

# **Photomatix Pro 3.0 User Manual**

## Introduction

Photomatix Pro processes multiple photographs of a high contrast scene into a single image with details in both highlights and shadows.

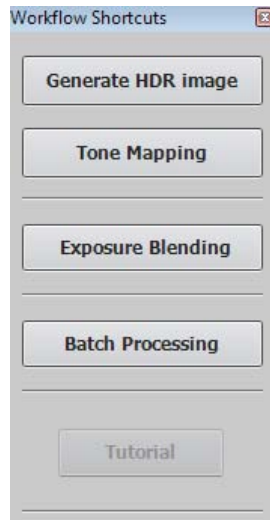
This manual offers step-by-step instructions for using the main features of the Photomatix Pro software. The first section offers tips for taking photographs intended for High Dynamic Range (HDR) processing. The second section describes how to create HDR images and process them through tone mapping. The third section deals with the Exposure Blending functions, and the fourth section with the Batch Processing tool. Finally, section five provides some advanced tips and techniques for working with images in Photomatix Pro.

The following icons are used throughout the manual:

- ☆ Useful information and important notes.
- ↖ Tips and recommendations.

## Workflow Shortcuts Panel

The functions of Photomatix Pro can be accessed via the menus. To allow faster access, some core functions can be launched via the “**Workflow Shortcuts**” panel shown here:



*Workflow Shortcuts Panel*

## Drag & Drop

You can drag files from Windows Explorer or other image browsers and drop them to the Photomatix Pro program when this is opened. If you drag & drop multiple image files, you will be able to access the HDR creation or Exposure Blending processes.

## Table of Contents

Section 1: Tips for taking photographs intended for HDR processing .....	1
1.1 Automatic Exposure Bracketing (AEB) .....	1
1.2 Manual Exposure Bracketing for DSLR cameras.....	3
1.2.1 Manual Exposure Bracketing with Compact Digital Cameras .....	4
1.3 Film photo techniques for creating HDR source images .....	4
Section 2: HDR Generation and Tone Mapping.....	5
2.1 HDR Generation.....	5
General settings for Generate HDR.....	8
Generate HDR settings when the source images are JPEG, TIFF or PSD files:.....	8
Generate HDR settings when the source images are RAW files:.....	9
2.2 Tone Mapping .....	11
2.2.1 Tone Mapping with Details Enhancer .....	11
2.2.2 Tone Mapping with Tone Compressor .....	17
Additional Tone Mapping Settings .....	19
Section 3: Exposure Blending .....	22
3.1 Blending Exposures .....	23
3.1.1 Highlights & Shadows – Adjust.....	24
3.1.2 Highlights & Shadows – Auto .....	24
3.1.3 Highlights & Shadows – 2 Images .....	25
3.1.4 Highlights & Shadows – Intensive.....	25
3.1.5 Average.....	25
Section 4: Automate.....	28
4.1 Batch Processing .....	29
4.1.1 Batch Processing Settings.....	29
Section 5: Advanced Tips and Techniques.....	37
5.1 Chromatic Aberrations (CA) .....	37
5.2 Image Alignment .....	39
5.3 Processing RAW files in 3 <sup>rd</sup> party raw converters .....	40
5.4 Blurred Images.....	41
5.5 ISO and Noise.....	41
5.6 Photomatix Pro and Color Management.....	41
Resources.....	42

## Section 1: Tips for taking photographs intended for HDR processing

Photographing a high contrast scene requires taking several exposures in order to capture information in both the brightest highlights and deepest shadows of the scene.

Photographs can be made with digital or film-based cameras. The only requirement is that the exposure can be adjusted when taking pictures. If you use a film-based camera, you will need to scan them into your computer before processing them. Photomatix Pro can merge image files saved in JPEG, 8-bit or 16-bit TIFF, and PSD formats. It also supports RAW files of several camera models.

There are two general recommendations for creating differently exposed source images:

- 1) Make sure to take a sufficient number of exposures to properly cover the dynamic range of the scene, from the darkest shadows to the brightest highlights.
- 2) Use a tripod whenever possible. Photomatix Pro incorporates Image Alignment functions, but using a tripod is still recommended.

### 1.1 Automatic Exposure Bracketing (AEB)

- Shoot with available light whenever possible. The flash may try to balance the exposure of all the images, when a range of exposures is the goal.
- Select a low ISO to minimize image noise.
- Select **Continuous shooting** mode on the camera's drive setting (Note: Continuous shooting mode may not always be the best strategy because camera shake may build up. We recommend using a method that ensures the least possible shake for each single shot, e.g. mirror lock-up functionality, if available). Consult your camera manual for model-specific instructions on using this setting.
- If possible, use the camera's self-timer setting, or a cable release to minimize camera shake.
- Set your camera to **Aperture priority** (A setting) so that only the shutter speed varies between the exposures.
- Set the camera to Auto Exposure Bracketing (**AEB**), which takes several photographs of a scene in a row: one at the proper exposure, one or more underexposed, and one or more overexposed.
  - Most cameras allow you to select the amount of over/under exposure in one-third or one-half increments. The suggested exposure increment is +/- 2 for optimal exposure range. If your camera does not offer +/- 2 exposure increments, select the maximum possible. Consult the camera manual for model-specific instructions on choosing this setting.



*AEB Settings on top LCD of a Nikon D80 (3 shots with +/- 2EV)*



*Canon Rebel XT/400D LCD showing AEB with +/-2 increments selected.*

- Select an appropriate number of auto-bracketed frames if your camera offers different options for the number of frames. For instance, if your camera can auto-bracket at a maximum of +/- 1 EV increments, then select 5 or more frames if your camera allows it. Five frames spaced by +/- 1 EV increments will give you the same dynamic range coverage as three frames spaced by +/- 2 EV increments.
- After capturing the bracketed images, check the histogram previews in playback mode to ensure that you have captured an adequate range of exposures.

It is important to remember that the number of exposures needed depends on the dynamic range of the scene, in addition to the exposure increment. For most outdoor scenes, three exposures taken at +/- 2 exposure increment will be sufficient, provided the scene does not include the sun. However, for the interior of a room with a bright view out of the window, you will need at least five images taken with an exposure increment of +/- 2, or nine images taken with an exposure increment of +/- 1.

## 1.2 Manual Exposure Bracketing for DSLR cameras

In scenes with extreme differences between light and dark detail, manual exposure bracketing over a greater exposure value range may provide better source images than Auto Exposure Bracketing. It is the only option if your camera does not offer automatic bracketing over a wide enough range to cover your scene. The following suggestions will help you to take optimal pictures using manual exposure bracketing.

- Choose a low ISO to minimize noise.
- Keep a constant aperture and ISO. Control image exposure by changing the shutter speed in full-stop increments. When taking pictures, use either the A or M setting, Either of which will allow you to fix the aperture.
- Shoot a series of images starting with your brightest image elements (highlights) being slightly underexposed (see Figure 2.1 below) to the darkest image elements (shadows) being slightly overexposed (see Figure 2.2 below). You may or may not want or need to use every exposure in the series for HDR processing, but it is easier to delete a picture at processing time than to return to a location to take additional images. Experiment with different combinations of the bracketed source images in Photomatix Pro to achieve your desired effect.
- Check your DSLR's Histogram preview in playback mode to ensure that you have captured the entire tonal range of the image. You should have at least one picture without a large peak at the left side of the histogram and one picture without a large peak at the right side of the image.
- Use self-timer mode and mirror lock-up, or a cable release and mirror lock-up options, if available. These will help minimize any camera shake, especially for exposures slower than 1/15 second.



