the Green button on the Envoy Remote on any setting marked as TEMP in the menu to permanently save your changes.

4.0.1 Envy Display Calibration Menu

4.0.1.1 Transfer Function

If you are not using a 3D LUT, you must set the Transfer Function in this Envy menu to match the Gamma value you set in the JVC.

- If you used the same Picture Mode selection for SDR and HDR, per section 2.0.2, or Approach 1 for using different SDR and HDR Picture modes, per section 2.0.3.1 – you must set the Transfer Function to the same Gamma value you selected in your SDR Picture Mode settings in the JVC (2.4 generally recommended).
- If you used Approach 2 for using different SDR and HDR picture modes, per section 2.0.3.2, you must set the Envy Transfer Function to 2.2. Refer to Step 2 in section 2.0.3.2.

4.0.2 Envy Display Configuration Menu

4.0.2.1 Levels

Just as we set the Input Level in the Projector to Limited (16-235), we need to set the Envy to do the same, as shown on the next page. Set this in the Envy menu to “Limited Range (TV).”

4.0.2.2 Peak Luminance

Peak Luminance is a measure (in “nits” or foot lamberts) 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, Laser Level, calibration settings, throw distance, and your screen size and gain.

The Envy uses the peak luminance measure to render all scenes according to director's intent, including very bright and very dark scenes. Therefore, it is important to specify an accurate Peak Luminance setting.

The best way to determine your peak luminance is to display a 100% IRE White pattern manually and then put the JVC into the Picture Mode used for HDR. Then measure it using third-party calibration software or a handheld LUX meter. The Envy has this pattern built-in, and it can be displayed using the Envy menu system.

If measuring with calibration software, enter the “cd/m2” measurement. If using a LUX meter, convert the LUX reading to nits by multiplying it by the Screen Gain and then dividing by Pi (3.14).

After measuring your peak luminance, enter it in the Envy Display Configuration menu, like shown in the image below.



Display Configuration

Resolution	3840x2160	AUTO BASE
Preferred Bit Depth	10 (in 12)	AUTO BASE
Color Space	RGB	AUTO BASE
Levels	Limited Range (TV)	BASE
Black Level	Neutral	BASE
White Level	Neutral	BASE
Measured Peak Luminance	120 nt (35.0 fL)	BASE
Desired SDR Luminance	120 nt (35.0 fL)	AUTO BASE
3D Luminance Boost	up to 4x	BASE

Active Configuration

5.0 Quick Sanity Check

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

- 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) and make sure that the “Framerate” shows 23.976. If instead it shows 59.94 then your source device(s) are not set up for proper playback – check our source setup guides on madvrenvy.com for more information. In general, make sure the source device outputs in a “native” or “direct” mode.
- While playing any 4K HDR movie, check the Envy **Incoming** Signal Information to make sure the “Transfer Function” shows “HDR”. If not, the Envy is not receiving HDR from the source player. This could be caused by a “rogue” device in the HDMI chain such as an HDMI switch, 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.
- While on the Envy **Incoming** Signal menu, press the right arrow once to access the **Outgoing** Signal Information. If you are not using the Envy Extreme’s MotionAI feature, make sure that the “Framerate” shown here matches the “Framerate” from the Incoming Signal Information menu (in this example, both should show 23.976Hz). If you are using MotionAI, then it is normal for the **Outgoing** Signal Framerate to be 48Hz, 60Hz, or 120Hz depending on your MotionAI settings, even for a 23.976Hz incoming signal.
- When playing HDR content, make sure the **Transfer Function** in the **Outgoing** Signal Information shows **SDR**, even though the content is HDR, if using the same Picture Mode for SDR and HDR per section 2.0.2, or if using Approach 1 to using different Picture Modes for SDR and HDR per section 2.0.3.1. However, if using Approach 2 to use different Pictures Modes for SDR and HDR option per section 2.0.3.2, the Transfer Function in the Outgoing Signal Information *must* show **HDR(PQ)**. If it does not, make sure the HDR Flag is set to On, and refer to section 2.0.3.2. Note that when playing SDR content, the Transfer Function in the Outgoing Signal Information should always show SDR, regardless.
- If the colors look undersaturated or oversaturated, check the Envy Outgoing Signal Information and verify that the Outgoing “Colorimetry” matches the color space you expect for the current content being played (e.g., “BT.2020” or “BT.709”), and check the JVC Picture Mode menu to confirm the projector is using the corresponding correct color space (revisit steps 2 and 3 in the Projector Settings section).