Layers

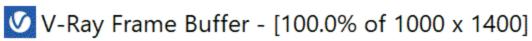
This page contains information on the Layers panel in the new V-Ray Frame Buffer.

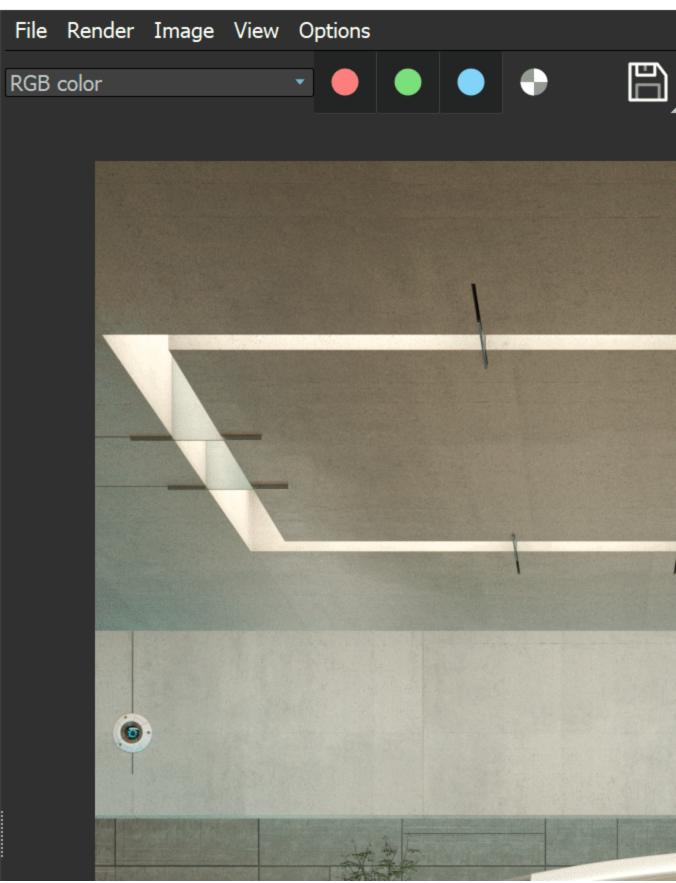
Overview

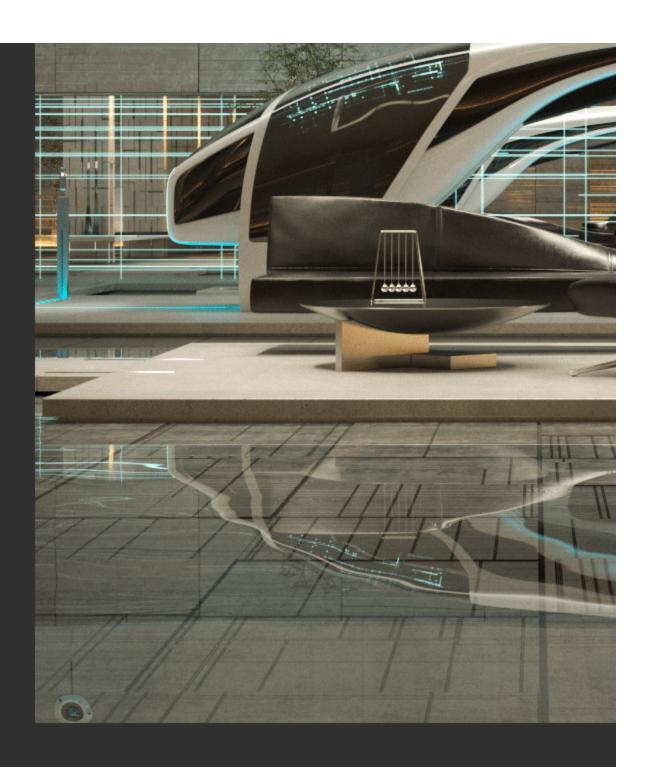
The Layers panel in New V-Ray Frame Buffer provides a new powerful workflow for making adjustments to your rendered image. You can bring out render elements and compose them together with individual color corrections in the panel's Composite mode. You can also color correct the final render just like you were able to do in the previous version of VFB.

New VFB is available in V-Ray 5 for Unreal or later. V-Ray Next for Unreal versions only support the previous V-Ray VFB.

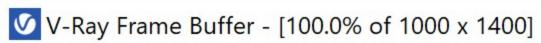
UI Path: ||V-Ray Frame Buffer|| > Layers