**Figure 2.1** Histogram depicts the brightest elements (highlights) underexposed.



**Figure 2.2** Histogram depicts the darkest image elements (shadows) overexposed.

### 1.2.1 Manual Exposure Bracketing with Compact Digital Cameras

Consult your camera's user manual to determine if manual exposure is possible. If this is possible, you can follow the steps for Manual Exposure Bracketing with a DSLR.

☛ If your compact camera does not have an AEB setting, or allow you to set the exposure manually, you can use the exposure compensation setting to manually bracket. The series below shows the same scene captured at -2, 0 and +2.



*LCD display*

### 1.3 Film photo techniques for creating HDR source images

- Follow the advice for shooting with a digital camera. Keep in mind that you will not have the option of previewing the live histogram to determine your exposure range.
- Scan your film or slides, not prints. Photo labs will attempt to make the best print from each of your source images, and you will not achieve good results scanning these for HDR generation.
- Turn off your scanner's auto-exposure options. This allows you to manually control the exposure.
- Make sure you select the *Align images* option in Photomatix Pro when combining your images.



## Section 2: HDR Generation and Tone Mapping

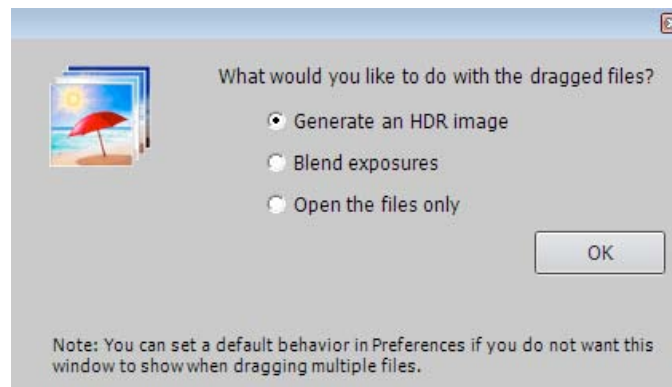
Creating images that display the High Dynamic Range captured by photographs taken under different exposure settings is a two-step process:

- The first step is to merge your differently exposed photographs into a single 32-bit HDR image. Because of its high dynamic range, an HDR image will not display properly on conventional monitors.
- In the second step, the HDR image is then processed, or 'developed,' via the Tone Mapping tool. Tone Mapping will 'reveal' the dynamic range captured in the HDR image and produce an image which can be properly displayed on conventional monitors. This can then be properly printed.

☆ The order of files in a bracketing sequence does not matter. Photomatix Pro will systematically sort the image files based on exposure information retrieved from the EXIF data. It will use their relative brightness levels when the exposure information is not available.

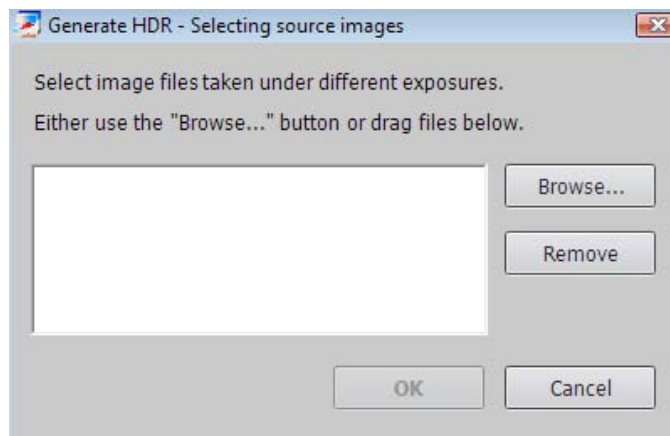
### 2.1 HDR Generation

The easiest way to start the generation of the HDR image is by dragging your bracketed images to the open Photomatix Pro application. Then select the option *Generate HDR image*

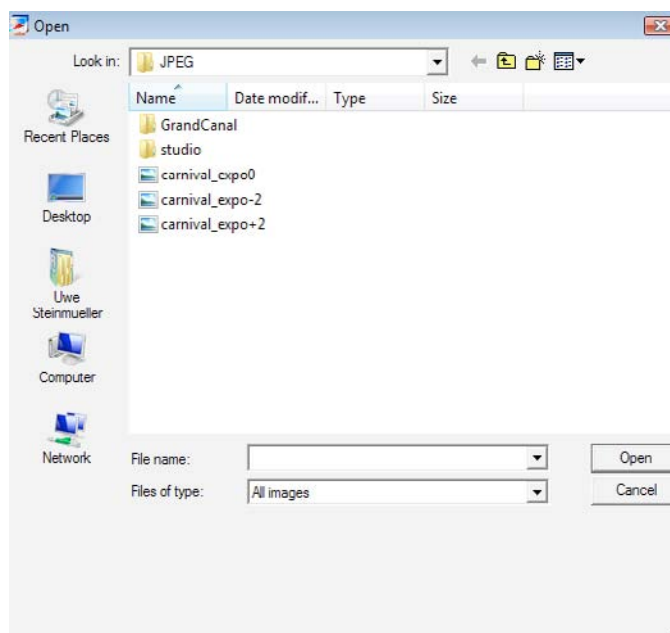


As an alternative, you can also click on the *Generate HDR Image* button of the Workflow Shortcuts, or go to the *Process* menu and select the *Generate HDR* item.

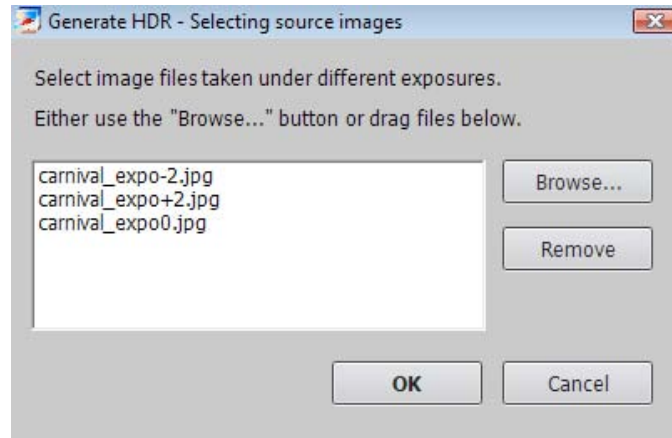
The *Generate HDR – Selecting source images* window will display.



Click *Browse*. An Open Panel will display to allow you to select the source images to be combined.



Highlight the images that you wish to use for HDR Generation. Then click on the *Select* button. The selected image files will be listed on the *Generate HDR – Selecting source images* window.

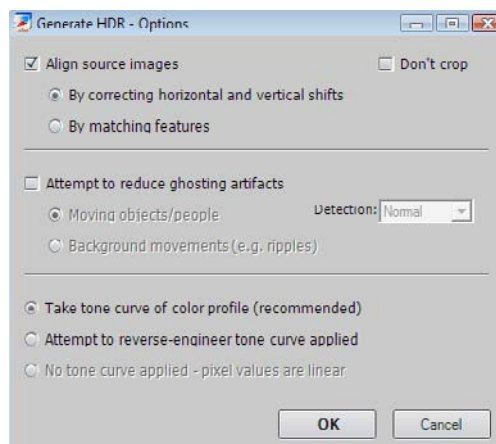


☆ Photomatix Pro can generate an HDR image from 8-bit, 16-bit and RAW source files. Supported file types include JPEG, TIFF, PSD, DNG and RAW files from many camera models. As the list of supported camera models often changes when a new sub-version of Photomatix Pro is released, we suggest that you consult the Photomatix Pro FAQ on the [www.hdrsoft.com](http://www.hdrsoft.com) website to check whether your camera model is supported. If your camera model is recent, you may have to upgrade to a new version, or wait till Photomatix Pro adds support for it.

