



madVR Envy

# JVC Laser Projector Setup Guide

NZ7/NZ8/NZ9

RS2100/RS3100/RS4100

[www.madvrenvy.com](http://www.madvrenvy.com)

Rev. 1.07

# 1.0 Introduction

Welcome to the madVR Envy Setup Guide for the JVC NZ7, NZ8, and NZ9 (RS2100, RS3100, and RS4100) series of 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

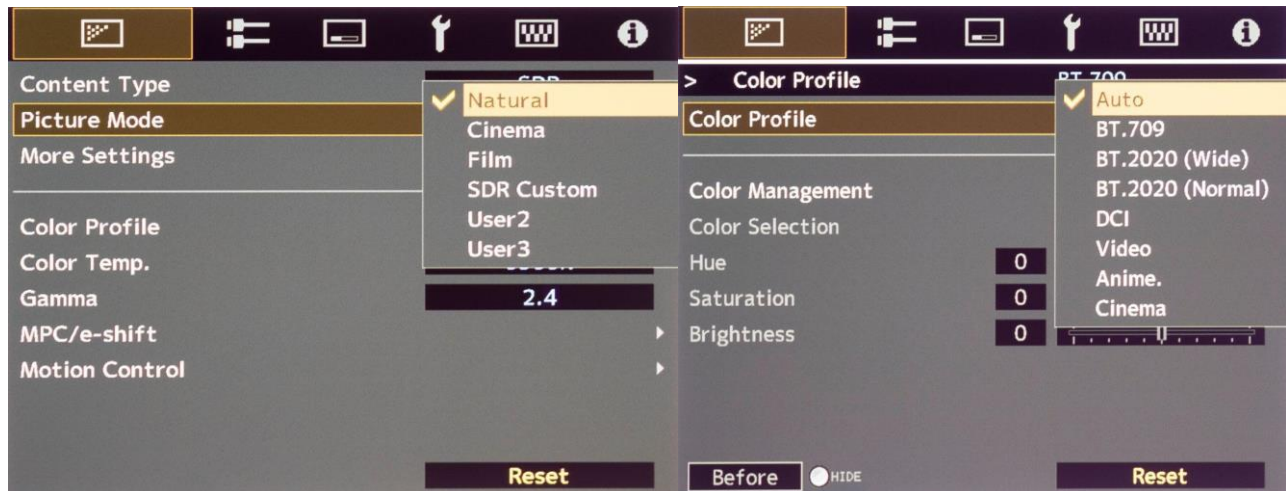
First, we want to set the Input Level and Color Space for the projector. Having a defined setting most of the time is desirable, as there are cases when the projector will use an incorrect setting if on “auto”, resulting in an inaccurate image. Set the Input level to “16-235 (Video)” and then set Color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



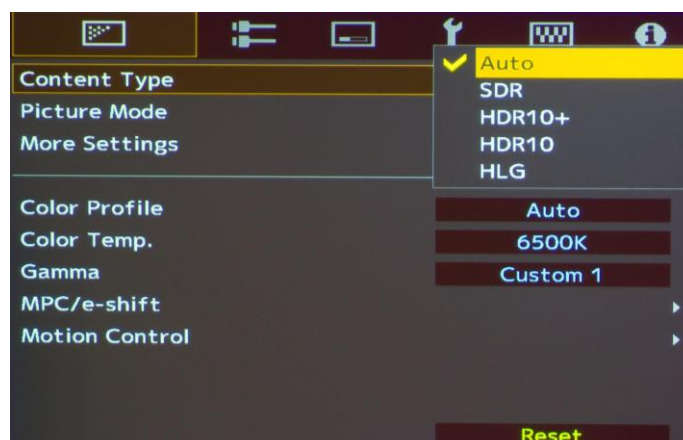
**Note:** Most video sources use 16-235, and 0-255 is mainly used with output from a computer. It is important to avoid a mismatch between the Source and the Display, so that black and white levels are correct.