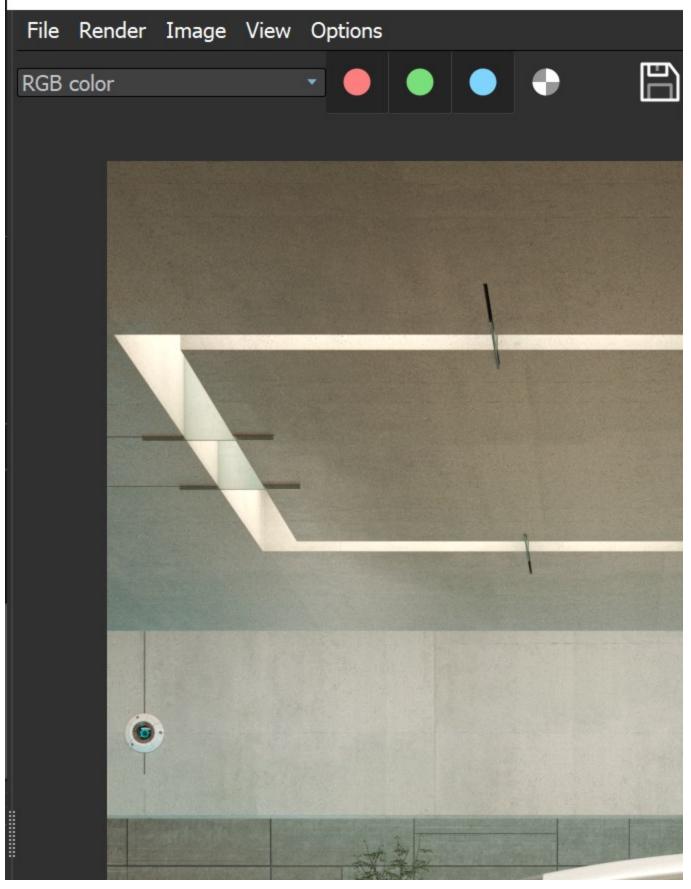


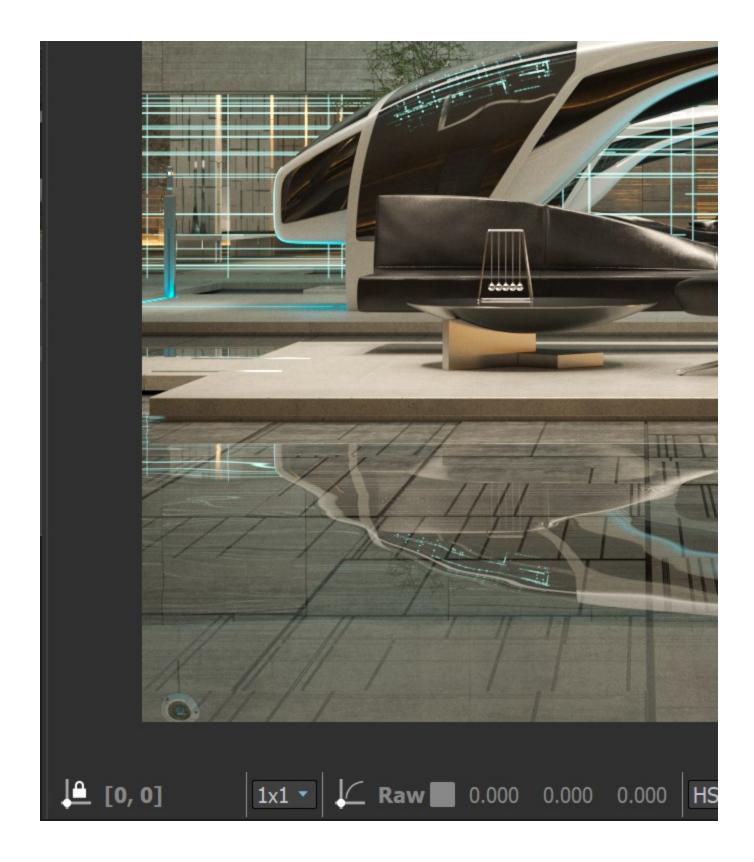






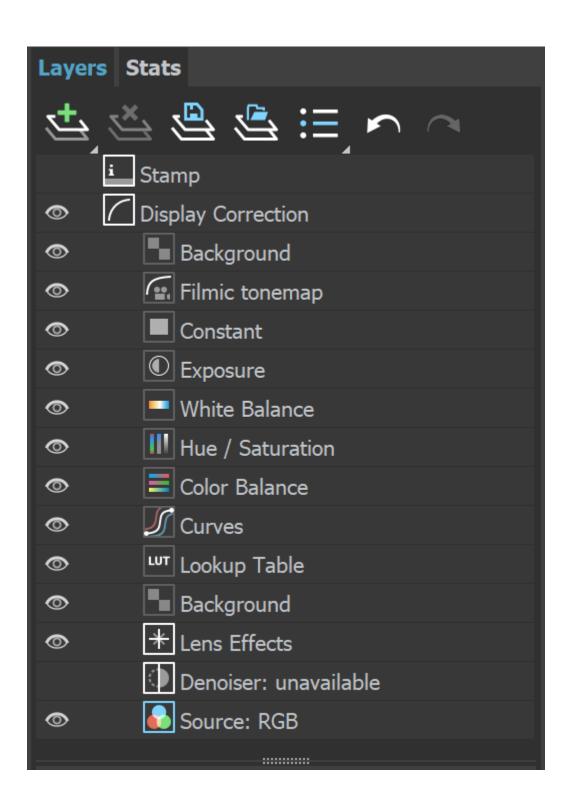


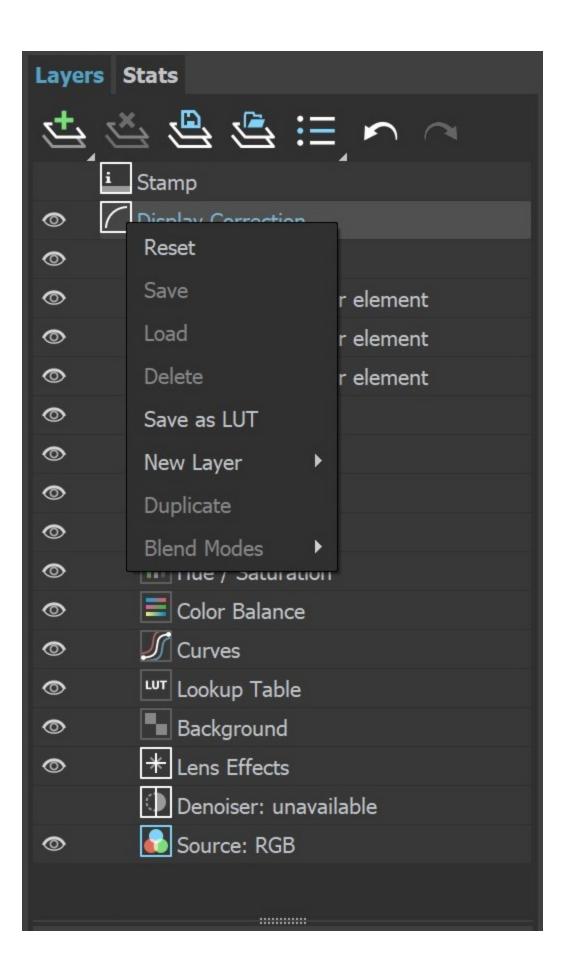




Layers Menu

Commands available for the Layers panel are located at the top of the panel. Press on the icons to see the expanded list of commands for the stacked buttons.







Creates a layer. Multiple layers of the same type can be added.

Folder - Allows grouping multiple layers in folders. This is only available when the Source layer is set to Composite;

Background – Adds a background color correction layer;

Render element - Selects a render element from your image that you can use in compositing. This is only available when the S ource layer is set to Composite;

Constant - Adds a solid color that can be used to achieve an effect on another layer (for example to multiply by the constant);

Exposure - Adds an Exposure color correction layer;

White Balance - Adds a White Balance color correction layer;

Hue/Saturation - Adds a Hue/Saturation color correction layer;

Color Balance - Adds a Color Balance color correction layer:

Curves - Adds a Curves color correction layer;

Lookup Table - Allows loading a LUT file for color transformations;

Filmic Tonemap - Contains different types of mapping curves and gamma corrections. Also allows selection of a color space.

Integer mask element - Mask is used with integer render elements like VRayRenderID, VRayObjectID, and VRayMtIID Render Flements

MultiMatte mask element - Mask is based on the MultiMatte Render Element.

Cryptomatte mask element - Mask is based on the VRayCryptyomatte Render Element.



Deletes the selected layer(s).



Saves a layer tree preset.



Loads a layer tree preset.



Quick access to custom layer presets. You must set the path to it in the VFB Settings.



Undo various actions related to layers such as create, delete, reorder or modify a layer.



Redo various actions related to layers such as create, delete, reorder or modify a layer.

Command	Description	
Reset	Resets all changes done to the selected layer.	
Save	Saves the layer as a preset.	
Load	Loads a preset for the selected layer.	
Delete	Deletes the selected layer.	
Save as LUT	Bakes all the color corrections to a LUT file.	
New Layer	Creates a new layer.	
Duplicate	Duplicates the selected layer.	
Blend Modes	Specifies how the selected layer blends with the result from all layers below it.	

Color correction layers like Exposure and White Balance can be applied to a single layer instead of the entire composite.

