

Manual



UNLIMITED FILTERS



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i. Introduction

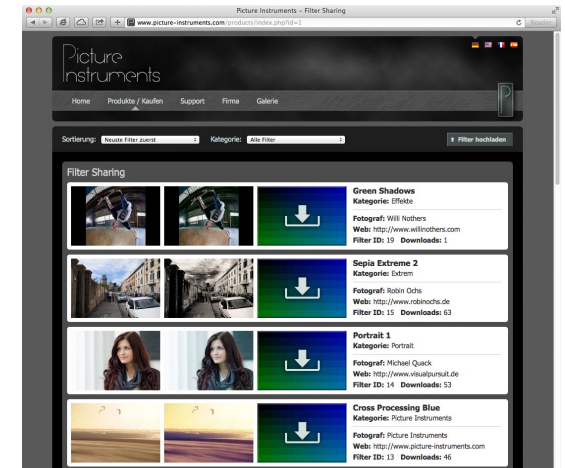
Unlimited Filters is a software that you can use in various ways. But those different types of usage certainly don't exclude each other.

- a. You want to use Unlimited Filters simply as a filter-app. Using filters other users have created and uploaded to the filter sharing area on our website is enough for you as you don't want to create your own filters or copy filters from other applications. In this case you can skip items 1 and 2.
- b. You use Unlimited Filters as the main software for looks. You copy interesting filters from mobile and from desktop applications and occasionally you create your own filters. When you search for a look for a picture you have all filters in one application and you can apply any filter in no time.
- c. Unlimited Filters is your nerve center for filters. Wherever the filters originated, you like to use the same filters in Photoshop as well as in video editing software. You like to be completely flexible when you create filters. You are happy that you can create a filter that you want to apply to a video in Photoshop or Lightroom, which you can convert to the 3D LUT format in Unlimited Filters. Whenever you feel like experimenting around you can even take a picture of a mobile filter with your analog camera and apply the effects of the analog development process to digital images and videos. Of course you have to make sure that the color patches in the scan must be fitted to the position of the patches in the original filter. As soon as you have familiarized

yourself with Unlimited Filters workflow you realize that you have a very powerful and flexible tool at your disposition.

ii. Filter Sharing

Filter sharing is a platform on our website (navigate to "products") where you can share filters you have created yourself with other users. If Unlimited Filters is new to you, you can download a great number of filters there and get started with filtering right away.



You can find the filter sharing area after clicking on the following link: <http://www.picture-instruments.com/products/index.php?id=1>

1. The Desktop Filter

Use this command button to save a neutral desktop filter to your computer.



What is a neutral filter anyways?

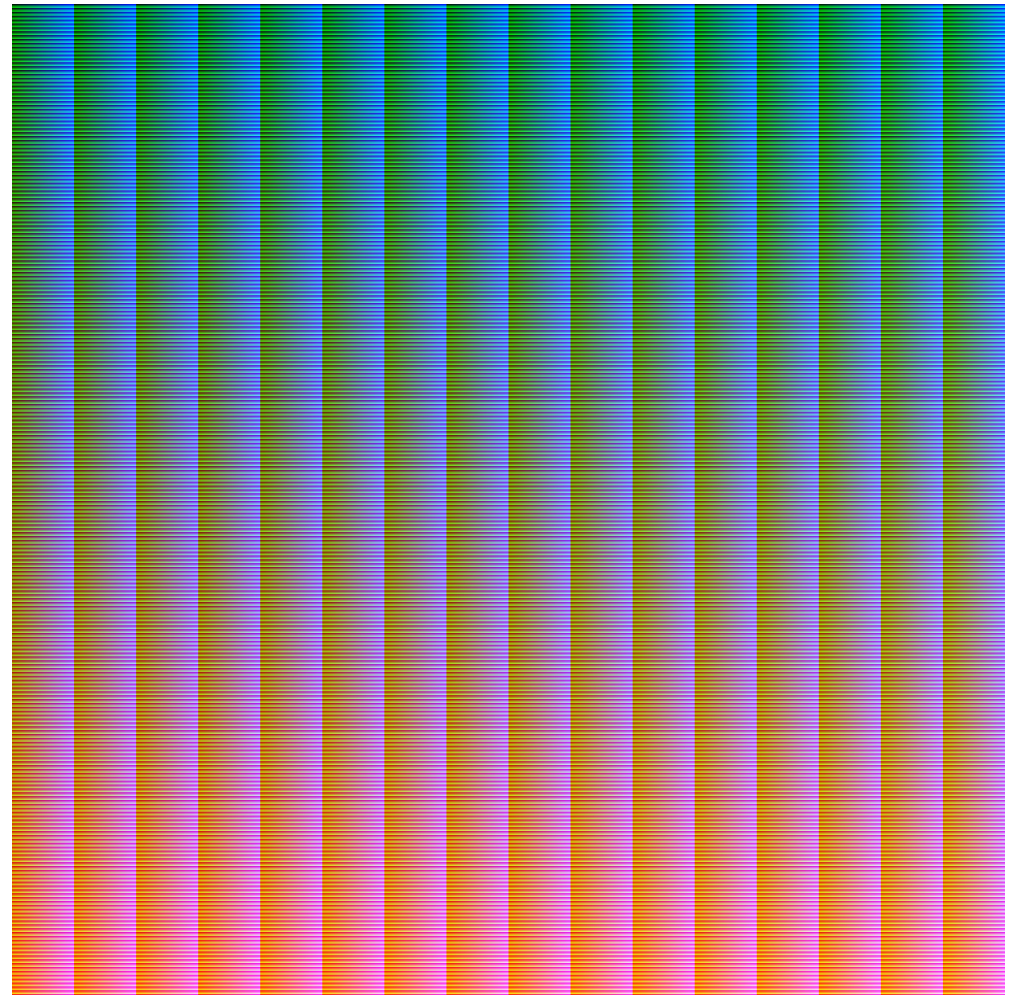
The neutral desktop filter can be viewed as a color table containing each color of the RGB model once in 8-bit per channel. To make sure that you can edit this filter in any picture editing software we don't save it as a table but as an image.