### 2.0.2 SDR Picture Mode Configuration

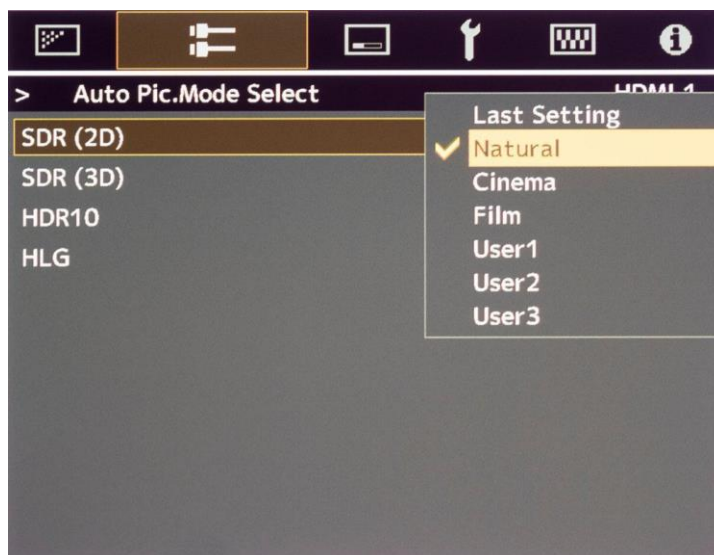
The Envy does not require any special JVC settings to display SDR content, so you can use whatever you prefer. One easy way to set up the JVC for displaying SDR content is to use the “Natural” Picture Mode, with Color Profile on Auto, Color Temperature at 6500K, and a Gamma of 2.4. Other settings in this Picture Mode can be set to your preference (Laser Level, Dynamic Control, etc.).



To have this Picture Mode automatically selected when receiving an SDR signal, there are two required settings in the JVC. For the first setting, select the main menu button on the JVC remote, and change the “Content Type” to “Auto”, as shown below.



For the second setting, use the “Auto Pic.Mode Select” menu available within the JVC Input Signal Menu (second menu option from the Left). Go to “SDR(2D)”, press Enter, and then select “Natural” (or whichever Picture Mode you set up from earlier in this section).



## 2.0.3 HDR Picture Mode Configuration

There are two approaches to setting up the JVC for playback of HDR content with the Envy. The first allows the JVC to automatically select the correct Picture Mode whenever it receives an HDR signal. The second approach requires the user to manually select the right Picture Mode, or to use a control system (e.g., Control4, Savant, Crestron, RTI) to select the correct Picture Mode.

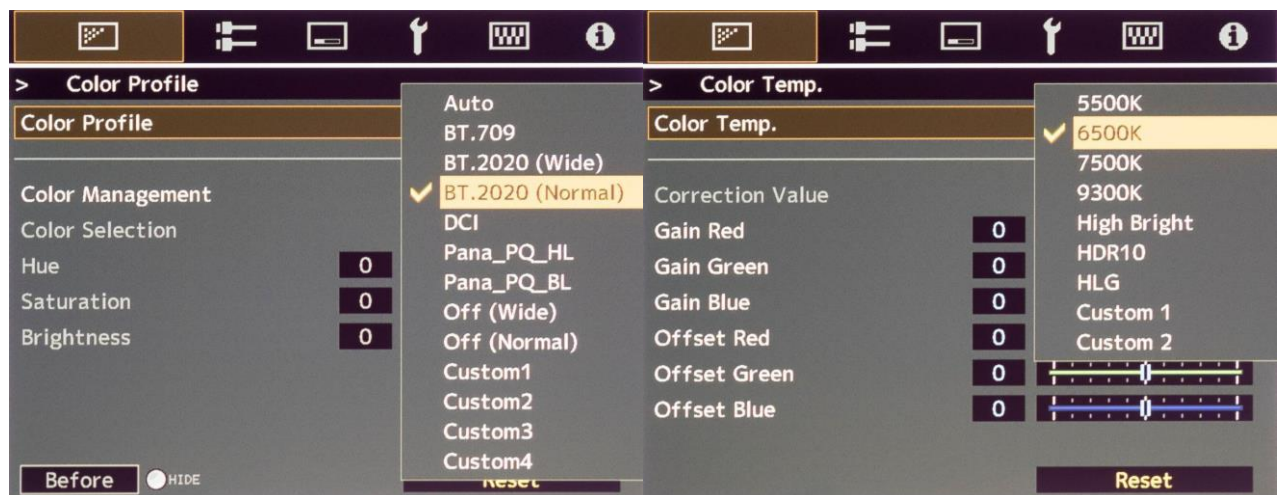
### 2.0.3.1 Automatic Picture Mode Selection

With Automatic Picture Mode Selection, the JVC automatically uses the settings configured for HDR content when the Envy sends HDR. Therefore, we need to configure a Picture Mode with HDR10 as the “Content Type”. In this example, we use the “User 4” Picture Mode.