Click **OK** to proceed further.

☆ If the exposure information cannot be found in the metadata of the image files, Photomatix will show a window where you can input the relative Exposure Values for each one of your images. This window will also show if two or more source images share the same exposure information.

The *Generate HDR - Options* window will appear.



This window will display when the source images are JPEG, TIFF or PSD files. When they are RAW files, a different window will be displayed (read more below).

## General settings for Generate HDR

### Alignment settings

The *Align source images* option is checked by default. The *Align images* option corrects for misalignment problems if the camera moved slightly between the bracketed frames. This is the case with hand-held photographs, but may also happen when shooting with the aid of a tripod.

Photomatix offers two alignment methods based on different algorithms. The first one *By correcting horizontal and vertical shifts* is fast but corrects for translation movements only. The second one *By matching features* corrects for both rotation and translation.

The *Don't crop* option is useful when the resulting images must have the same width and height as the source images. As an example, Realviz Stitcher requires this of images it processes.

### Ghosting reduction settings

If the scene has moving objects and you find the resulting 'ghosts' are not desirable, then check *Attempt to reduce ghosting artifacts* with the option *Moving objects/people* selected. If there are elements in the scene that follow a rhythmic pattern (flowing water for instance) oscillating between shadows and highlights, then select the option *Background movements* instead. In both cases, first try leaving the *Detection* option set to *Normal*. If you find that the resulting HDR image still shows too much ghosting, then try again with the option set to *High*.

Only check the *Attempt to reduce ghosting artifacts* box with the *Moving objects/people* option if it is necessary. Checking them in other cases will lower the quality of the resulting HDR image.

## Generate HDR settings when the source images are JPEG, TIFF or PSD files:

The recommended option *Take tone curve of color profile* is selected by default. This is usually the best choice when the images files come from a DSLR camera or have been converted from RAW files. This option loads the Tone Reproduction Curve data from the ICC color profile associated with the source images in order to determine the non-linear function applied to the raw sensors data. If no profile is available, it uses the tone reproduction curve of the Adobe RGB color profile.

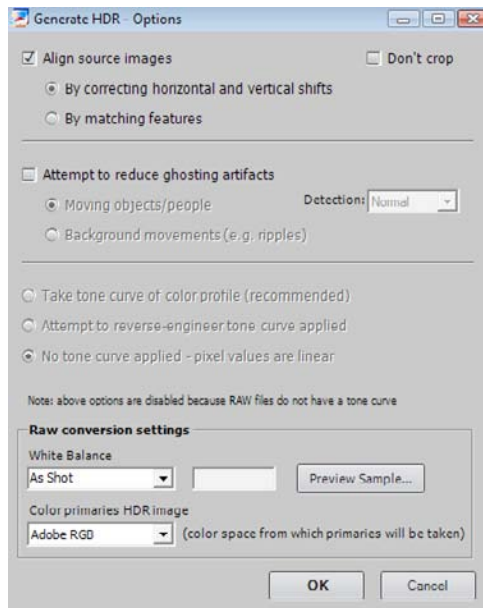
When the images are scanned films or taken with a compact camera, it may be worthwhile to check the option *Attempt to reverse-engineer tone curve applied*.

If your source images are 16-bit TIFF files that have been converted from RAW files with a special option in the RAW converter to leave the image in linear space, then check the option *No tone curve applied – pixel values are linear*. Only check this option if you are 100% sure that

the tonal values of the images are linear relative to the values of light captured. Please note that the terminology linear may be used with a different meaning depending on the RAW converter (in Adobe Camera RAW, for instance, linear is relative to the Adobe RGB color space and not to the values of light).

### Generate HDR settings when the source images are RAW files:

The *Generate HDR - Options* window will display with additional options:



By default, Photomatix will use the *As Shot* White Balance (read from the EXIF metadata) when converting the RAW data to HDR. You can adjust the White Balance by selecting a pre-defined white balance from the drop-down menu, or by specifying the color temperature in Kelvin. A preview lets you see the effect of the change on the source image.

The RAW data is in a color space specific to the camera. Photomatix will convert the data into a standardized color space (by default Adobe RGB). You can, however, select sRGB or ProPhoto RGB instead.

It is important to note that the selected color space is used for the color primaries only, and not for the tone reproduction curve. Since the HDR image values are in linear space, they do not have a tone curve. The tone curve of the profile associated with the image will only be applied during the tone mapping step, and not to the HDR image itself.

Once you are satisfied with the settings of the *Generate HDR - Options* window, click OK to create the 32-bit HDR image.

A progress bar will display in the *Generate HDR - Options* window. Once the HDR is generated, the HDR image and the HDR Viewer window will display on-screen.



- Step one of the two-step process is now complete.
- Until Tone Mapping is applied, the 32-bit image seen on screen cannot display its full tonal range.
- The small view on top of the “HDR viewer” window shows a local section of the HDR image viewed at the appropriate exposure.

➤ Saving the 32-bit HDR image at this point will allow you to apply different Tone Mapping settings to the HDR source image without repeatedly following the *Generate HDR* procedure. Since version 3.0, Photomatix Pro saves the name of the color profile in the header of HDR images saved in the Radiance (.hdr) format. This means you will not have to re-assign the color profile, provided the HDR image file have been saved as Radiance and the color profile is either sRGB, Adobe RGB or ProPhoto RGB. However, the color profile information of the source images will not be preserved if the HDR image has been saved in the OpenEXR format.

☆ Photomatix Pro allows you to create a 32-bit HDR image from a single RAW file. To do this, open one RAW file using *File->Open*, and Photomatix will convert it into a pseudo-HDR image. It is important to note that an image created with a single RAW file cannot really be considered High Dynamic Range. The important characteristic of this pseudo-HDR image is that it is unprocessed. Its dynamic range is not much larger than the range of an already converted file.



## 2.2 Tone Mapping

The generated HDR image cannot be represented properly on screen without further processing. An unprocessed HDR image is somewhat similar to a film negative or the RAW file of a digital camera. It needs further processing for display or printing. In Photomatix Pro, this processing is called Tone Mapping.

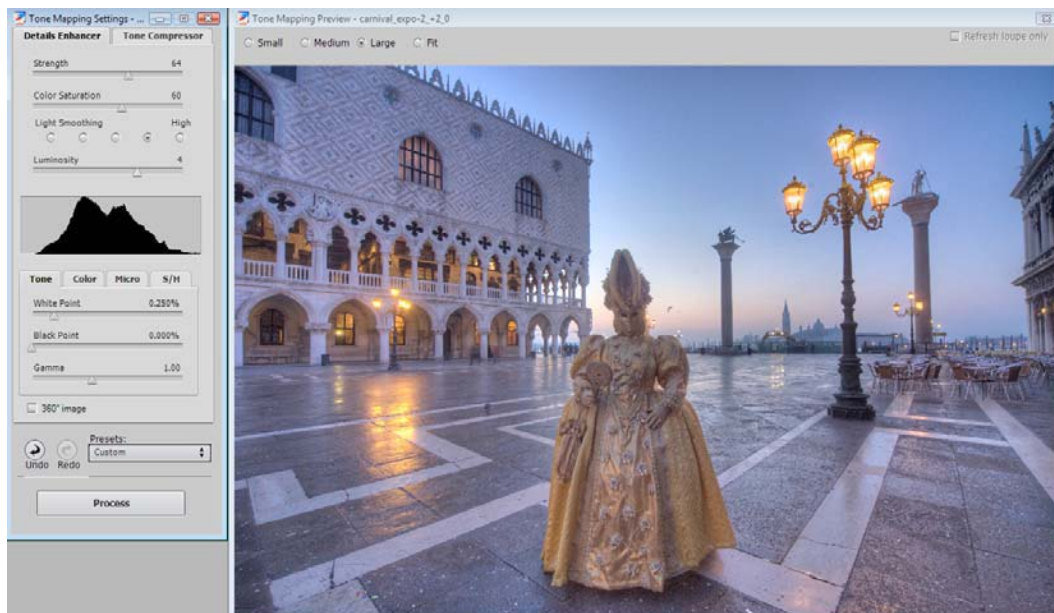
There are two tone mapping methods for processing the HDR image: ***Details Enhancer*** and ***Tone Compressor***.