Since our desktop filter contains every single RGB color value only once, and in only one pixel at that, the desktop filter cannot be saved by applying a lossy compression (like JPG), since the compression changes many color values.

The pattern of the color values within a neutral filter is systematic to make sure that Unlimited Filters remembers which initial value the current color value (pixel) on a specific position was based upon after editing the filter. Line by line from left to right this would mean the following:

```
R,G,B = 0,0,0 ; 0,0,1 ; 0,0,2 ; ... ; 0,0,255 ; 0,1,0  
; 0,1,1 ; 0,1,2 ; ... ; 0,1,255 ; 0,2,0 ; 0,2,1 ;  
0,2,2 ; 0,2,3 ; 0,2,255 ; ... ; 0,255,255 ; 1,0,0 ;  
1,0,1 ; 1,0,2 ; ... ; 255,255,255
```

Viewed as a picture this would look like so:



To create your own filter or copy one from another application you have to open the neutral filter in any application. Like with any other picture you can then apply various edits, corrections and changes to the neutral filter that affect the brightness, the color and the saturation of individual pixels. These can be tone curves, selective color corrections, tonal value corrections, black and white conversions, changes in

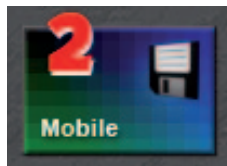
saturation and dynamics and many more. You can also simply apply a preset filter from another application to it. Since our neutral desktop filter contains all colors of an RGB image in 8-bit per color channel even very subtle corrections will be captured. The result of your edits is now your filter for Unlimited Filters. The difference of the individual color values in the filter you have edited define the new filtering effect which you can apply to any image with just one click after importing it into Unlimited Filters.



