

Graide



Color Curves

User Manual

Graide Color Curves User Manual

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Graide Color Curves

Graide Color Curves is a video effect plugin for color correcting and color grading with color curves. Color curves are a visual and intuitive tool for working with color channels. They can be found in many image and video editing programs. They offer a greater range of corrections than color wheels or offset/gamma/gain sliders, can edit all color channels separately, and provide extremely precise control over the result.


Graide Color Curves has several advantages over the Color Curves effect that comes with Vegas™ Pro and Movie Studio:

- **Graide Color Curves** has a **Y'RGB and a HSY' mode**. Your corrections are not limited to the RGB color space but can influence color hue, saturation, and luma as well.

This lets you easily desaturate shadows and highlights, put a soft limiter on the image saturation, reduce all colors except red to gray, and much more.

- It comes with a powerful curve editor that supports zooming and panning, **different curve shapes**, copy/paste, undo/redo, and an option for displaying curves **overlaid or separately**.
- It has native support for correcting with **studio RGB levels**.
- You can **pick a color value** by clicking into the preview window and place curve nodes exactly where they are needed.

The following sections describe the **installation**, the functionality and the **user interface** of the plugin. If you have further questions, comments, or suggestions, please contact me at mwoerner@semw-software.com.

 This documents shows icons as they appear in Vegas™ Pro 16. The icons in other Vegas versions look a little different.

Before you begin

2.1 System requirements





- MAGIX Vegas™ Pro 16, 15 or 14 or Sony® Vegas™ Pro 10, 11, 12 or 13 (64 bit) or Sony® Movie Studio 12 Platinum or 13 Platinum (64 bit)
- Microsoft® Windows® Vista, 7, 8, 8.1 or 10 (64 bit)
- Microsoft® .NET-Framework 4.0 or higher
- CPU with SSE2 (Intel® Pentium® 4/AMD Athlon™ 64 or better)
- 3 MiB free hard disk space

2.2 Installation

Graide Color Curves comes with an automatic setup program, which will install the plugin and register it with Vegas Pro and Movie Studio Platinum. Download and run the setup file from <https://www.semw-software.com> and follow the instructions. Once **Graide Color Curves** is installed, it is available in all supported 64 bit installations of Vegas Pro and Movie Studio Platinum.

2.3 Using the plugin

As a video effect, **Graide Color Curves** can be used in four different contexts:

- As a video event effect, which acts on a video event in the timeline. To add a video event effect, click the *Event FX* icon  on the event.
- As a video track effect, which acts on a video track and thus on all events it contains. To add a video track effect, click the *Track FX* icon  in the track header or select *Track FX* from the track menu .
- As a video output effect, which acts on the video output and thus on all video tracks and events. To add a video output effect, click the *Video Output FX* icon  in the preview window.

- As a media effect, which acts directly on project media. To add a media effect, right-click an item in the *Project Media* window and select *Media FX...* from the context menu.

It is also possible to drag the **Graide Color Curves** item from the *Video FX* window (*View/Window/Video FX* or *View/Video FX*) onto an event, a track, or the preview window.

2.4 Uninstallation

Like most programs, **Graide Color Curves** can be uninstalled in the *Programs and Features* section of the Windows® Control Panel. Select *Graide Color Curves* in the list of installed programs and click *Uninstall*.