### 2.2.1 Tone Mapping with Details Enhancer

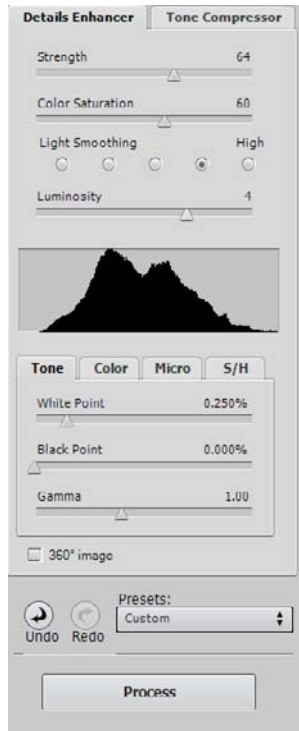
Photomatix Pro defaults to this option when the *Tone Mapping* window is opened. Details Enhancer utilizes a local operator to ‘develop’ the HDR image. This means that it takes into account the local brightness context -- a pixel of a given value in the HDR image will be mapped differently depending on whether it is located in a bright or dark area of the image.

Click on the *Tone Mapping* button on either the *HDR Viewer* window, the *Workflow Shortcuts* window or the *Process>Tone Mapping* menu to launch the Tone Mapping tool for the active open HDR image. If you have used the *Generate HDR* process to create a new HDR source image, it will be the active image. Otherwise, open a saved HDR image file via the *File>Open* menu.

Use the slider controls to adjust the image. The preview on the right provides an approximation of what the image will look like once Details Enhancer is applied to the entire HDR source image. In the case of the Details Enhancer tone mapping method, the preview is not always an accurate representation of the final tone mapped image.



Details Enhancer incorporates the following image adjustment sliders:



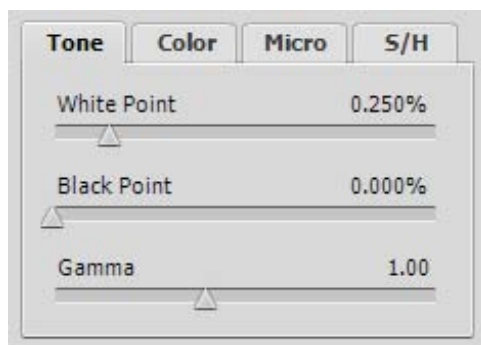
### General adjustments

**Strength:** Controls the strength of contrast enhancements. A value of 100 gives the maximum increase in both local and global contrast enhancements.

**Color Saturation:** Controls the saturation of the RGB color channels. The greater the saturation, the more intense the color. A value of zero produces a grayscale image. The value affects each color channel equally.

**Light Smoothing:** Controls smoothing of contrast variations throughout the image. A higher value tends to reduce halos and give a more natural look to the resulting image. A lower value tends to increase sharpness.

**Luminosity:** Controls the compression of the tonal range, which has the effect of adjusting the global luminosity level. Moving the slider to the right has the effect of boosting shadow details and brightening the image. Moving it to the left gives a more natural look to the resulting image.

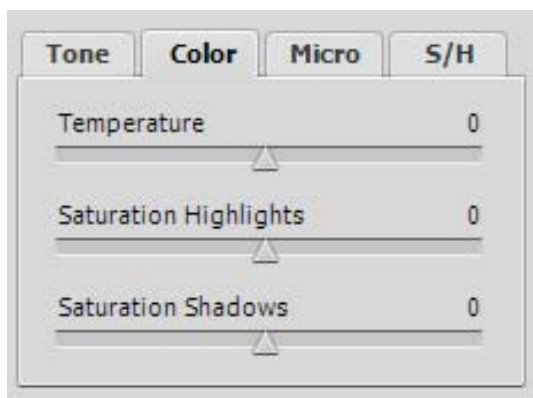


### Tone adjustments

**White Point - Black Point:** Both sliders control how the minimum and maximum values of the tone mapped image are set. Moving the sliders to the right increases global contrast. Moving them to the left reduces clipping at the extremes. The White Point slider sets the value for the maximum of the tone mapped image (pure white or level 255). The Black Point slider sets the value for the minimum of the tone mapped image (pure black or level 0).

**Gamma:** adjusts the mid-tone of the tone mapped image, brightening or darkening the image globally.





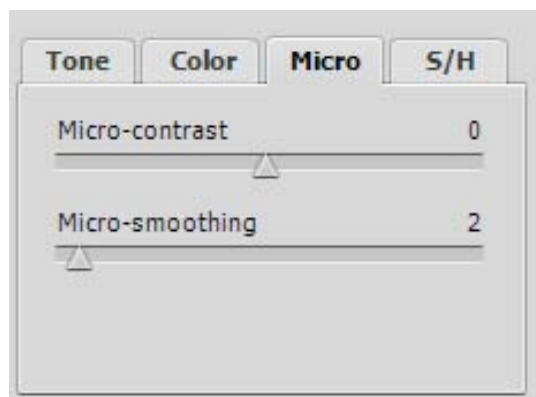
### Color adjustments

**Color Temperature:** Adjusts the color temperature of the tone mapped image relative to the temperature of the HDR source image. Moving the slider to the right will give a “warmer”, more yellow-orange colored look. Moving the slider to the left gives a “colder” more bluish look. A value of zero will preserve the original color temperature of the HDR source image.

**Saturation Highlights:** Adjusts the color saturation of the highlights relative to the color saturation set with the *Color Saturation* slider. Values higher than

zero increase the color saturation in the highlights; values lower than zero decrease it.

**Saturation Shadows:** Adjusts the color saturation of the shadows relative to the color saturation set with the *Color Saturation* slider. Values higher than zero will increase the color saturation in the shadows. Values lower than zero will decrease it.

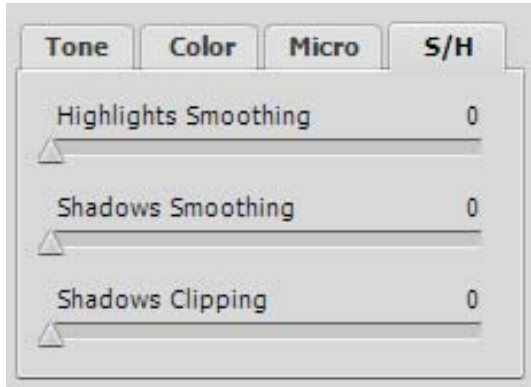


### Micro adjustments

**Micro contrast:** Sets the level of accentuation of local details.

**Micro-smoothing:** Smooths out local detail enhancements. This has the effect of reducing noise in the sky for instance, and tends to give a “cleaner” look to the resulting image.

