



Title: IMAGE PROCESSING WITH i-SPEED VIEWER
Date written: 08/22/2017
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Keywords: i-SPEED Viewer, Image Processing, Histogram

Overview

i-SPEED Viewer is iX Cameras' free playback software which allows you to quickly and easily play, alter and save your captured high-speed video, allowing you to share it worldwide. In addition to video playback and resaving options, i-SPEED Viewer can also apply advanced image processing to your clips, allowing you to adjust and resave the video for a variety of purposes.

Note: This guide aims to provide some understanding of the process behind video manipulation and provide simple help to adjusting your captured video. Since every video and every application is different, nothing is effective as experience and experimentation when it comes to video manipulation and image processing.

Load a Video

Load the video you wish to process by either searching for the clip in the **Browser** panel, or by clicking on the **Viewer** panel and dragging the clip or image into the workspace.



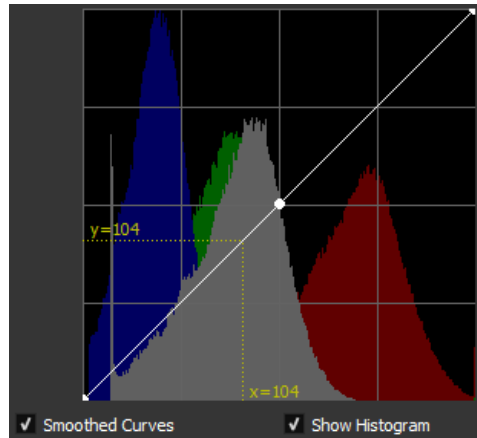
Opening Video Processing

To begin image processing, click on the **Image Processing** tab typically docked on the far right of the window, directly below the **Play Controls** tab. This opens the **Image Processing** Save / Load Controls, **Basic Controls** and the **Color Curves**.

Basic Controls (resets Curves)

The basic image processing controls present are **Brightness**, **Contrast**, **Gamma**, **Exponential** and **Invert**. Any of these controls can be enabled for all or one of the three available channels on a color video. Before adjusting any of the basic controls, it is often useful to turn on the histogram for the image by checking the **Show Histogram** box.

A histogram is a visual representation of the colors and intensities shown on the screen at any given time, with values to the left of the graph indicating darker pixels and values to the right indicating lighter pixels. The height of each grouping indicates the prevalence of that color's intensity. If the histogram is stacked further to the right, your video will be brighter, if the histogram is stacked closer to the left, your video will be darker.



Channel

By default, the Channel selection is set to Intensity, which represents all of the color channels together. Alternately you can adjust the red, green or blue color channels, isolating and boosting specific color ranges, or dampening and removing color channels.

Brightness

The brightness slider adjusts the intensity of the channel selected in direct relation to the value added. By default the brightness is set to 0. Increasing the brightness value will increase the prevalence of whatever **Channel** you have selected. Adjusting the brightness on all channels (Intensity) changes all black values into grey values as it simply moves all of the values up towards pure white.

Contrast

The contrast on an image spreads out and increases the differences between pixels. If you increase the contrast, you begin to spread out the histogram, and put empty spaces between pixel intensities. Adjusting the contrast makes lighter colors get grouped together with other lighter colors, defining hard lines and gradients between intensities and colors. When increasing the brightness on a video it is typically a good idea to also increase the contrast of the video to preserve some of the darker colors and to prevent the final product from looking washed out.

Gamma

Gamma is a form of non-linear brightness intensity adjustment which boosts the mid range of the selected channel, keeping absolute black and absolute white while still boosting intensity and increasing contrast. Using gamma is a great way to brighten the video without having it look washed out.

Exponential

Exponential is another form of non-linear intensity adjustment which boosts the overall intensity of the channel, but does not keep absolute black and absolute white during the process. Unlike Gamma, the exponential controls can be used to darken an overly bright scene.

Note: Always perform Basic Controls first when performing image processing as it alters the curve and histogram lines. Changing the basic controls will result in losing any curve adjustments that you have made.

Color Curves

The Color Curves region allows you to isolate individual color regions by selecting individual points and increase their intensities in a smooth or isolated manner, depending upon neighboring points.

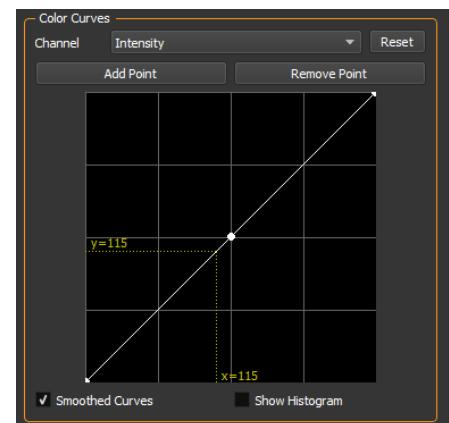
Channel

By default, the Channel selection is set to Intensity, which represents all of the color channels together. Alternately you can adjust the red, green or blue color channels, isolating and boosting the intensity of specific color ranges, or dampening and removing color channels.