For the NZ7/RS2100, the Color Profile should be BT2020. For the NZ8/NZ9/RS3100/RS4100, use either BT2020-Normal (no Cinema Filter) or BT2020-Wide (engaging the Cinema Filter), depending on your preference. Color temperature should be set to 6500K.

**Note:** Using the Cinema Filter provides the widest possible Color Gamut and is therefore our general recommendation, but this also reduces the brightness by around 25-30%.





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.”

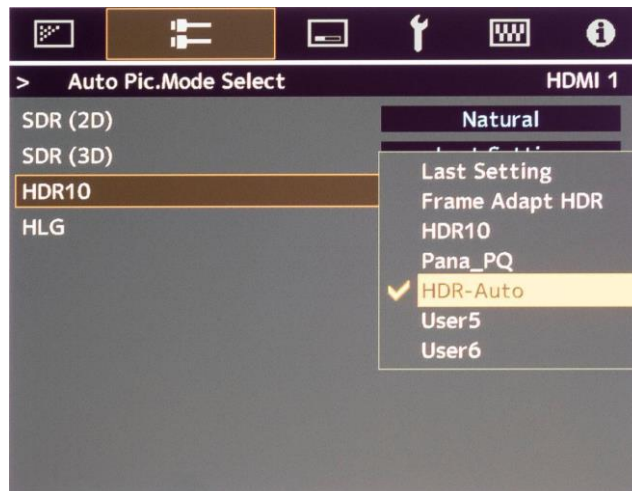


The default Gamma value when selecting “Import” is 2.2. You therefore need to select 2.2 in the Envy’s Transfer Function settings. We cover this in section 4.0.1.2.

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



In the SDR section above, “Auto” was already selected for SDR content. Now the option for HDR content needs to be set, also using the “Auto Pic.Mode Select” screen. For “HDR10”, select “User 4” (or “HDR-Auto”, or whatever you named it). The JVC will then automatically select this Picture Mode whenever it receives an incoming HDR signal, which requires a special setting in the Envy, as covered in section 4.0.1.2.



## 2.0.3.2 Manual Picture Mode Selection

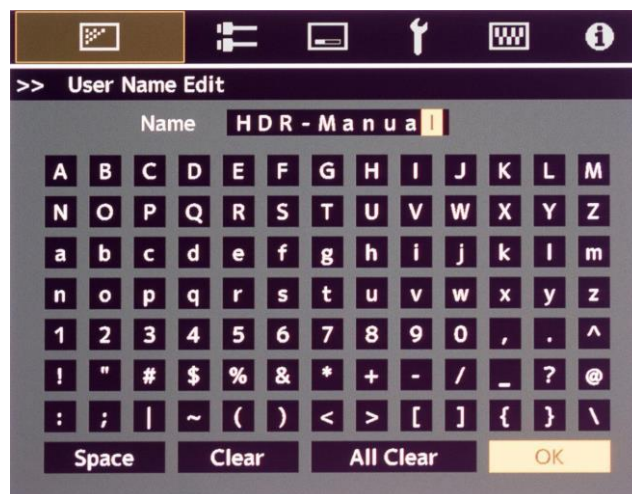
By default, the Envy intentionally sends HDR content inside an SDR container. This is because the content is already tone mapped, and the content should not be tone mapped again by the JVC. Therefore, we need to configure a Picture Mode to display this signal with the JVC settings we want used for HDR playback. For example, we may wish to use a higher laser output mode for HDR content. To set the Manual Picture Mode

we wish to use, select “User 1”, with the Content Type of “SDR”, and a Gamma of 2.4 (or whichever Gamma is chosen in the Envy’s Transfer Function, addressed in section 4.0.1.2).

The Color Profile choice here is the same as with the Automatic method in section 3.1. For the NZ7/RS2100, the Color Profile would be BT2020. For the NZ8/NZ9/RS3100/RS4100, use either BT2020-Normal (no Cinema Filter) or BT2020-Wide (engaging the Cinema Filter), depending on your preference. Color Temp should be set to 6500K.