☆ **Important note:** The Loupe may not properly show the effect of the Micro-smoothing setting when the area magnified is uniform. If you want to see the effect of the micro-smoothing setting at 100% resolution on a uniform area such as the sky, you will have to select an area that contains an object in the scene in addition to the sky.



### Shadows/Highlights adjustments

**Highlights Smoothing:** Reduces the contrast enhancements in the highlights. The value of the slider sets how much of the highlights range is affected. This control is useful to prevent white highlights from turning grey, or uniform light blue skies becoming dark blue-grey. It is also useful reducing halos around objects placed against bright backgrounds.

**Shadows Smoothing:** Reduces the contrast enhancements in the shadows. The value of the slider sets how much of the shadows range is

affected.

**Shadows Clipping:** The value of the slider sets how much of the shadows range is clipped. This control is useful to cut out noise in the dark area of a photo taken under low-light situation.

### Other setting

**360° image:** This option needs to be checked when the image processed is an equi-rectangular image intended to be viewed as a 360° panorama. This is because Details Enhancer takes into account local contrast and will assign different tonal values to the 360° seams of the panorama. This will produce a visible seam once the resulting image is rendered in a panorama viewer. Checking this option corrects for this.

- The 360° image option should only be checked for equi-rectangular 360° images. Checking it in other cases may produce less optimal results.
- Checking the 360° image option increases the amount of memory necessary to process the image by more than 50%. Processing times will also be increased.

Once you are satisfied with the results of the Details Enhancer adjustments Click *Process* to create the tone mapped image.

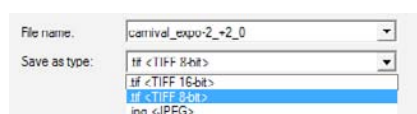


☆ *Process>Undo Tone Mapping* will undo the tone mapping settings applied to the original HDR image. The tone-mapped image will revert to a 32-bit HDR image, which can then be tone mapped again.

The resulting tone mapped image always has a bit depth of 16 bits/channel. This is even the case if the source images were JPEGs or 8-bit TIFF files.

### Saving the tone mapped image

Save the resulting file using the *File>Save As* menu. .



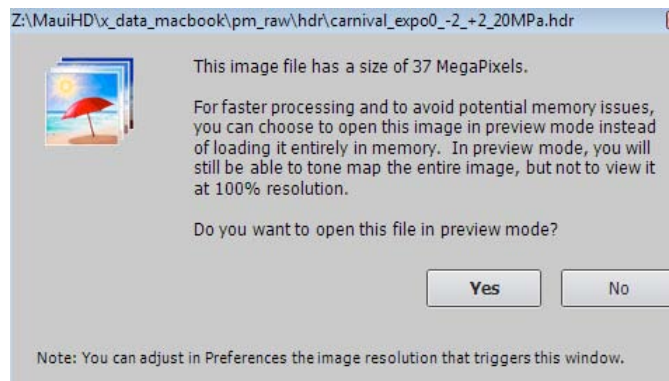
**TIFF – 16bit:** Best choice for further processing

**TIFF – 8bit:** For use in applications that cannot deal with 16 bit

**JPEG:** For use on the web without further editing

*File>Save settings* will save the applied tone mapping settings as an **.xmp** file so you can easily reproduce the same Tone Mapping process in the future.

☆ If you open a large HDR file (larger than the threshold set in preferences, by default 30 Megapixels) the following window will show:



If you click yes the HDR file will be opened in preview. You will get the same tone mapping window and the preview as shown above. The only difference is that you cannot view the file at 100% in the Loupe. The same dialog shows for both Tone Mapping methods.

The *Tone Mapping* window offers additional settings, which are explained after 'Tone Mapping with Tone Compressor' instructions.

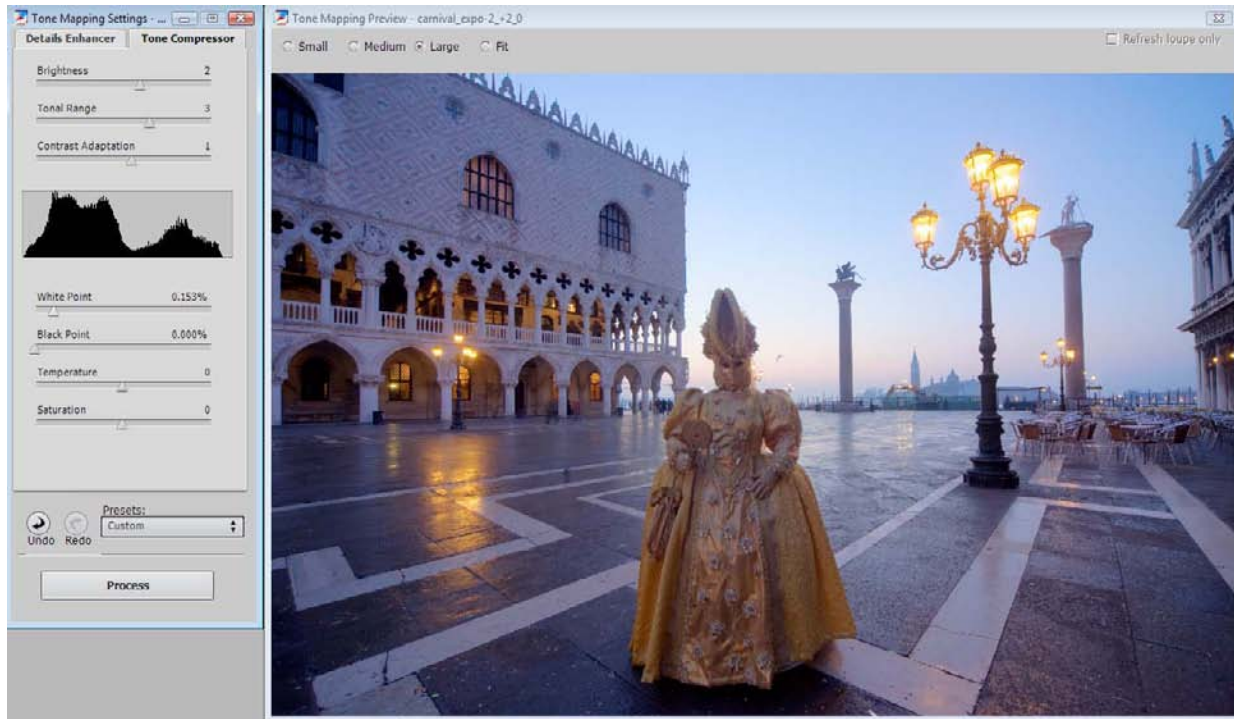


*In the example above, the HDR image was generated from these three source images.*

## 2.2.2 Tone Mapping with Tone Compressor

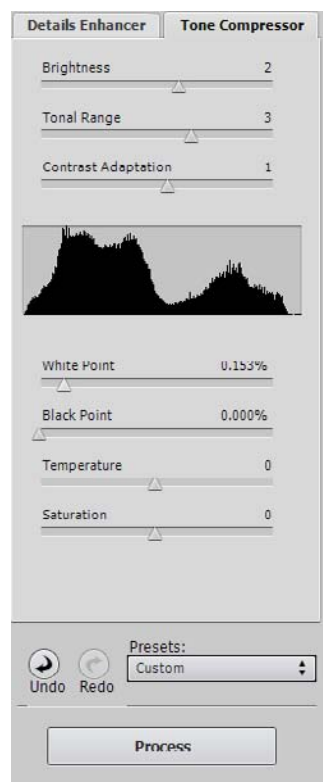
From the *Tone Mapping* window, select the *Tone Compressor* tab.