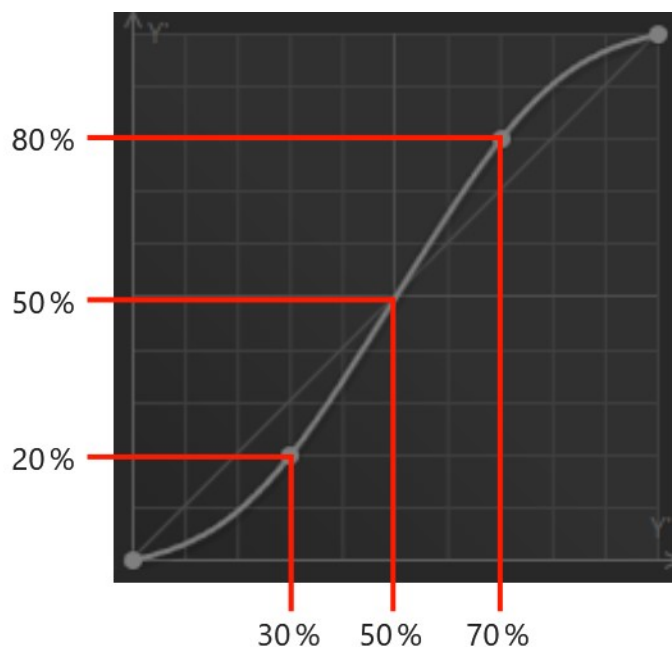
Color correcting with color curves

Color curves are among the most powerful color correction tools and allow for a precise and intuitive correction of color channels.

A color curve is a graphical representation of the input and output values of a color channel. **Grade Color Curves** displays color curves in a two-dimensional coordinate system, in which the horizontal axis represents the input values and the vertical axis represents the output values.

You can determine the output value for a given input value by finding the input value on the horizontal axis and tracing a straight line upwards until it intersects the curve. The vertical position of the intersection point corresponds to the output value.

As an example, the following curve defines an S-shaped relation between the input and output values:



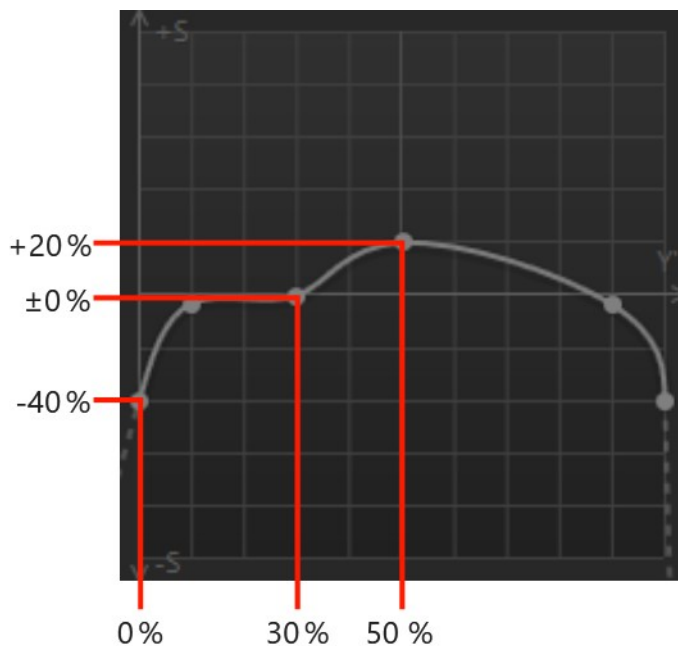
This curve will darken input values between 0 % and 50 %: An input value of 30 % will be mapped to an output value of 20 %. Values between 50 %

and 100 % will be brightened: An input value of 70 % will produce an output value of 80 %.

The default curve is a diagonal from the bottom left to the top right that leaves all values unchanged. The example curve above intersects the diagonal at the input values 0 %, 50 % and 100 %. As a consequence, these values will not be changed by the curve.

3.1 Relative color curves

For some color curves in HSY' mode, the input and output channels are different. The Y'►S curve, for example, changes the saturation based on a pixel's luma (brightness) value. In this case, the vertical axis doesn't directly indicate the output value, i.e. the resulting saturation, but determines how the saturation of a pixel is changed based on its brightness. The neutral line, at which there is no change, is a horizontal line at the center of the vertical axis. Below that line, the saturation is reduced. Above it, the saturation is increased.



For pixels at 0 % brightness, this curve reduces the saturation by 40 percentage points. At a brightness of 30 %, the saturation is unchanged. At a brightness of 50 %, the saturation is increased by 20 percentage points.

- i** Relative color curves are additive, i.e. a curve value of +10 % increases the output value by 10 percentage point, e.g. from 10 % to 20 % and not by 10 % of the original value (from 10 % to 11 %).

3.2 Y'RGB and HSY'

Graide Color Curves operates in one of two color models: **Y'RGB** (brightness, red, green, blue) or **HSY'** (hue, saturation, brightness). You can switch between these two models with the **mode buttons**.