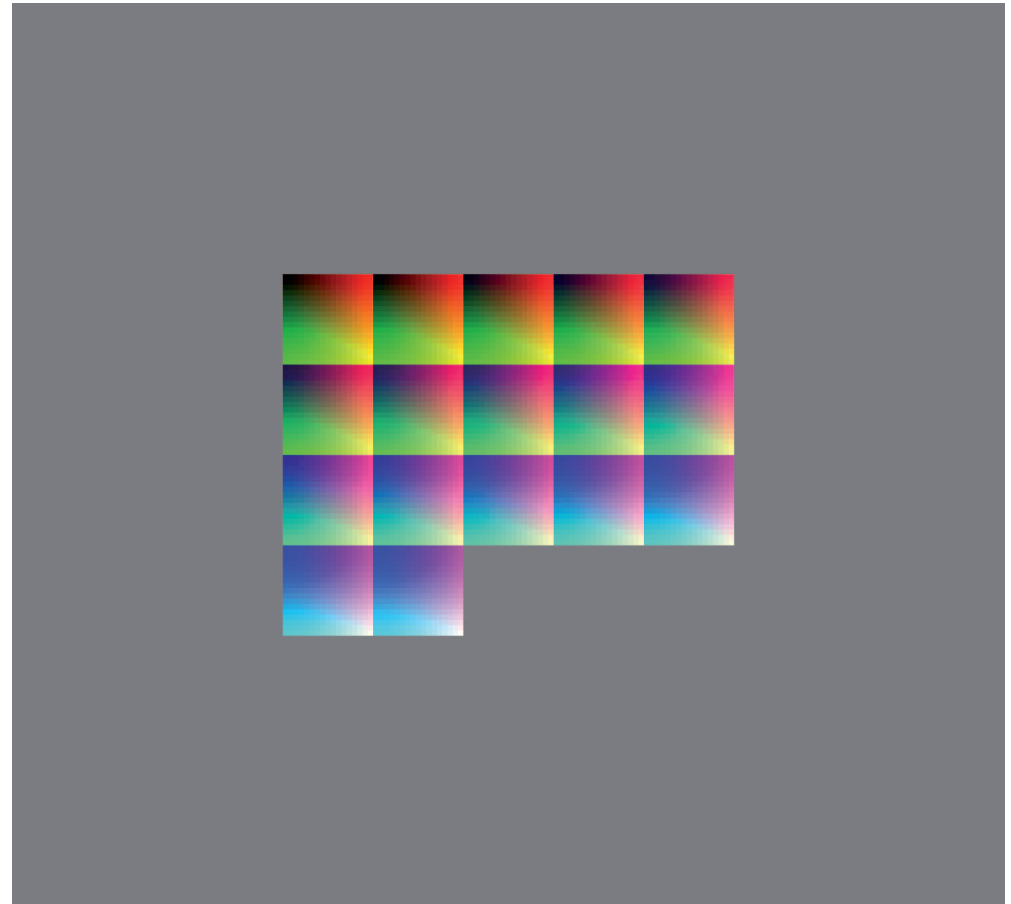
Note: Changes in sharpness (i.e. micro contrasts) or other localized adjustments (i.e. vignettes or gradients) change the color value of pixels that happen to be located at that specific point by coincidence. Since the color values in our filters are arranged systematically, these types of edits usually cause artifacts. If you are not 100% sure that your edits of the filter cause no localized changes please use the mobile filter which is much more resilient in this respect (within certain limits). Learn more about this in the next chapter.

2. The Mobile Filter

The mobile filter is generally similar to the desktop filter. Here are the differences in the mobile filter:



- a. There is a large grey area around the color patches. Many filter apps contain vignettes as a fixed feature, which oftentimes can't be deactivated. To make sure that the local shading of the edges caused by the vignette doesn't darken color values that are



coincidentally located in this area, Unlimited Filters simply ignores the entire grey area when loading the filter.

- b. Every color value within that filter has a size of 64 (8 x 8) pixels. The mobile filter is oftentimes used in mobile apps, which can only process JPGs. The JPG algorithm is good at compressing blocks of 8x8 pixels. That is why we have decided on this block size per color value. Upon importing a mobile filter into Unlimited Filters, the software calculates the average color value of each 8x8 pixel block and

considers it as one color value. Many filters and presets contain automatic sharpness or blur effects. If those change the edges of said 8 x 8 pixel blocks, the effects on the entire block are usually negligible and cause no artifacts. Over exaggerated effects of this kind will become visible from a certain degree on. Yet according to our experiences, in many cases the tolerance level is surprisingly high.

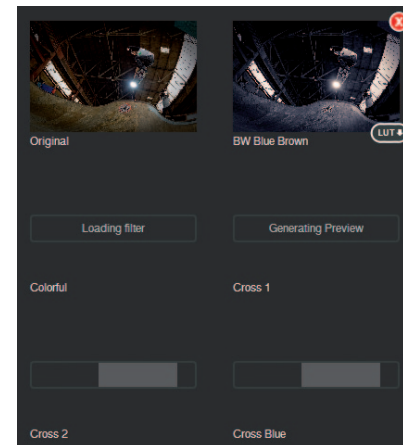
- c. Since every color value in the mobile filter is significantly larger than in the desktop filter, the mobile filter only contains every 17th color value on the R, G and B axis anymore (0,0,0; 0,0,17 ; 0,0,34 ; 0,0,255 ; 0,17,0 ; ... ; 255,255,255). The values located in-between will be interpolated by Unlimited Filters. On the one hand the resulting differences in comparison with the desktop filter are marginal and on the other hand those differences cannot always be judged as better or worse. This is why in most cases we only recommend the mobile filter.



Note: If you want to create your own filters instead of using a preset with features you already know we recommend the use of a reference image on a separate layer. If you are happy with your settings you can delete the reference image and save the filter. In the next step (item 3) you can import it then.