Use the slider controls to adjust the image. The preview on the right provides a view of what the image will look like once Tone Compressor is applied to the entire HDR source image.





Tone Compressor incorporates the following image adjustment sliders:



**Brightness:** Influences the tone mapping process done on the HDR image in regards to overall image brightness.

**Tonal Range Compression:** Controls how the tonal range of the 32-bit image is compressed into the 0-256 range of 8-bit monitors. The higher the value, the more both shadows and highlights will be shifted toward the center of the histogram. The Tone Compressor tone mapping method ignores local context.

**Contrast Adaptation:** Sets how much the contrast is adapted to the intensity of the pixel values processed.

**White Point - Black Point:** Both sliders control how the minimum and maximum values of the tone mapped image are set. Moving the sliders to the right increases global contrast. Moving them to the left reduces clipping at the extremes. The White Clip slider sets the value for the maximum (pure white or level 255). The Black Clip slider sets the value for the minimum (pure black or level 0).

**Color Temperature:** Adjusts the color temperature of the tone mapped image relative to the temperature of the HDR source image. Moving the slider to the right gives a “warmer”, more yellow-orange colored look. Moving the slider to the left gives a “colder” more bluish look. A value of zero preserves the original color temperature of the HDR source image.

**Color Saturation:** Adjusts the color saturation of the tone mapped image. The greater the saturation, the more intense the color. The value affects each color channel equally.

Once you are satisfied with the results of the Tone Compressor adjustments click *Process* to create the tone mapped image.



☆ *Process>Undo Tone Mapping* will undo the tone mapping settings applied to the original HDR image. The tone mapped image will revert to a 32-bit HDR image which can then be tone mapped again.

### Saving the tone mapped image

Save the resultant file using the *File>Save As* menu (you have the same options as shown in the previous section on Details Enhancer).

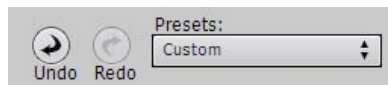
*File>Save settings* will save the applied tone mapping settings as an **.xmp** file so you can easily reproduce the same Tone Mapping process in the future.

## Additional Tone Mapping Settings

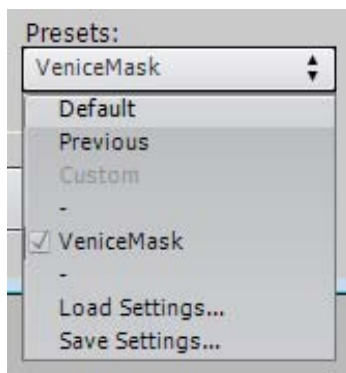
In addition to the image adjustment controls, the Tone Mapping Settings and Preview windows include several other options and settings, which apply to both the Details Enhancer and Tone Compressor methods.

**Preview:** Photomatix Pro offers four preview sizes: small, medium, large and fit. Select the radio button for desired size.

↩ Click the mouse on the preview to zoom in to 100% magnification. Click the mouse again to return to full image preview.



**Reset, Undo & Redo:** Reset lets you change the values to the Photomatix default values. *Undo* (arrow to the left) and *Redo* (arrow to the right) allow for quick switching between the current and previous settings done in the Tone Mapping window.



### Tone Mapping Presets

Photomatix allows you to store settings for use at a later time.

**Default:** Default settings.

**Previous:** Recalls settings used the last time you used the tone mapping tool.

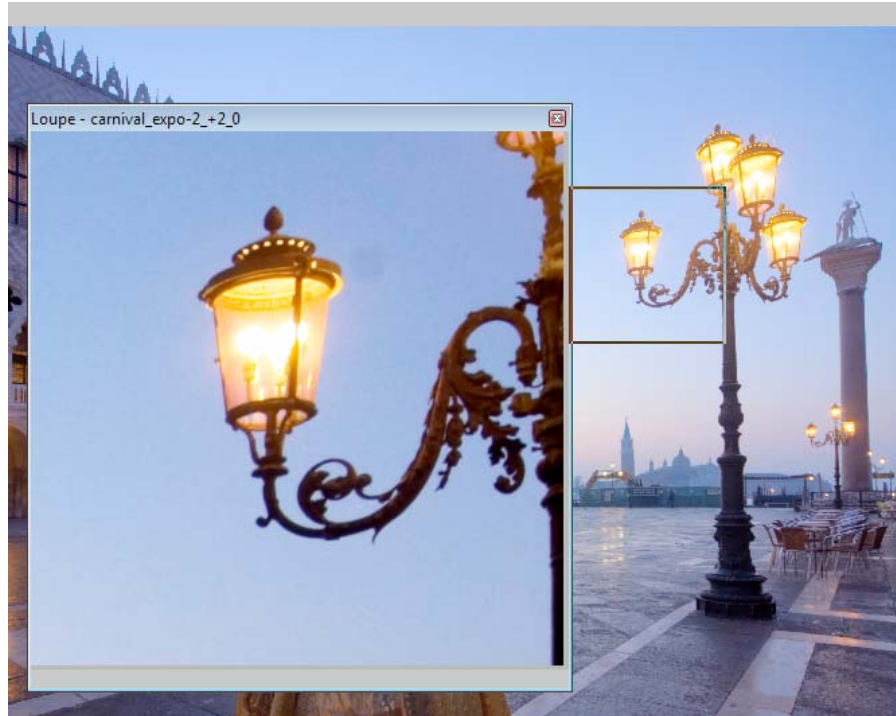
**List of saved presets:** e.g. here “VeniceMask”, which had been saved during a previous session using “Save Settings”

**Load Settings...:** Load settings previously saved via “Save Settings” as XMP file outside of the Presets folder.

**Save Settings...:** Save settings either in the Presets folder or elsewhere. When they are saved in the Presets folder, they will show in the list of Preset for quick access.

**Delete Settings...:** Delete presets that are not needed anymore.

## Inspecting the preview with the Loupe tool



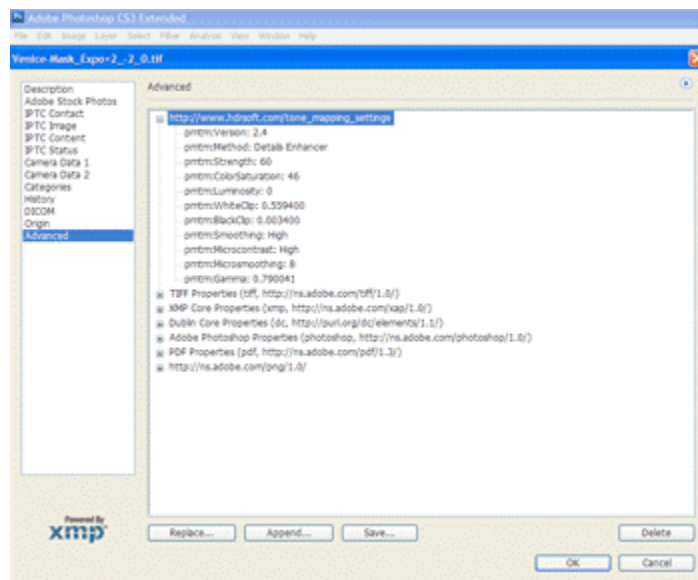
Loupe shows 100% pixel view

Both Tone Mapping methods feature a Loupe panel so that you can inspect fine details in your image. If you move the mouse over the preview you see a square marquee. If you click at some position the content of that square will show up in the Loupe panel.

☆ The option *Refresh loupe only* can be used to avoid refreshing the main preview when you change settings. This will speed up the view refresh inside the loupe window.