You can do that by selecting a layer and then adding a new correction or by dragging the correction layer to another layer until an arrow icon appears.

The Stamp, Display Correction, Denoiser, Lens Effects and Source layers are listed in the Layers panel by default to any rendered image. Their order cannot be changed.

Layers can be disabled from the visibility icon (), reordered, nested, stacked in folders, etc.

Corrections are applied from the bottom to the top, except for nested layers, which are executed after their parent.

Color corrections and the denoiser channel are saved in the output image just like they are applied in the VFB.

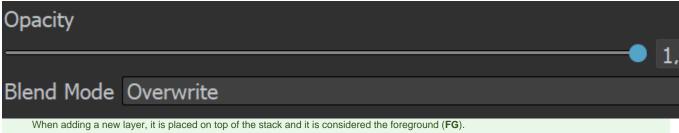
Adjustments made to the Display Correction layer are only applied for preview purposes in the VFB. Display corrections are usually saved for 8-bit image formats like JPEG and PNG and not to EXR files, which are expected to be linear.

Blend modes

Layers are applied from the bottom to the top, where the bottom is the background (BG) and the top is the foreground (FG) of the composite.

Opacity - Controls the weight of the layer. A value of 0 means no effect and a value of 1.0 means full effect.

Blend Mode - Specifies how the layer blends with the result from all layers below it:



The result of all layers below it is considered the background (BG). Layers are applied from the bottom to the top.

Where darker and lighter pixels are mentioned below, it is in relation to mid-grey.

Blend Mode*	Description
Overwrite	Displays the current layer (FG) on top of all layers (BG) without blending. This is the default.
Normal	Blends the alpha of the VRayMtlSelect render element's material and other layers. See Notes for more information.
Average	The average of the current layer (FG) and the result from the layers below it (BG).
Add	Adds the FG to the BG .
Subtract	Subtracts the FG from the BG .
Darken	Compares the FG to the BG and takes the darker pixel values of the two.
Multiply	Multiplies the FG by the BG.
Color Burn	The color of the FG is applied to darker pixels in the BG .
Linear Burn	Same as Color Burn but with less contrast.
Lighten	Compares the FG to the BG and takes the lighter of the two.
Screen	Makes both light and dark areas lighter.
Pin Light	Replaces the BG colors depending on the brightness of the FG color. If the FG color is lighter than mid-gray, BG colors darker than the FG color are replaced and vice versa.
Difference	Compares the pixels in the BG and FG and subtracts the darker pixels from the brighter ones.
Exclusion	Same as Difference but with less contrast.