3. Import Filters

Use this feature to import a desktop or mobile filter you have created yourself or downloaded from the filter sharing area of our website. You can import one or several filters simultaneously. The name of the file is automatically used as the name for the filter. Filters you have selected



for import will appear as a placeholder with a status bar in the filter overview until the import is completed (item 5). If the selected file is not a valid filter file, the placeholder will display a black hatching. If you place your mouse cursor over this placeholder an error message will be displayed. You can delete the placeholder of

any file that can't be imported via the red button containing the X.



Note: You can also forego the import of the filters via the control button and copy filters directly to the folder containing the filters (or delete them). You can set the active folder containing your filters in the settings (item 10). Added or deleted filters will automatically be updated in the filter preview.

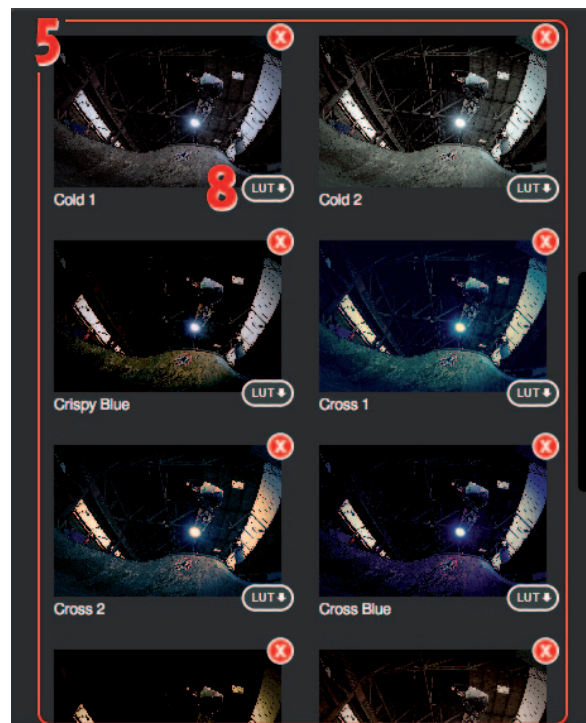


Tip: Use several subfolders to categorize your filters. If you want to work with another filter palette you simply have to go to the settings and change the active folder for your filters. Thanks to the automatic surveillance of the active filter

folder it is possible to copy your filters back and forth, whether the software is running or not. Unlimited Filters will install and de-install all of your filters automatically.

4. Load and Save Images

Use the folder symbol to load an image from your hard drive. Use the arrows to navigate to the previous or next image within the same folder. When you are finished editing your image in Unlimited Filters, you can save it with the disc image. Choose the format for your edited images in the settings.



5. Apply Filters

All filters available in Unlimited Filters can be applied to the preview thumbnails with one click. The thumbnails show a preview of the effect you have selected on the basis of the image that is currently open.

6. Intensity of the Filters



Depending on the colors and color values of a specific image, the same filter can have different effects. Use the intensity dial to determine the strength of the effect.

8. Vignette

If you use Unlimited Filters not only to manage your filters and to export their LUTs but also to edit your pictures you can apply a vignette in addition to the filter here. The controls (from top to bottom)



are responsible for: color (black or white) and intensity, outer radius of the

transition area, inner radius of the transition area. No changes will apply to the inside of the inner radius. The effect of the vignette will be continuous outside of the outer radius.



Note: Please note that neither the vignetting nor the intensity of the filter will be included in the LUT-export.

8. LUT Export

If you want to export a filter you have created yourself or obtained in another way from Unlimited Filters to another software like Photoshop, After Effects, Premiere, Final Cut Pro X etc. as a LUT you can always do that via the LUT



control next to the respective filter. You can select between

the formats .3dl and .cube in the LUTs dialog window. Read more on 3D LUTs in the annex (item 13).

9. Compare Original/Filtered

You can compare the original and the edited image by clicking on this button or clicking on the image with the right mouse button.



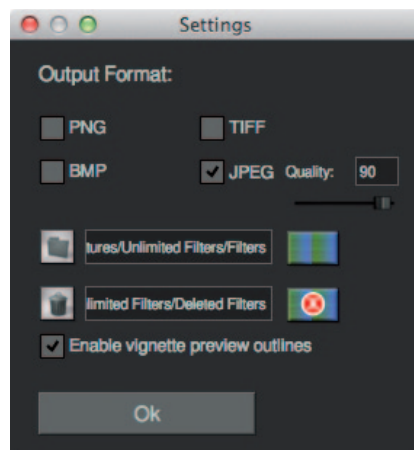
10. Settings



In the settings you can select the formats in which you want to save your edited images (multiple selections are possible). Here you can also select the paths to the folders where you want to save your current filters as well as those you have deleted by pressing on the red X. You can also select whether you want to display boundary lines when you work with vignettes.