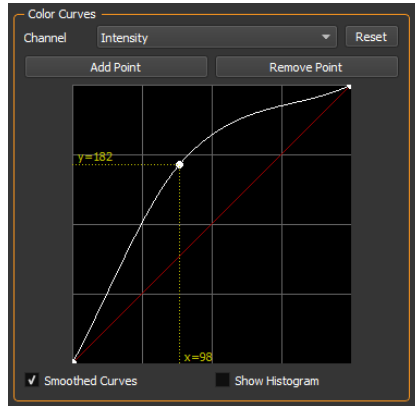
Curves Chart

By default, the color curve chart looks like this:

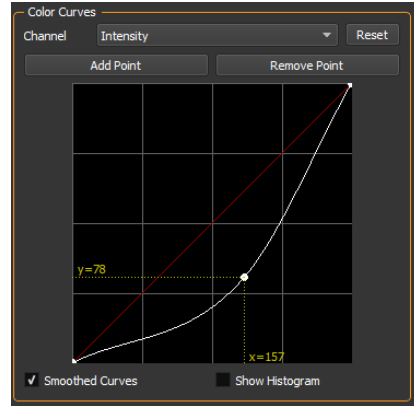
Note: In general, whenever you are manipulating the properties of a video, it is recommended to turn on the histogram so that you can have a good idea of how you are altering the image.



To alter the curves on your video you need to add a point and then alter the location of that point, adjusting the curve and therefore adjusting the underlying intensity of the pixels which correspond to that point. In general, to brighten a dark video, place a point in the middle of the curve and pull the curve upwards.

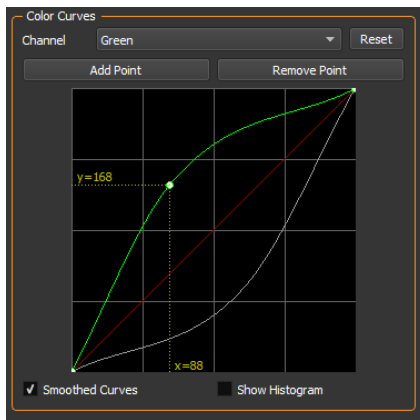


Increasing the mid-range intensity of all color channels, brightening the video

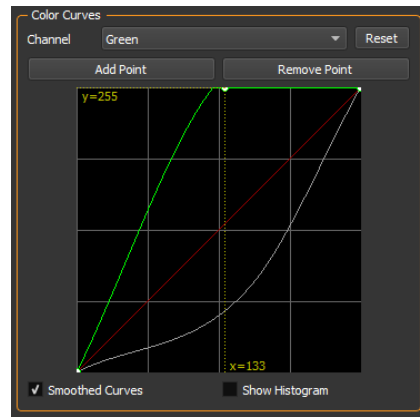


Decreasing? the mid-range intensity of all color channels, darkening the video.

To alter the intensity of a single color on your video, you can isolate that color in your curves channel selection and then just adjust that single color.



Increasing the mid-range intensity of the green channel while darkening the overall intensity of the video brightens and isolates the green regions of the video.



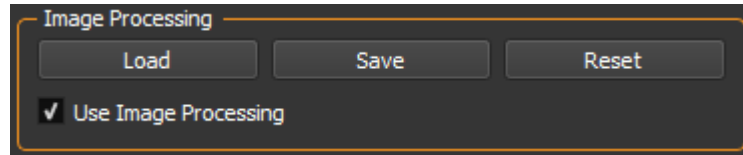
Maxing the mid-range intensity of the green channel while darkening the overall intensity of the video makes all mid and high end green values melt together into one bright green blob.

Add Point

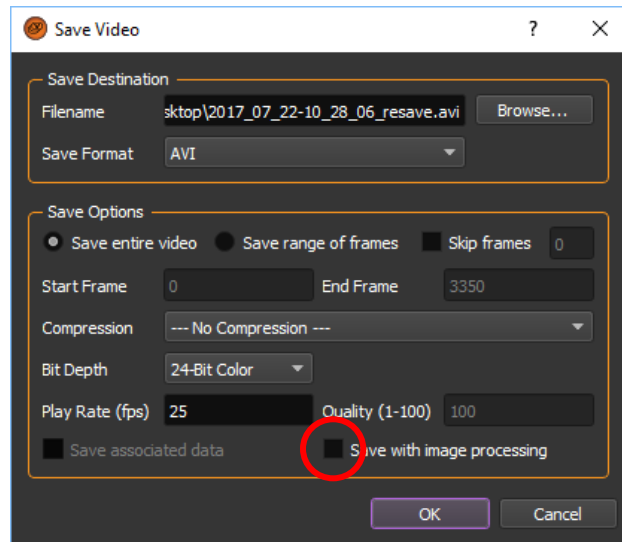
Adding points to your curve chart allows you to dynamically change individual intensities of different portions of your video's channels. To add a point, click on a region of your line and then click **Add Point**. A new point will appear. To adjust this point click and drag it to the new location.

Saving and Loading Processed Video

After adjusting a clip using image processing, or to load a previous image adjustment, there are two methods to save and load your work. An image processing overlay can be saved and loaded with all of the image processing data from an .ixi file by opening the **Image Processing** tab and selecting **Save** or **Load** under **Image Processing**.



Alternately, the video itself can be saved with the image processing embedded, over-writing the previous video's appearance by selecting **Save with image processing** in the **Save As..** window.



Note: Saving a video with image processing can result in lost video data. While image processing can highlight things visible to the naked eye, it is also possible for image processing to remove colors, wash out gradients and meld two tonal values together. While image processing can be invaluable for analysis purposes, it is typically recommended that you save the image processing as a separate file, or keep an unaltered original of any video intended to be analyzed.