☛ If you save the tone mapped image as a TIFF file, the tone mapping settings will be automatically embedded as XMP metadata in the TIFF file. If you open the file in Photoshop, you can then view the tone mapping settings under *File->Info->Advanced*.



## Section 3: Exposure Blending

In addition to the two-step HDR processing described in the previous pages, Photomatix Pro also offers several single-step exposure blending methods. These will combine differently exposed images to show detail in both shadows and highlights.

- These blending methods combine differently exposed photographs into a single image. It uses the existing shadow and highlight detail from the source images to make a single final 'blended' image with an expanded tonal range.

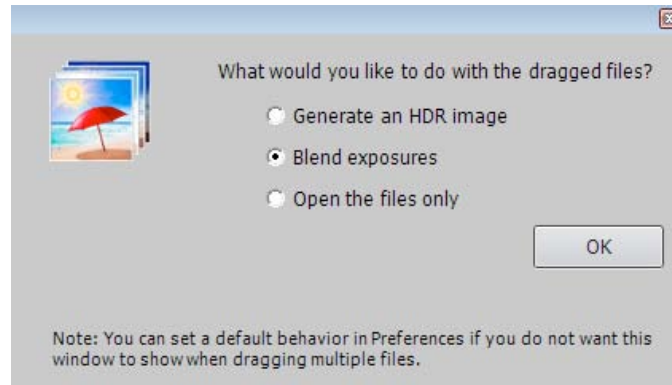
Exposure Blending offers several advantages over the HDR and Tone Mapping workflow described in the previous section:

- Blending the images has the effect of reducing noise whereas HDR and tone mapping amplify it.
- The blended image does not differ much from the source images, giving it a more natural look.
- Exposure Blending is a simple and easy to understand process, with no or few parameter settings.

Exposure Blending may not always work well when the dynamic range of the scene is high. This can result in a lack of local contrast and a "flat" look. The memory required for blending exposures increases with the number of source images and bit-depth.

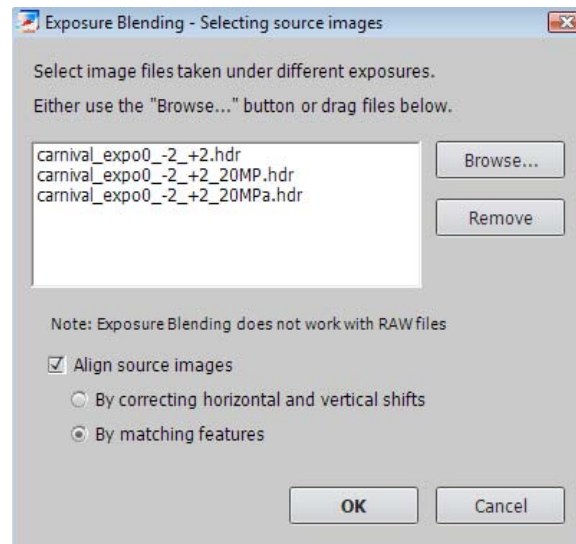
### 3.1 Blending Exposures

To start Exposure Blending, drag your images to the open Photomatix Pro application, and select the option *Blend exposures*



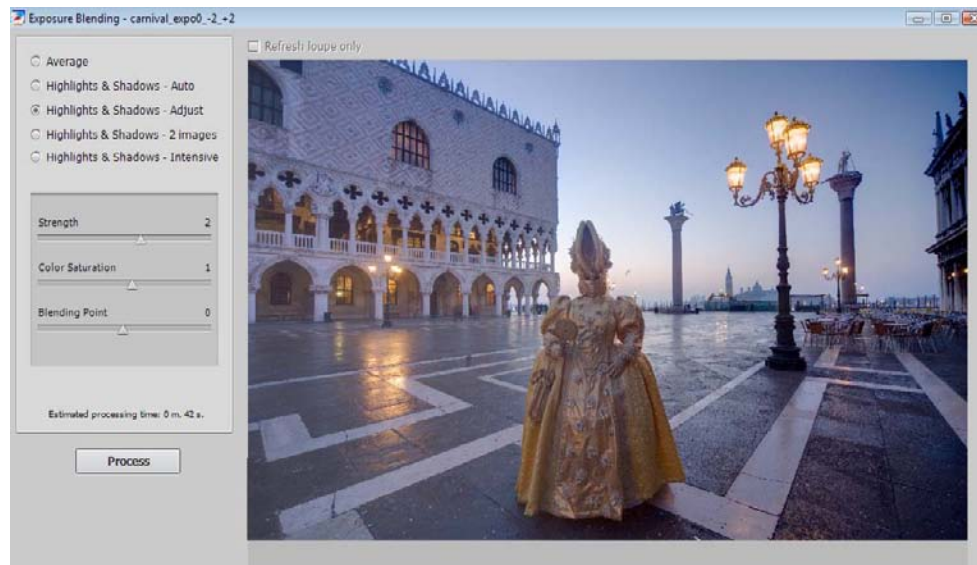
Alternatively, you can also click on the *Exposure Blending* button of the *Workflow Shortcuts*, or go to the *Process* menu and select the *Exposure Blending* item.

The *Exposure Blending – Select source images* window will display. Load your images via the *Browse* button (not needed if you use drag & drop).



The *Align Source images* option corrects for misalignment problems if the camera moved slightly between the bracketed frames. This is the case with hand-held photographs and may happen when shooting with the aid of a tripod.

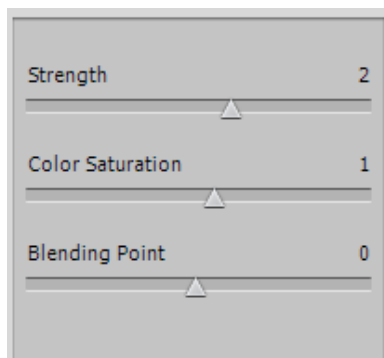
Click on *OK* and the *Exposure Blending* dialog will show.



Select the Exposure Blending method of your choice. Some methods allow settings and some are fully automatic. Try different methods to get the most pleasing results. The default method *Highlights & Shadows – Adjust* is often a good choice.

### 3.1.1 Highlights & Shadows – Adjust

#### Adjust the settings sliders



**Strength:** Controls the strength of local contrast enhancements.

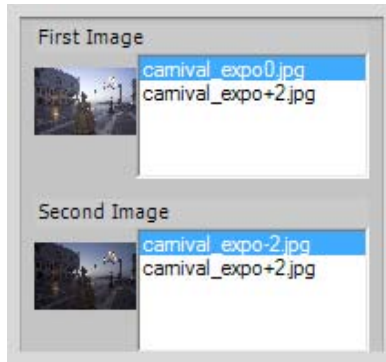
**Color Saturation:** Allows the increase or decrease of image saturation.

**Blending Point:** Controls the weighting given to the source images. When moving this slider to the right, the over-exposed images are favored. This has the effect of brightening the image. The reverse applies when moving the slider to the left.

### 3.1.2 Highlights & Shadows – Auto

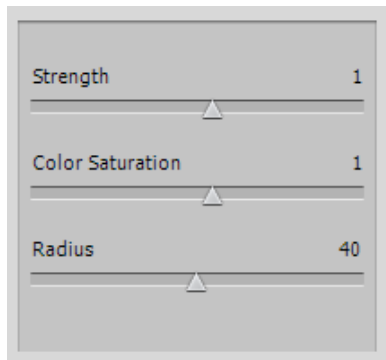
This blending method is automatic. If you like the result, you are done. Otherwise, try one of the manual options.

### 3.1.3 Highlights & Shadows – 2 Images



This method blends only two images. The displayed dialog allows you to select which images get blended.