Uses the hue from the FG , while the value and saturation are taken from the BG .	
Uses the saturation from the FG , while the value and hue are taken from the BG .	
Uses the hue and saturation from the FG , while the value is taken from the BG .	
Uses the value from the FG , while the hue and saturation are taken from the BG .	
Adds the FG to the BG and for each color component returns a value of 255 if the result is 255 or greater, or returns 0 if the result is less than 255.	
The color of the FG is applied to lighter pixels in the BG .	
Same as Color Dodge but with less contrast.	
Same as Multiply , but with twice the brightness.	
Same as Spotlight , but additionally brightens the BG .	
Darker pixels become darker where the BG is dark and brighter pixels become brighter where the BG is bright.	
Darker pixels become darker where the FG is dark and brighter pixels become brighter where the FG is bright.	
Spotlight is applied to pixels where the FG is dark and Screen is applied to pixels where the FG is bright.	

^{*} All 8-bit blend modes clamp colors to a maximum value of 1.0.

Stamp

The Stamp layer is always placed on top at the layers tree by design. When enabled, it contains info regarding V-Ray version, frame, number of primitives, as well as the time elapsed.

Alignment – Aligns stamp options. You can choose from *Left alignment*, *Right alignment* or *Cent er alignment*, as well as from *Bottom* and *Top*.

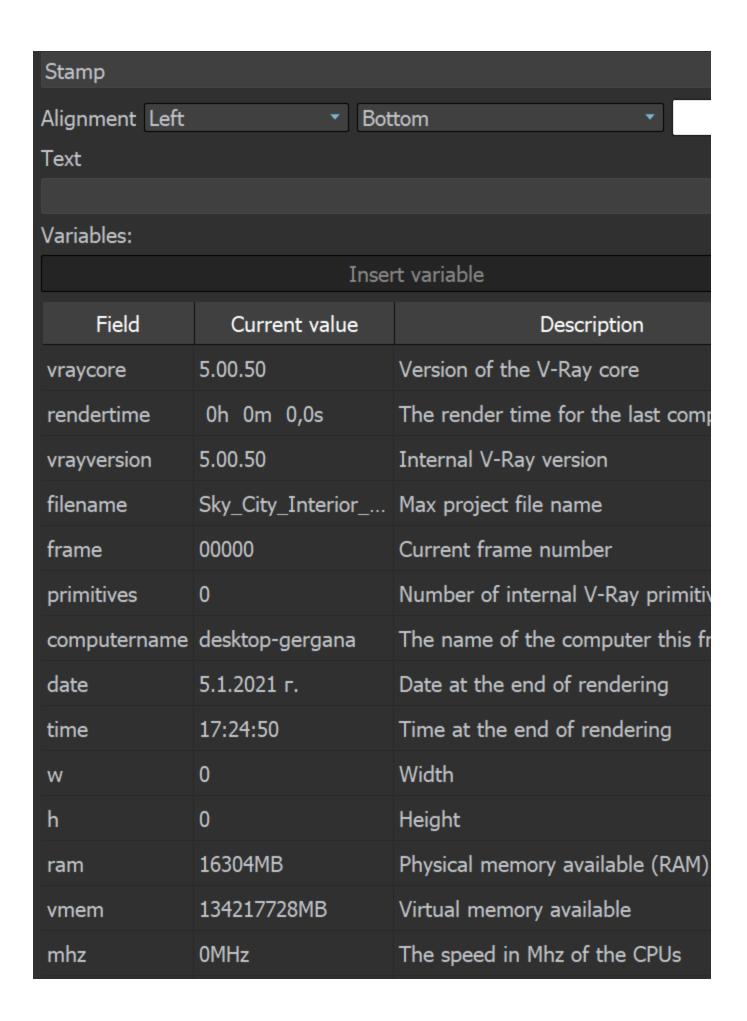
Color - Changes the stamp color.

Font – Opens the Select Font window to change font, its style and size.

 $\label{lem:variables} \textbf{Variables} - \textbf{Stamp variables can be typed directly into the stamp textbox with a \% symbol before and separated with a | symbol. Example: %rendertime | %frame | %camera$

Field	Description
vraycore	Version of the V-Ray core
rendertime	The render time for the last completed frame
vrayversion	Internal V-Ray version
filename	Max project file name
frame	Current frame number
primitives	Number of internal V-Ray primitives used in rendering
computername	The name of the computer this frame was rendered on
date	Date at the end of rendering
time	Time at the end of rendering
w	Width
h	Height
ram	Physical memory available (RAM)
vmem	Virtual memory available
mhz	The speed in Mhz of the CPUs

cpu	CPU type and number of CPUs available	
os	OS version	
camera	Camera name	
numPasses	Sampling level reached: number of passes	
numSubdivs	Sampling level reached: number of subdivs	
noiseThreshold	Noise threshold reached (progressive sampler only)	



cpu	INTEL/OctaModel:	CPU type and number of CPUs av
os	Win10	OS version
camera	<unknown></unknown>	Camera name (camera views only
numPasses	0	Sampling level reached: number
numSubdivs	0,00	Sampling level reached: number
noiseThreshold	0,000000	Noise threshold reached (progres

Masks

The V-Ray Masks are used to refine only selected parts of the rendered image in the New VFB. They can be applied to Color correction layers and also to Folders in the VFB layers tree.

When one or more masks are applied to a Folder or Color correction layer, a mask icon is placed in front of it in the layer tree to signify its presence. The parameters of each mask are available in their own separate tabs to the Properties of the masked layer or folder.

When a folder or a color correction layer has mask(s), the **Show masks' preview** option is available in the Parameters Tab of the respective folder/color correction layer. This option shows a preview of the masks elements when selected.

For more information on masks, see the Masks page.