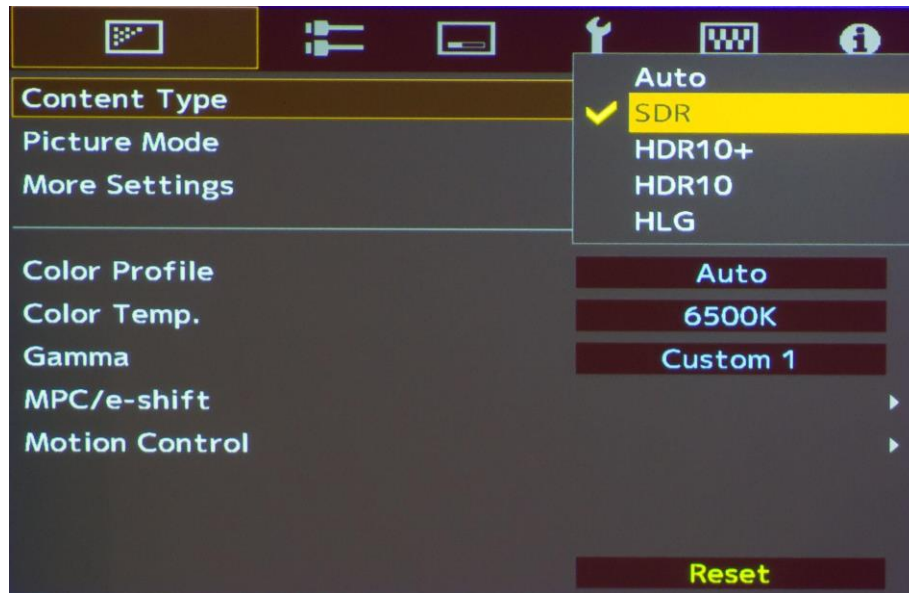
As discussed before, you can use the JVC’s ability to rename Picture Modes to make its purpose clear. Here you could use “HDR-Manual”, for example.



This Picture Mode uses the same SDR “Content Type” that is used for regular SDR content in section 2.0.3.1 above. This is the reason it must be chosen manually, or by using a control system, to properly view HDR content from the Envy.



Lastly, we need to make sure the Projector doesn't automatically change Picture Modes. For this, select the main menu button on the JVC remote, and review the "Content Type" field. The selection there should be "SDR" and not "Auto" as was used for automatic operation, as shown below:



**Important:** When using this option, you must set the HDR Flag menu option in the Envy to Off (see section 4.0.1.2).

## 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 Envy 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 Envy 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 Envy Settings

This section covers important settings within the Envy menus.

**Important:** Before making these changes, you must select "Base Configuration" instead of "Active Configuration" from the bottom of the Envy menu, as can be seen in the screenshot below. This will make these settings the new defaults (otherwise your changes will only be temporary).