The **Y'RGB** mode splits the image into four color channels: brightness, red, green, and blue. The brightness corresponds to the vertical position of the signal on a waveform monitor. It is derived from the values of the red, green, and blue channels, i.e. every change to the brightness curve could also be represented as a change to the red, green, and blue curves. However, being able to control the image brightness independently of the individual color channels often simplifies things.

Y'RGB mode uses four color curves: One each for brightness, red, green, and blue.

The **HSY'** mode splits the image into three color channels: hue, saturation, and brightness. Hue determines the general character of a color and places it on a color wheel that ranges from blue to violet, red, yellow, green, and cyan back to blue. It corresponds to the color angle on a vectorscope. Saturation determines how different a color is from gray. High saturation indicates vibrant colors, low saturation pale colors. On the vectorscope, saturation corresponds to the distance from the center. The brightness, as in Y'RGB mode, corresponds to the vertical position on the waveform monitor.

- i** Hue is a cyclic value. The position on the color wheel has no clearly defined minimum or maximum value and is thus given in degrees (°) instead of in percent or absolute values.

- i** HSV, HSL, and the HSY' model used by **Graide Color Curves** are perception oriented color models, i.e. their values relate to human color perception rather than to physical quantities like those in the RGB model.

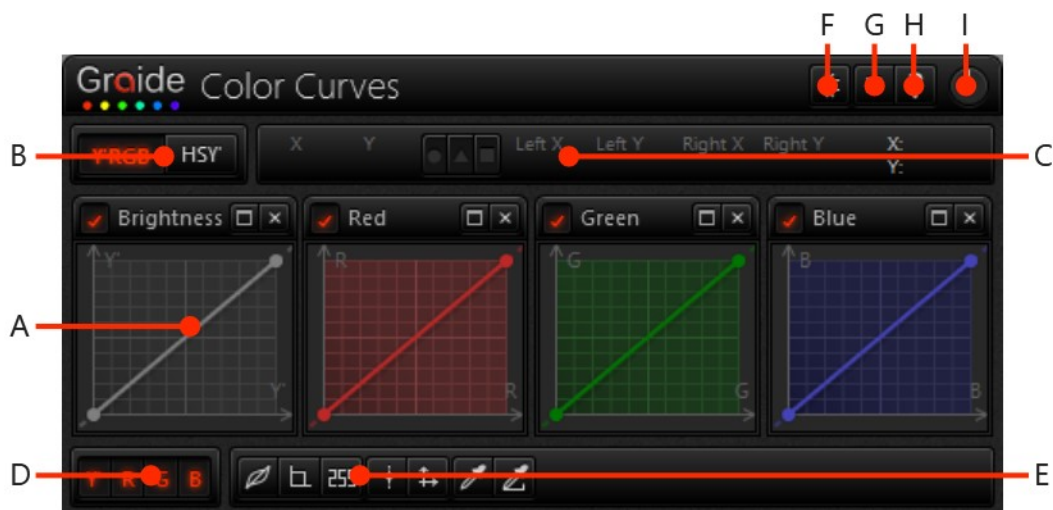
There are different methods of mapping an RGB value to a hue, a saturation, and a brightness value. **Graide Color Curves** follows the ITU-R Recommendation BT.709 for the HDTV standard. Therefore, its hue, saturation and brightness (luma, Y') values are different from those in the HSV and HSL models and also from those of the Vegas Pro videoscopes, which follow the ITU-R Recommendation BT.601 (SDTV).

HSY' mode uses a total of nine color curves, one for each combination of the three color channels. You can both process one channel separately (e.g. the output brightness based on the input brightness) and one channel based on the value of another (e.g. the saturation depending on the brightness). This lets you create many different corrections and looks.

The user interface

The user interface is displayed when you first add a **Graide Color Curves** effect or reopen the FX window at a later time. This is where you set all parameters of the correction.

- i** In Vegas Pro 10, the user interface is located under the *Custom* tab in the FX window.