Show masks' preview

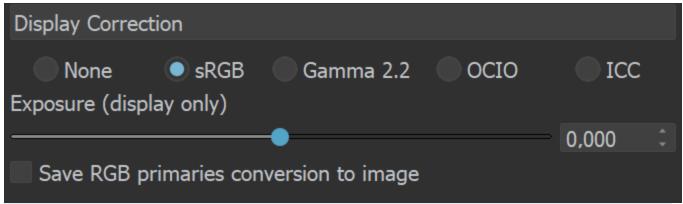
Display Correction

The Display Correction layer specifies the color space, in which the image is displayed. You can choose between sRGB, Gamma 2.2, OCIO and ICC or select None to return to a linear display.

The ICC correction allows you to apply an ICC profile to the image, so that (for example) it matches the appearance of the image in Adobe PhotoShop. This is a display correction that is only applied when the image is viewed in the frame buffer. It is not applied when the image is saved to a file.

The OCIO correction allows you to apply color corrections from an .ocio color profile to image colors. When this correction is enabled and no specific .ocio profile is specified, it attempts to read the **OCIO** environment variable and apply the profile specified in it.

Save RGB primaries conversion to image – When enabled, saves the RGB primaries conversion to image.



Normally you would specify the ICC file for your calibrated monitor here. Programs like PhotoShop display images using your (primary) monitor's ICC profile automatically. However (at least for the moment), 3ds Max is not a color-managed application and you must manually load the monitor ICC profile into the V-Ray frame buffer in order to match the appearance of your images in PhotoShop.

The Display Correction layer cannot be removed or reordered. It is always applied on top of all other layers, as it specifies the display color space of the resulting image or composite in the frame buffer.

The Exposure slider in the Display Correction layer is only for display purposes and is not saved when writing to files.

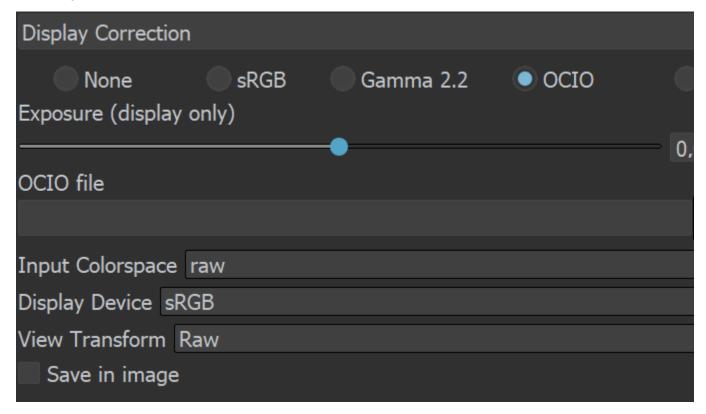
OpenColorIO (OCIO)

Input color space – Specifies the input color space for the image; normally this is a linear color space as V-Ray internally works in that space.

Display Device – Specifies the device on which the VFB with the image is displayed.

View Transform - Specifies the viewing transformation.

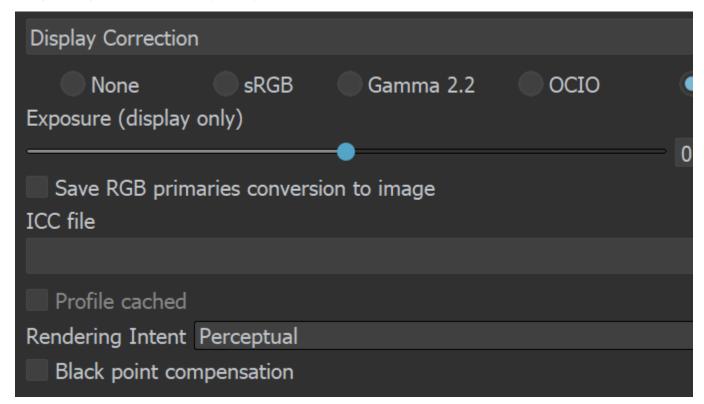
Save in image – Saves/bakes the OCIO effect along with the image. This does not affect multichannel images (such as multi-channel .exr).



Profile cached – When loading an ICC file, this checkbox indicates whether the file is smaller or bigger than a given threshold of 64k. If the file is smaller than 64k, the checkbox is ticked to indicate that the ICC file is directly embedded in the scene. If the loaded file is bigger than 64k, the checkbox is inactive which indicates that you must either put the ICC file in the Max project folder, or set the correct path to load it.

Rendering Intent – Specifies an ICC color replacement scheme. You can choose from *Perpetual*, *Relative colorimetric*, *Absolute colorimetric*, and *Saturation*.

Back point compensation - Enables back point compensation.



Source

The Source layer determines the input of the layers stack. It specifies if you work on your rendered image, composite or light mix.

RGB - The rendered image is the source.

LightMix - This mode allows you to adjust the intensity and color of your lights during and after the render. Changes can be transferred back to the lights in the scene.