### 4.0.1 Envy Display Calibration Menu

#### 4.0.1.1 Transfer Function

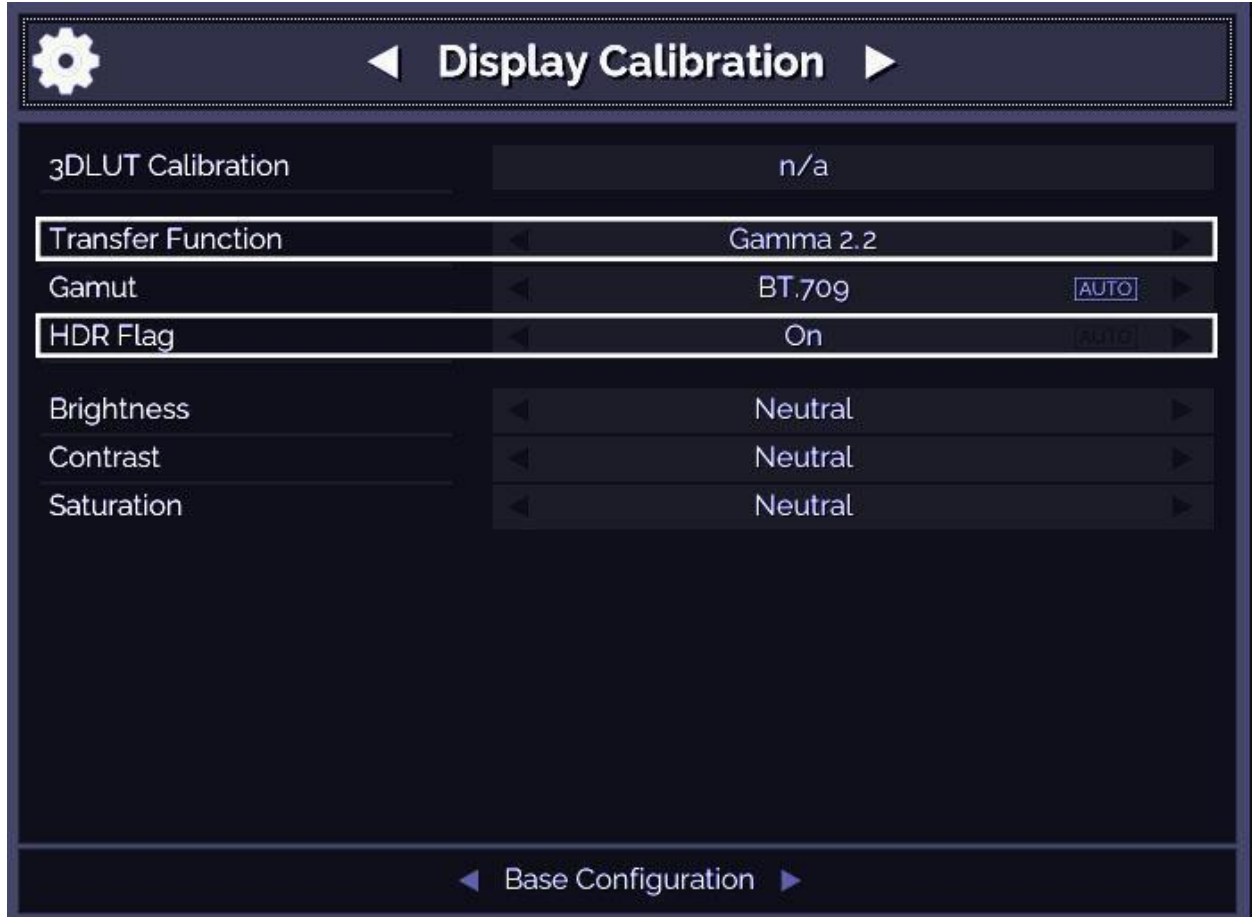
If you are not using a 3D LUT, you must set the Transfer Function in this Envy menu to match the Gamma value you set in the JVC.

- If you used the Automatic Picture Mode Selection discussed in section 2.0.3.1, you must use a Gamma of 2.2. This is shown in the Graphic below.
- If you used the Manual Picture Mode Selection covered in section 2.0.3.2, you must use a Gamma of 2.4, or whatever Gamma is selected in that Picture Mode, as in the example shown in section 2.0.3.2.

#### 4.0.1.2 HDR Flag

- If you used the Automatic Picture Mode Selection discussed in section 2.0.3.1, you must set this flag to On. The Projector will then receive this Flag when HDR content is being played, and automatically switch to the correct Picture Mode (User 4 or "HDR-Auto" as explained above).

- If you used the Manual Picture Mode Selection covered in section 2.0.3.2, you must set this to Off. As explained in that section, you will then have to manually change to the Picture Mode you created for HDR Content (in our example above, User 1, or “HDR-Manual”), or have your control system programmed to select this automatically.



## 4.0.2 Envoy 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 Envoy to do the same, as shown below. In the Envoy, this is called “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 manually put the JVC into the Picture Mode used for HDR and then display a 100% IRE White pattern. 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 determining your peak luminance, enter it in the area shown below.



## 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, and you are using an Apple TV or Kaleidescape, then your source device(s) are not set up for proper playback – check the Envy Apple TV and Kaleidescape Setup Guides on the madVR Envy website for more information. Or if you are using a different source device, check its settings and make sure the source device outputs in a “native” or “direct” mode.
- While playing the 4K HDR movie, check the Envy Incoming Signal Information to make sure the “Transfer Function” 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.
- While on the Envy Incoming Signal menu, press the right arrow once to access the Outgoing Signal Information. Make sure that the “Framerate” shown here matches the “Framerate” from the Incoming Signal Information menu (in this example, both should show 23.976). The Transfer Function should be HDR(PQ) if using the Automatic Picture Mode Selection, and SDR if using the Manual Picture Mode section. These modes are discussed in section 2.0.3.
- 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).