A: Curve window, **B:** Mode, **C:** Coordinates bar, **D:** Curve selection, **E:** Command bar, **F:** Studio RGB mode, **G:** Settings, **H:** Help, **I:** Effect strength.





- i** Depending on the available space, the curve windows may be arranged differently.

4.1 Curve window

One or more curve windows are displayed at the center of the user interface. The **curve selection** determines which curves are visible.

4.1.1 Title bar

The title bar at the top of each curve window identifies the curve(s) this curve window displays and contains the following buttons:

Button	Description
	The <i>Enable</i> button enables and disables the curve. Disabled curves do not influence the effect output. You can easily judge the effect of a single curve on the overall result by disabling it temporarily.
	The <i>Maximize</i> button hides all other curve windows. This button is not available if this already is the only visible curve window.
	The <i>Hide</i> button hides this curve window. This button is not available if this is the only visible curve window.
	The <i>Restore</i> button resets the visibility of all curves to the state before last maximizing a curve window. This button is only available if a curve window has been maximized.

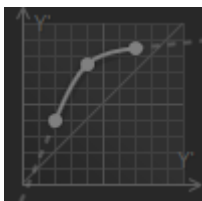
4.1.2 Curve shapes

In **Graide Color Curves**, curves are defined as a sequence of node points. Each node has an X and a Y position and uses one of three curve shapes:

Curve shape	Description
Smooth (●)	Smooths the curve at this node.

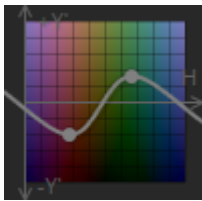
Linear (▲)	Makes this node a corner point, with the curve pointing straight towards the neighboring nodes on both sides.
Manual (■)	Shows tangent lines at this node that can be edited manually.

4.1.3 Curve extension



For input values outside the range defined by curve nodes, **Graide Color Curves** continues the curve along the tangents at those nodes. The curve windows displays these continuations as dashed lines.

4.1.4 Cyclic curves



Since hue is a cyclic value (measured in degrees), the Hue, Hue►Brightness and Hue►Saturation curves do not have continuations. Instead, **Graide Color Curves** connects their last node back to the first to always cover the entire value range from 0° to 360°.

4.1.5 Selecting nodes

Select nodes to view their parameters in the **coordinates bar** or to edit multiple nodes simultaneously.

Function	Action
Select single node	Click the node.
Add node to selection	Hold Shift and click the node.
Deselect node	Hold Ctrl and click a selected node.

Select multiple nodes	Click and drag a rectangle that encloses the nodes to be selected.
Select all nodes	Double-click the background of the curve window (i.e. not on a node or the curve). <i>or</i> Right-click in the curve window and select <i>Select All</i> from the context menu. <i>or</i> Press Ctrl+A.
Deselect all nodes	Click the background of the curve window (i.e. not on a node or the curve).

4.1.6 Edit nodes

Function	Action
Move node	Drag the node to a new position. <i>or</i> Select the node and use the cursor keys to move it. Hold Ctrl to reduce the step size. <i>or</i> Select the node and edit its position in the coordinates bar .
Add a node	Double-click on the curve. <i>or</i> Hold Shift and click on the curve. <i>or</i> Click on the curve and drag the cursor to a new position.

Delete a node	<p>Right-click the node and select <i>Delete</i> from the context menu.</p> <p><i>or</i></p> <p>Hold Alt and click the node.</p> <p><i>or</i></p> <p>Select the node and press Del.</p>
Change the curve shape at a node	<p>Right-click the node and select an item from <i>Curve Shape</i> in the context menu.</p> <p><i>or</i></p> <p>Select a node and click one of the curve shape buttons in the coordinates bar or press S (smooth), L (linear) or M (manual).</p>
Edit node tangent (manual curve shape)	<p>Drag one of the red circles at the tips of the curve tangent to a new position. Hold Ctrl to move the left and right tangent independently.</p> <p><i>or</i></p> <p>Select the node and edit the tangent in the coordinates bar.</p>
Cut or copy a node	<p>Right-click a node and select <i>Cut</i> or <i>Copy</i> from the context menu.</p> <p><i>or</i></p> <p>Select the node and press Ctrl+X to cut it or Ctrl+C to copy it.</p>
Paste a node	<p>Right-click in the curve window select <i>Paste</i> from the context menu.</p> <p><i>or</i></p> <p>Click into the curve window and press Ctrl+V.</p>

Reset a node to its default position

Right-click the node and select *Reset Node* from the context menu.

or

Double-click the node.