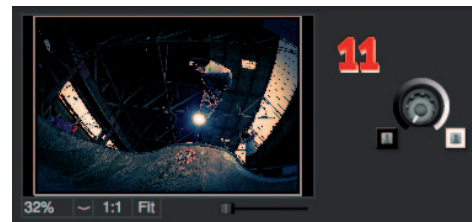
Note: Selecting the path to a folder lets you manage your filters in a very flexible way and we would like to go into more detail on that. Unlimited Filters actively monitors the folder where you store your filters. This means that whenever you copy filters to this folder while the software is running, the filter will be imported immediately. If the software is not running any newly added filters will be recognized and imported upon starting the software. If you delete filters from this folder manually, they will automatically be removed from Unlimited Filters.



This procedure enables you to categorize your filters into different folders on your hard drive. If you want to load a set of filters into Unlimited Filters, simply select a different active folder in the settings and all previews in the software will be updated automatically.

Unlimited Filters will move all filters you have deleted with the red X to a folder containing deleted filters. You can move deleted filters back to the filter folder at any time.

11. The Navigator



The navigator contains all viewing settings for the main window. The settings have no influence on the resulting image. Although navigation is done with the mouse, at times it can be useful to fit the image with the "fit" button below the small viewer or select the original resolution with the "1:1" button. Both features are also available via shortcuts. More information on the shortcuts is available via the "help"-button (item 12).

12. Information and Help

In the info window you can find more information on the version of Unlimited Filters and the license you use.



The help window contains a link to our Unlimited Filters tutorial videos as well as information on all shortcuts you can use to make your workflow more efficient.

13. What are 3D LUTs?

LUT stands for Lookup Table. A Lookup Table is a table outputting specific target values (the color value of a specific pixel in the filtered image) for all source values (the color value of a specific pixel in the original image). The entire table (LUT) contains corresponding target values for every possible color value (R, G, B). If we assume an RGB-image with 8 bit per color channel, every color channel contains 256 color values. That is to say, $256 \times 256 \times 256 = 16,777,216$ color values overall. We have packed this entire color table into our desktop filter. Since every color value in our desktop filter is exactly 1 pixel x 1 pixel the resulting filter has a size of 4096 x 4096 pixels ($=16,777,216$ color values). In order to be able to assign a source value to a target value it would ordinarily be necessary to double the amount of pixels. Since Unlimited Filters already knows the source values it is sufficient to just save the altered values to the filter in order to obtain the change of any possible color value.

Apart from the advantage of being able to save all color corrections (tonal value corrections, selective color corrections, gradation curves, tinting etc.)

in one single file (LUT), the second great advantage is the speed in which corrections can be applied. Video applications running in real time are no longer an issue. The speed in which edits can be applied is achieved by making complicated calculations for various color corrections obsolete since the software only has to look up color values in a table; and by the fact that modern graphics cards support 3D-LUTs.

Comparing 1D LUTs to 3D LUTs

The 3D in 3D LUT stands for the three axis or dimensions of the color channels R, G and B. Three independent 1D-LUTs for the R, G and B channels will only allow changes that are independent from the other two respective channels. I.e. this would mean that a red color value x would always be changed into another red color value y - disregarding the values for green and blue. In an 8-bit per channel image, three separate 1D LUTs only add up to $256 + 256 + 256 = 768$ values. The 3D LUT we use in Unlimited Filters is very different. A 3D LUT can be imagined as a three dimensional cube. The X-axis represents the red value, the Y-axis represents the green value and the Z-axis represents the blue value. The three dimensions make it possible to assign a target value to every color value in relation to the two other colors. This in turn means that our 3D LUT has $256 \times 256 \times 256 = 16,777,216$ values. In terms of processing speed this is not an issue when it come to picture editing. But 3d LUTs are also very popular in video editing where a solution with a higher performance has established itself: the $256 \times 256 \times 256$ cube is coarsed and the values between the remaining grid points are interpolated. The amount of grid points used for this purpose is not fixed. In practice, 3D LUTs in the size of $17 \times 17 \times 17 (=4913)$ color values

have proven most useful.

We have used this size as orientation for our mobile filter. Not only did it show advantages in the processing speed of smaller 3D LUT files but coarsening by means of our filter file has also proven quite beneficial (see item 2). In addition, the 256^3 LUT and the 17^3 LUT do not display any significant differences in quality. If any differences are visible they can't necessarily be judged as superior or inferior.

For that reason we recommend using our mobile filter instead of our desktop filter for most applications.

More information and video-tutorials at:

www.picture-instruments.com

Picture
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