



## **Reindeer Graphics™ Wide Histogram**

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## **Introduction**

Our Wide Histogram plug-in was written to give our users more information about the histogram for 16-bit images. The histogram in Photoshop 7 is inadequate for showing the statistics for the increased dynamic range of 16-bit images. While Photoshop CS improves this immensely, it still falls short in several areas.

The most glaring inadequacy is the width of the histogram in Photoshop. Even though Photoshop CS now supports 16-bit operations throughout the program, the histogram is still only 256 pixels wide. 16-bit channels in Photoshop support 32768 distinct levels. This means that each "bin" in the Photoshop CS histogram actually combines 128 distinct levels. In 8-bit mode, each "bin" represents only 1 distinct level. While it is not feasible to use a 32768 pixel wide histogram, we have found that a slightly wider histogram reveals details about the image that cannot be seen in a narrow histogram. We also include a hue and saturation histogram, which Photoshop's Histogram palette do not have.

For the scientific users who are working with 16-bit images, we have included an export function in the Wide Histogram, that writes the histogram data out to a text file on disk, as well as some statistics on the histogram itself.

## **FAQ**

Q.) How do I install it?

A.) Simply drag the plug-in file to the Plugins folder in your Adobe Photoshop folder. The Photoshop folder is typically located inside the Program Files folder on the PC, and in the Applications folder on the Macintosh.

Q.) I installed Wide Histogram, but it doesn't show up in my Filters menu.

A.) The Wide Histogram plugin will appear in the OPTIPIX submenu. If it is not there, check to make sure you don't have two copies of Photoshop on your machine. Most of the time, this is because the plug-in is not in the Plug-ins folder for the copy of Photoshop that is running.

Q.) Why don't the keyboard shortcuts work on the PC?

A.) This is a known bug that we will address in a future release.

Q.) I don't understand the Export Data function.

A.) Export Data writes out the raw histogram data that we display into a text file suitable for import into Excel, SAS, or any other statistics package. Read section 4 of this document for more detail.

Q.) I really wish Wide Histogram was a palette like the built-in Histogram palette. Why didn't you do it that way?

A.) We'd like to see that too. Currently, Adobe does not make it possible for 3rd party developers to create palettes.

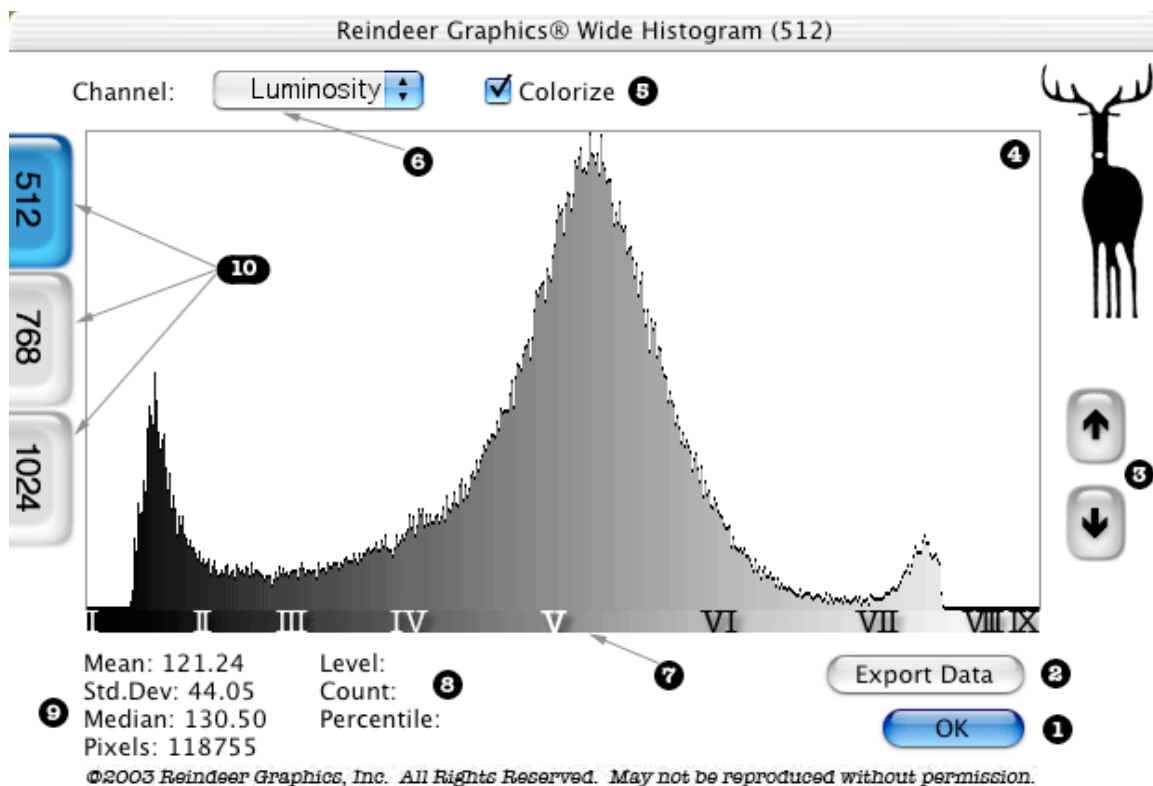
Q.) What is up with a grey value of 125.25? How can you have a fraction of a grey level?