Reset a curve to default

Right-click in the curve window and select *Reset Curve* from the context menu.

4.1.7 Change view

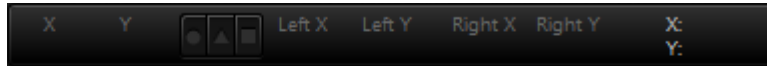
Function	Action
Pan view	Click and drag with the middle mouse button. <i>or</i> Hold Shift+Ctrl and drag with the left mouse button over the background of the curve window (i.e. not on a node or the curve).
Zoom in or out	Use the mouse wheel. <i>or</i> Click into the curve window and press + or -.
Reset view to default	Right-click in the curve window and select <i>Default View</i> from the context menu. <i>or</i> Click into the curve window and press Ctrl+0.

4.2 Mode



The mode buttons switch between the **Y'RGB and HSY' modes**. The mode determines which color curves are available in the **curve selection**.

4.3 Coordinates bar



The coordinates bar displays the coordinates and the curve shape of the selected nodes and lets you edit them directly. It contains (from left to right):

- The x and y coordinates of the selected node. If multiple nodes are selected, their coordinates are averaged.
- The curve shape of the selected node: smooth (●), linear (▲) or manual (■). If multiple nodes with different curve shapes are selected, no button will be pressed. Clicking any curve shape button will then set all selected nodes to that curve shape.
- The x and y coordinates of the left and right tangent. If multiple nodes are selected, their tangent coordinates are averaged. If you edit any value here, the tangents of all selected nodes will be set to that value.
- The x and y coordinates of the mouse cursor if it is over a curve window

4.4 Curve selection



The curve selection determines which curves are currently shown. The fewer curves you select here, the more room will be available for the individual curve windows.


- i** Hidden curves still influence the effect result. You can prevent a curve from affecting the result by disabling it using the **Enable** button in the title bar of its curve window.

There are four curves in Y'RGB mode and nine in HSY' mode.

Function	Action
Switch curve visibility	Click the corresponding curve button. <i>or</i> Press the corresponding number key from 1 to 4 (Y'RGB)/1 to 9 (HSY').
Show a single curve	Hold Ctrl or Shift and click the corresponding curve button. <i>or</i> Press Ctrl and the corresponding number key from 1 to 4 (Y'RGB)/1 to 9 (HSY'). <i>or</i> Right-click the curve button and select <i>Only This Curve</i> from the context menu.
Show all curves	Press the 0 number key. <i>or</i> Right-click one of the curve buttons and select <i>All Curves</i> from the context menu.

4.5 Command bar

The command bar contains these buttons:

Icon	Description
	(Y'RGB mode only) Enables or disables the overlay curves mode. When this mode is active, all four Y'RGB curves will be displayed in the same curve window. Curves disabled in the curve selection will be appear dashed in the background.



Enables or disables the **fixed aspect ratio** mode.

When this mode is active, curves will be displayed in a uniformly scaled (square) coordinate system. When it is inactive, the aspect ratio of the coordinate system matches that of the curve window.



Enables or disables the **8 bit units** mode.

When this mode is active, the brightness, red, green, and blue channels will be measured in units from 0 to 255 (16 to 235 in **studio RGB mode**) instead of percent.



Enables or disables the **snap to grid** mode.

When this mode is active, curve nodes will snap to integral coordinates when dragging them with the mouse. Hold Shift while dragging to override this setting and enable or disable snapping temporarily.



Enables or disables the **lock axis** mode.

When this mode is active, curve nodes can only be moved either horizontally or vertically. Hold Shift while dragging to override this setting and enable or disable locking temporarily.



Picks a color value from the VEGAS preview window.



Picks a color range from the VEGAS preview window.

4.6 Picking a color/color range

The *pick color* and *pick color range* features let you add curve nodes that match a specific image area of the VEGAS preview window.