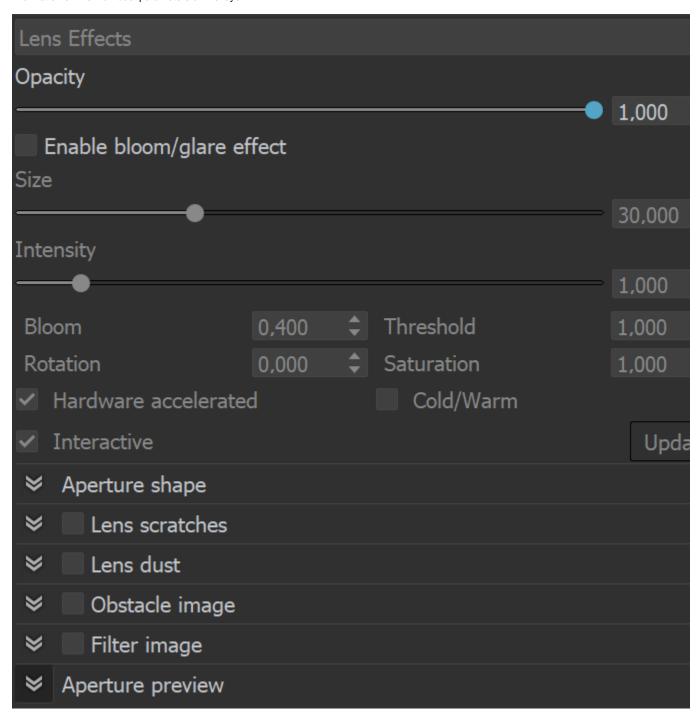
Composite - You can add Render element layers in this mode and start compositing your image from the render elements rendered with it. For example, you can do a simple Back to Beauty compositing of your image in this mode.

LightMix not currently available.



Lens Effects

The Lens Effects layer simulates real-world camera lens effects such as bloom and glare. The plug-in uses a fast multi-threaded technique to compute the result and provide immediate update in V-Ray VFB. V-Ray Lens Effects are applied in the effectsResult channel together with other post effects executed over the RGB rendered image. See the Lens Effects page for more information on the individual parameters of this layer.



Denoiser

Calculate denoiser – Enables/disables the denoiser calculation. This can be useful sometimes while adjusting your render. Disabling the denoiser layer visibility instead still calculates the denoiser in the background. *Read more about this working with the denoiser on the V-Ray Denoiser page*.

Update – Updates the Denoiser layer manually and also initiates a Lens Effects update.



Background

This section allows you to load an image and use it as a background for your rendering.

Load – Loads a file that is going to be used as a background. Image sequences can be loaded as well using the <frameNum> tag.

Stretch – Controls the aspect ratio of the image by stretching the image to fit the VFB.

Fit – Keeps the aspect ratio of the image. Enlarges or shrinks the VFB to fit the image.

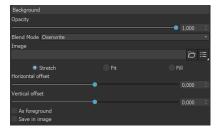
Fill – Keeps the aspect ratio of the image and cuts some parts of the picture to fill the VFB.

Horizontal offset – Controls the background image position by the X axis.

Vertical offset - Controls the background image position by the Y axis.

As foreground – When enabled, the image loaded in the field above is used as a foreground. This means that the image is on top of the rendering and you are able to see the rendering only if the image has an alpha channel.

Save in image – When enabled, saves the layer to the image.



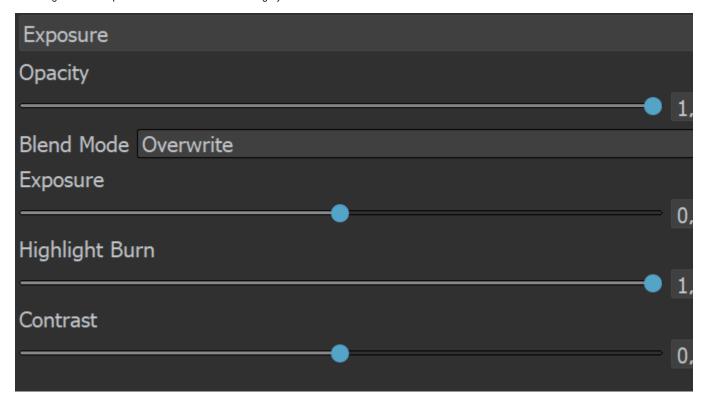
Constant

This color correction applies a solid color that can be used as a constant to achieve an effect on another layer. For example, it can be multiplied by another layer.



Exposure

This color correction applies exposure and contrast to the image. An **Exposure** value of 0.0 leaves the original image brightness, +1.0 makes it twice as bright, and -1.0 makes it twice as dark. **Highlight Burn** selectively applies exposure corrections to highlights in the image. Positive **Contrast** values push the colors away from the medium gray value to increase image contrast, while negative values push the colors closer to medium grey.



White Balance

The White Balance sliders correct the colors in the image so that objects that are white appear as pure white (and not tinted blue, yellow, red, etc.) in the final image.

Temperature - Adjusts the white balance of the image by specifying the color temperature in Kelvin. Lower values make the image bluer, higher ones make it more amber.

Magenta - Green tint – Adjusts the white balance of the image to make it greener (positive values) or more purple (negative values).

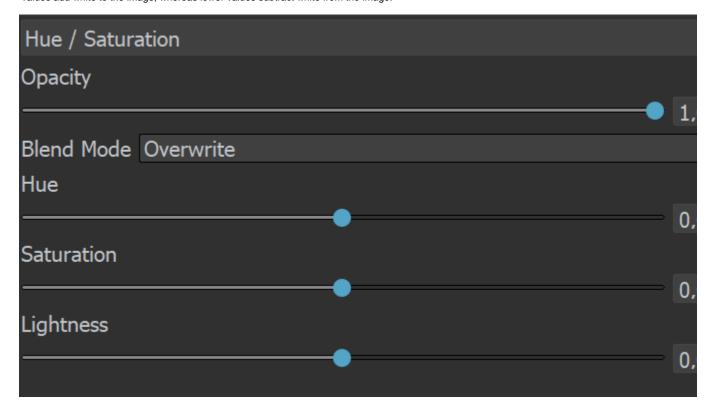
Color tint – Picks or chooses a color to be the new "white point" for the image, adjusting all colors. Use it to pick a neutral color from the image (e.g. one that should be white or gray).