A.) Wide Histogram reports 16 bit grey values scaled from 0-255, so that they can be compared easily to 8 bit values. This differs from Photoshop, which reports 16 bit values as 0-32768.

Q.) This is the same histogram as in Photoshop, the bars are just wider!

A.) You're looking at an 8-bit image. Try it again with a 16-bit image.

### The Wide Histogram Dialog



This is the default Wide Histogram dialog as it appears in Luminosity mode. The various components of the dialog have been labelled.

(1) OK button. The Wide Histogram plug-in makes no changes to your image. Simply clicking OK or hitting the Return key will close the dialog.

(2) Export Data. Clicking this button will bring up a file dialog allowing you to choose where you want the histogram data saved. The data are exported as tabbed text, suitable

for import into Excel or any other spreadsheet. The data saved are in different formats depending on the Channel mode selected; this is described in more detail in the section on exporting data.

(3) Zoom buttons. These buttons change the scale of the histogram, allowing you to explore the histogram data at different scales. Details in the non-peak areas of the histogram can be revealed with the zoom function. On the Macintosh, you can use the up/down arrow keys as shortcuts for the zoom buttons.

(4) The histogram display. The histogram data are graphed here. The width of this display is controlled by the width tabs (10), the scale is controlled by the zoom buttons (3), and the mode that is displayed is controlled by the Channel Menu (6). The display will be in color if the Colorize control (5) is ticked.

(5) Colorize control. When ticked, the histogram display will be in color (greyscale for the Luminosity mode). This box is on by default.

(6) Channel Menu. The channel whose histogram is currently displayed is shown here. You can select which mode to display from this menu. Wide Histogram supports 7 different modes: RGB, Red, Green, Blue, Colors, Hue, Saturation, and Luminosity. These are described in the following section on the Channel Modes.

(7) Legend bar. The legend bar displays the scale for each of the modes. For RGB, Red, Green, Blue, and Colors, the scale goes from 0-255 with fractions. For Hue, the scale is the hue angle from 0-359. For Saturation, the scale is 0-100%. In Luminosity mode, the Legend bar displays the Zone system labels (Zones I-IX). On the Macintosh, you can use the following keyboard shortcuts:

- RGB            (~)
- Red            (1)
- Green        (2)
- Blue          (3)
- Hue           (4)
- Saturation   (5)
- Luminosity   (6)

(8) Selection statistics. When a portion of the histogram is selected, these fields show information about the selection, including the range of values selected, the number of pixels in the selection, and the percent of the image selected.

(9) Image statistics. This information is global information about the histogram, including the mean and median of the pixel values in the selected channel, the standard deviation, and the total number of pixels.

(10) Width tabs. These tabs control the width of the histogram. The numbers in the tabs are the pixel widths of the histogram display. The wider the histogram is, the more resolution there will be for the pixel values. (At 512 pixels wide, each histogram bar

represents 64 levels; at 1024 pixels wide, each bar represents 32 levels.) You can use the following keyboard shortcuts on the Macintosh to switch between widths:

- 1024 pixels ( [ )
- 768 pixels ( ] )
- 512 pixels ( \ )

## Wide Histogram Channel Modes

RGB: The RGB mode superimposes the histograms for the red, green, and blue channels into a single histogram. Note that the peak heights for each channel are scaled, so that the relative peak heights are not meaningful.

Red, Green, Blue: Shows the appropriate color channel of the image. Note that 16-bit values are scaled to be from 0-255 with an appropriate fraction.

Hue: Shows the distribution of hue angles in the image. The legend bar displays the angle in degrees.

Saturation: Shows the distribution of pixel saturations in the image. The legend bar displays saturation from 0-100%.

Luminosity: Displays the luminance distribution in the image. The legend bar shows where the particular luminance falls in the Zone system.

## The Export Data function

The Export Data function in Wide Histogram is designed for users who need to get to the raw histogram data for further analysis. Users who need to analyze and compare raw histogram data will find this feature particularly useful, as it allows the use of any statistics package that is convenient.

The Export Data function exports different data depending on the mode and current width. The current width of the image changes the resolution of the data along the x-axis. The mode changes what data is reported along the x-axis.

Mode	Column Data
RGB, Colors	pixel values 0.0-255.0, # of Red, Green and Blue pixels
Red, Green, Blue	pixel values 0.0-255.0, # of pixels
Luminance	luminance in 0.0-100.0%, number of pixels
Hue	hue angle in degrees, number of pixels
Saturation	saturation in 0.0-100.0%, number of pixels

**Contact information**

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