Pick color inserts a single node at the average value of the marked area. *Pick color range* inserts one node at the minimum and one at the maximum value of the marked area.

Follow these steps:

1. In the **curve selection**, enable all curves that you want to insert nodes into.
2. Click the **Pick color** or **Pick color region** button in the command bar. The mouse cursor will take the shape of a pipette. Vertical lines in the curve windows show, which curve position corresponds to the color value beneath the mouse cursor.
3. Left-click in the VEGAS preview window and drag the cursor over the region you want to pick.
4. Release the left mouse button to insert the corresponding nodes into all visible curves.

4.7 Studio RGB mode

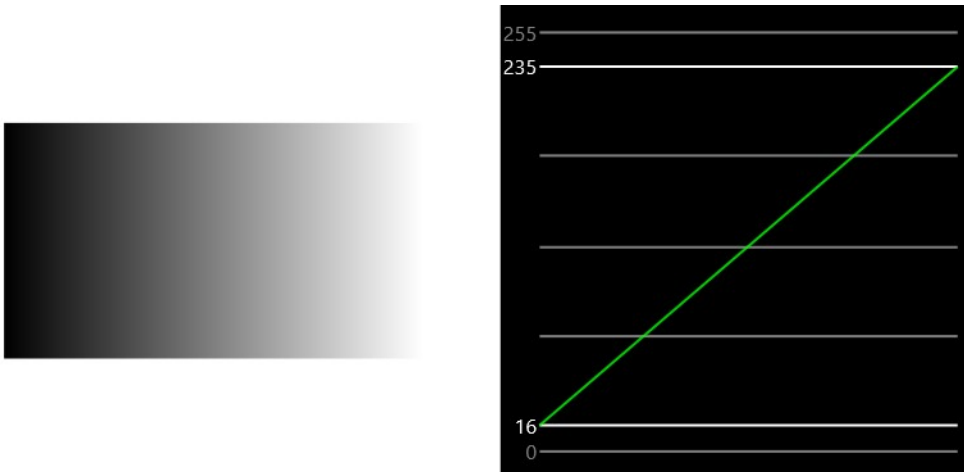


The **studio RGB mode** button enables or disables studio RGB mode. Enable this mode if your input signal uses studio levels.

Digital color processing often measures the intensity of a color channel in the 0-255 range (for 8 bit quantization). 0 represents the lowest possible intensity (black), while 255 corresponds to the maximum intensity. This convention is called “computer RGB”, “computer levels”, or “full swing”.

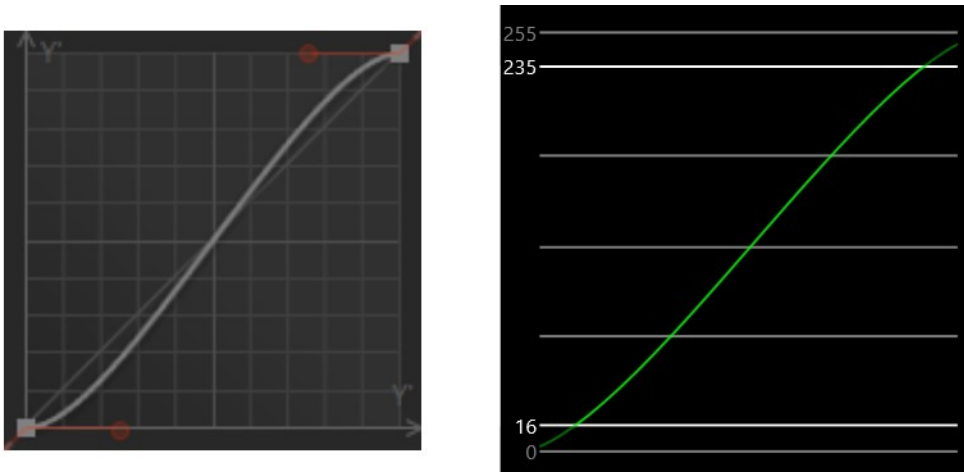
In video processing, however, there is another common model that reserves some values below and above the nominal value range and measures intensity only between 16 and 235. This is known as “studio RGB”, “studio levels”, or “studio swing” and is used in video formats such as AVCHD or DVD.