Render view color picker – Picks a color from the render window. Left-click to choose a new "white point" or a tint to neutralize. Right-click to pick a tint to boost.



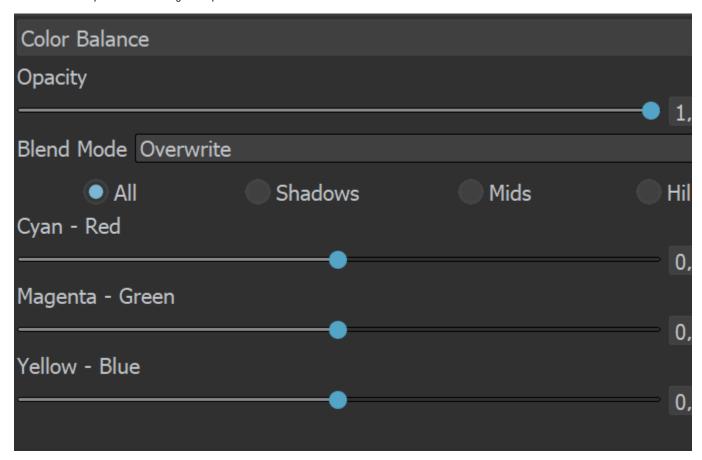
Hue/Saturation

This correction applies HSL transformation on the image colors. Moving the **Hue** slider changes the overall hue of the image colors (grey colors remain intact). Lower **Saturation** values move the image towards greyscale while higher values increase the colors' intensities. Higher **Lightness** values add white to the image, whereas lower values subtract white from the image.



Color Balance

This correction adjusts the overall color tone of the image, as well as the tone of the dark (shadow), medium, and bright (highlight) colors. The color corrections are additive in that the **All** correction affects all colors of the image, and the **Shadows/Midtones/Highlights** options adjust the individual components in the image on top of the **All** correction.



Curves

This correction allows you to remap the image colors with a Bezier curve. The control also allows you to save and load .acv curve files from Adobe PhotoShop.

Controlling the View

Use the mouse wheel to zoom in and out of the curve view by both axes. Alternatively, use Alt + Right-mouse button to zoom in/out by the axis in which the first mouse movement is detected. Moving right or left locks the vertical axis and allows zooming in/out only the horizontal axis. Moving up or down locks the horizontal axis and allows zooming in/out only the vertical axis.

Drag with the middle mouse button or Hold Shift + Mouse Left button + mouse move to pan.

Controlling the Bezier Points

Click on a point to select it. Draw a rectangle to select multiple points at once. Click and drag on a selected point or its tangents to move them. Alternately, select a point, then hold Alt while moving it. Moving right or left locks the vertical axis and allows moving only along the horizontal axis. Moving up or down locks the horizontal axis and allows moving only along the vertical axis. To add a new point, **double click** on the curve. To delete points, select them and press **Del**. Once a point is selected, you can also use the input coordinates field to modify its position. To display the input coordinates field either press **Enter** or right-click on the point and then select **Edit point**.

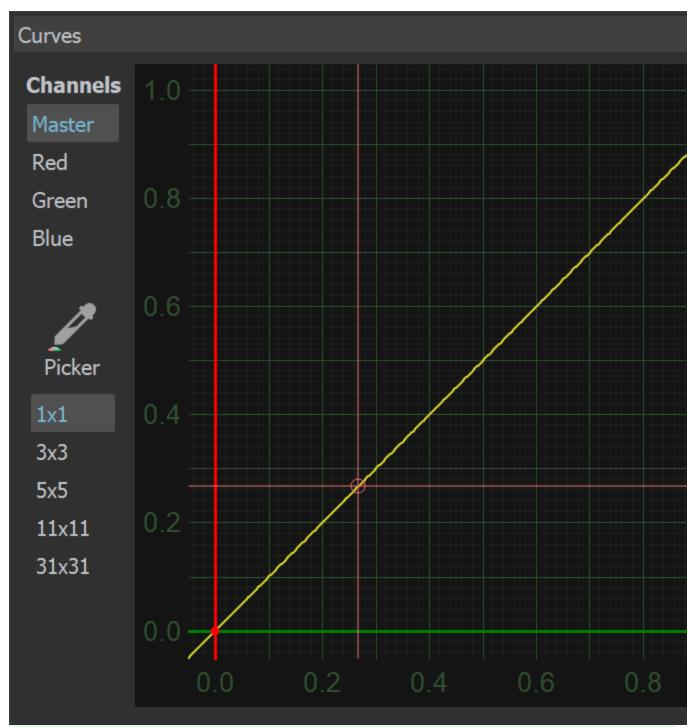
Right-click on a point to bring up a context menu with additional options for that point.



Context Menu

Right-clicking in the curve view brings up a context menu with additional options:

Menu Item	Description	
Themes	Specifies between a default theme or a color grading.	
Zoom all	Adjusts the curve view so that all points are visible.	
Undo/Redo	Undo and redo modifications to the curve.	
Load	Loads the curve control from a file. Two formats are available: native .bcurve and PhotoShop .acv.	
Save	Saves the curve control to a file. Two formats are available: native .bcurve and PhotoShop .acv.	
Reset Master	Resets the curve control to its default state.	
Select internal only	Selects only the points which are currently visible in the curve view.	
Select all	Selects all points.	
Snap to grid	Toggles snapping to the curve grid. When enabled, moving points snaps them to the grid nodes.	



To create a point, select the **Picker**, then go to **Render View** and click. Hold click + mouse move to create and move the point. When working with .acv files, some approximations are performed because the curves in the .acv files are described by a different mathematical formulas.