When color correcting using curves, it is important to know the legal value range in order to correctly place the black and white points. Consider the following example:



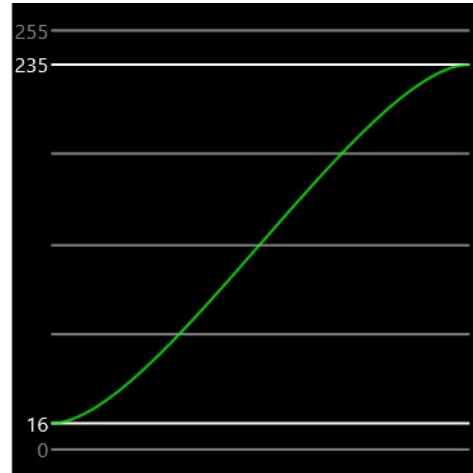
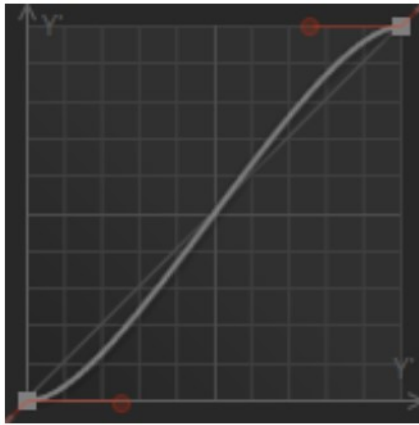
The left image shows a color gradient from black to white. The right image shows the corresponding waveform monitor display for a signal using studio levels: The color values begin at the nominal minimum value 16 and increase to the nominal maximum value 235.

If you try to increase the contrast of this color gradient in **Graide Color Curves** with an S-shaped color curve and studio RGB mode disabled, you will get this result:



As **Graide Color Curves** operates in computer RGB mode by default, the value 16, even though it represents black in this image, will be darkened and the value 235, even though it represents white, will be brightened. As a result, the darkest and lightest parts of the image will be brought outside the legal range and may be clipped.

If you enable studio RGB mode, however, **Graide Color Curves** will perform all necessary conversions to ensure a correct result:



4.8 Settings



The **Settings** button opens the settings window, where you can change the program language and unlock the **trial version**.



4.9 Help



The **Help** button opens the program help. Use the table of contents at the left side of the help window to jump to a topic. You can interact with the help window in the following ways:

Function	Action
Zoom	Use Ctrl+mouse wheel. or Press Ctrl++ or Ctrl+-.
Reset zoom to normal	Press Ctrl+0.
Find text	Press Ctrl+F.

Graide Color Curves also has a context sensitive help feature, which takes you directly to the description of a user interface element. Follow these steps to access the context sensitive help:

1. Select *Help/What's This* in the main window of VEGAS or Movie Studio.
or
Click the *What's This Help* icon  in the VEGAS or Movie Studio toolbar.
or
Press Shift+F1.
or
Right-click the *Help* icon .
A question mark will appear next to the mouse pointer.
2. Click on an element of the **Graide Color Curves** user interface.

4.10 Effect strength



Using the **Effect strength** knob, you can control how much the effect influences the input signal. With the default value of 100%, the effect processes the input normally. Values below 100% reduce the effect. At a value of 0%, the input image remains unchanged. Values above 100% increase the influence beyond the normal effect.

To change the value of the effect strength knob, click and drag it with the left mouse button or move the mouse pointer over it and use the mouse wheel. The knob shows a numeric display of its current value while the mouse pointer is over it.

Trial and full version

Right after being installed, **Graide Color Curves** will act as a trial version. The trial version has a time limitation but is otherwise unrestricted. You can check the remaining trial time in the *About* section of the *Settings* window.

After purchasing a license, you will receive a license key to unlock the trial to a full version. Click the *Unlock* button in the *About* section of the *Settings* window to enter your license key. If your trial version has already expired, you will be presented with an unlock option right after opening the **Graide Color Curves** user interface.