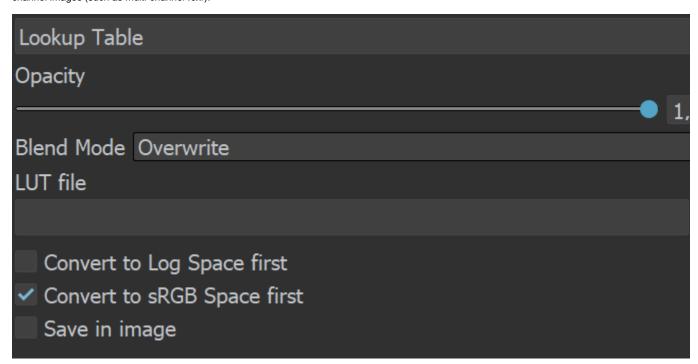
Lookup Table

This correction allows you to remap the image colors based on an IRIDAS .cube LUT (Look-Up Table) file.

Convert to Log Space first – Converts the Base map to a logarithmic color space before applying the look-up table.

Convert to sRGB Space first – Converts the Base map to a sRGB color space before applying the look-up table.

Save in Image – Saves/bakes the LUT effect along with the image. This does not affect multi-channel images (such as multi-channel .exr).



Filmic Tonemap

This correction allows you to control different types of mapping curves, make gamma correction and select a color space. Note that color values are mapped per channel.

Tone mapping space – Specifies the color space where the operator is applied. Converts the image to the selected space and back, if needed. You can choose between *Linear sRGB* and *AC ESca*.

Type – Specifies the type of curves used for the tone mapping. You can choose between *Linear*, *Hejl-Dawson*, *AMPAS* (ACEScg), Hable, and Power Curve.

Log space – Converts the image to log space before applying the tone mapping.

Gamma – Specifies the gamma correction. It is applied before the operator.

Use blue fix – Applies an additional transformation to ACEScg primitives that results in pure blues burning out through cyan instead of magenta. Available when Tone mapping space is set to *ACEScg*.

AMPAS (ACEScg)

AMPAS mode applies an approximate ACES standard curve.

Hejl-Dawson Type

Shadows – Shadow compression. Higher values darken the shadows, while also brightening the mid tones.

Highlights - Highlight compression. Higher values reduce burnout.

Hable Type

Shoulder strength – Determines how sharp the shoulder is. Higher values sharpen the shoulder, which results in an overall brighter image.

Linear strength - Determines the strength of the effect from changing Linear angle.

Linear angle – Determines the angle of the curve at the base. Higher values increase the angle.

Toe strength – Low to mid tone compression. Higher values darken the low and mid tones.

White point – The intensity, which gets mapped to 1. This parameter scales the whole curve evenly.

Power Curve Type

Toe length – Determines the range of low to mid tones that are compressed.

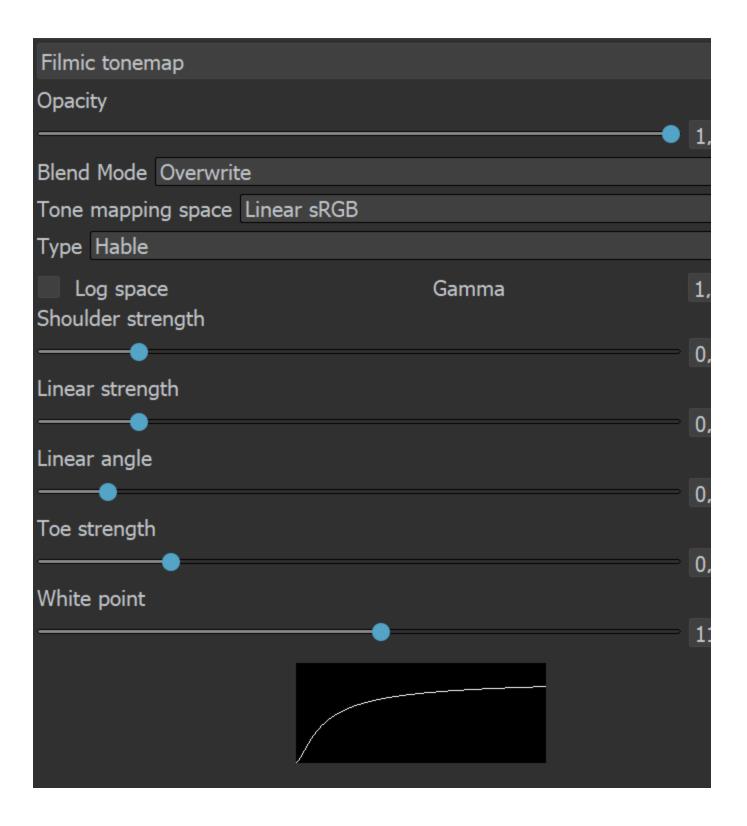
Toe strength – Low to mid tone compression. Higher values darken the low and mid tones.

Contrast – Higher values increase the contrast between low and high tones.

Shoulder length – Determines the range of mid to high tones that are compressed.

Shoulder strength – Mid to high tone compression. Higher values darken the mid and high tones.

White point – The intensity, which gets mapped to 1. This parameter scales the whole curve evenly.



Notes

Color corrections in RGB mode are applied to all Beauty render elements and some Utility render elements too. They are not applied to render elements that present masks or hold geometry or computational data for the rendered frame.

Alpha blending is possible by using the VRayMtlSelect render element. When blending between the VRayMtlSelect layer and other layers using the Composite source, set the Blending mode to Normal to take Alpha into consideration.