### 3.1.4 Highlights & Shadows – Intensive



**Strength:** Controls the strength of local contrast enhancements.

**Color Saturation:** Allows the increase or decrease of image saturation.

**Radius:** Controls the area used to calculate the weighting of the source images. A higher radius reduces halos, but increases processing times significantly.

### 3.1.5 Average

The *Average* method combines the images using the same average formula everywhere, regardless of whether the processed pixels is in a dark or bright area. This is why averaging can not produce the dynamic range extension you can get with one of the Highlights & Shadows blending methods. The Average method offers better noise reduction (it is equivalent to the process called Image Stacking).

Click *Process*. Photomatix Pro will create an Exposure Blended image.



Highlight & Shadows – Adjust: Resulting blended image

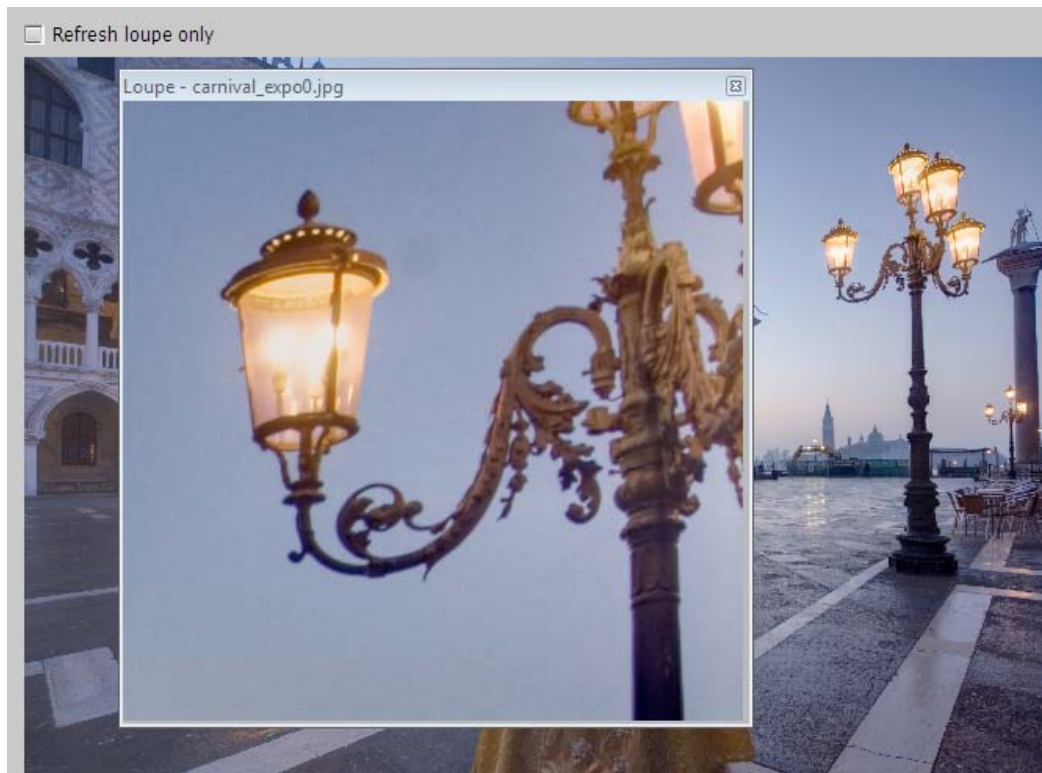
Save the processed file using the *File>Save As* menu.



Available file formats

The TIFF 16-bit option is only available if the source images were also 16 bits/channel. Exposure Blending does not change the channel bit-depth. The resulting image will have the same channel bit-depth as the source images.

## Inspecting the preview with the Loupe tool



Loupe shows 100% pixel view

Exposure Blending features a Loupe panel so that you can inspect fine details in your image. Moving the mouse over the preview displays a square marquee. If you click at some position, the content of that square will show up in the Loupe panel.

☆ The option *Refresh loupe only* can be used to avoid refreshing the main preview when you change settings. This speeds up the refreshing of the view inside the loupe window.

## Section 4: Automate

Photomatix supports two different batch process functions:

- **Batch Processing:** Processes multiple photos taken at different exposures
- **Single File Conversion:** Processes single image files

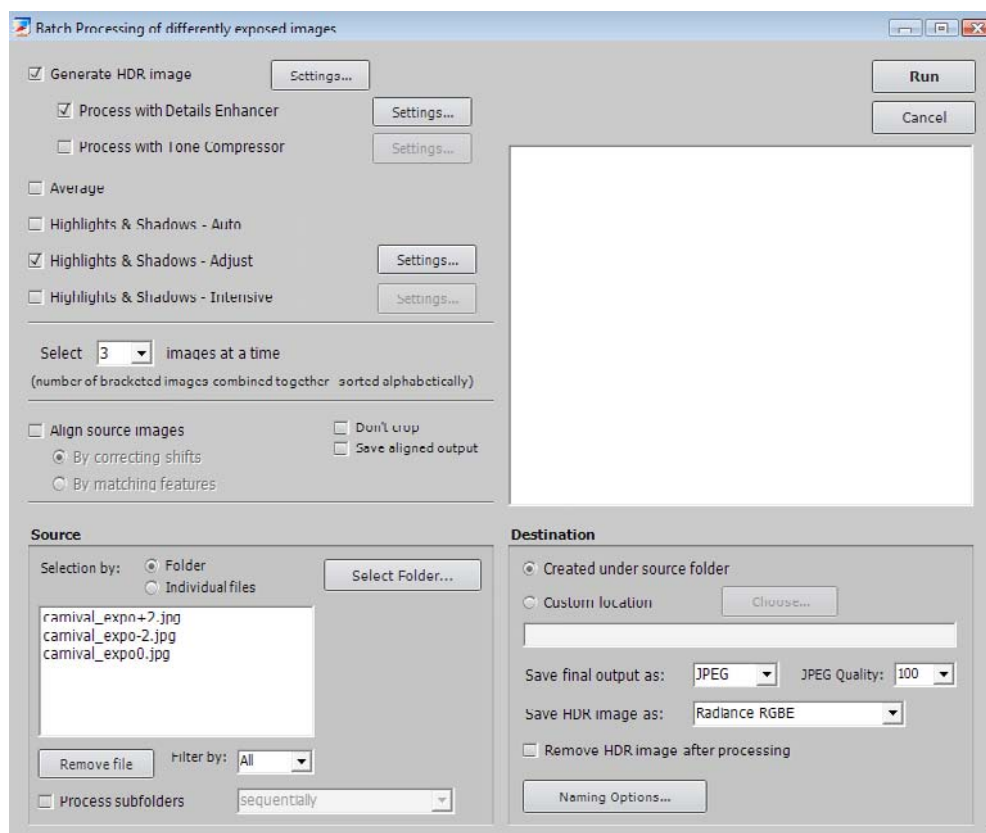
Batch Processing may be used to:

- Process an exposure series to create HDR image files ready to be tone mapped individually. If you open another session of Photomatix Pro, you can start working on the first images while Batch Processing is still processing the remaining exposure series.
- Apply several different tone mapping or exposure blending methods to one set of source images.
- Apply the same tone mapping or exposure blending settings to several different sets of source images.
- Apply both of the above processes at once: applying many different tone mapping or exposure blending methods to several sets of source images.



## 4.1 Batch Processing

Click on the *Automate* menu and select *Batch Processing* or use the *Batch Processing* button on the *Workflow Shortcuts* panel.



☆ The batch can process sub-folders with different numbers of source images in each folder.

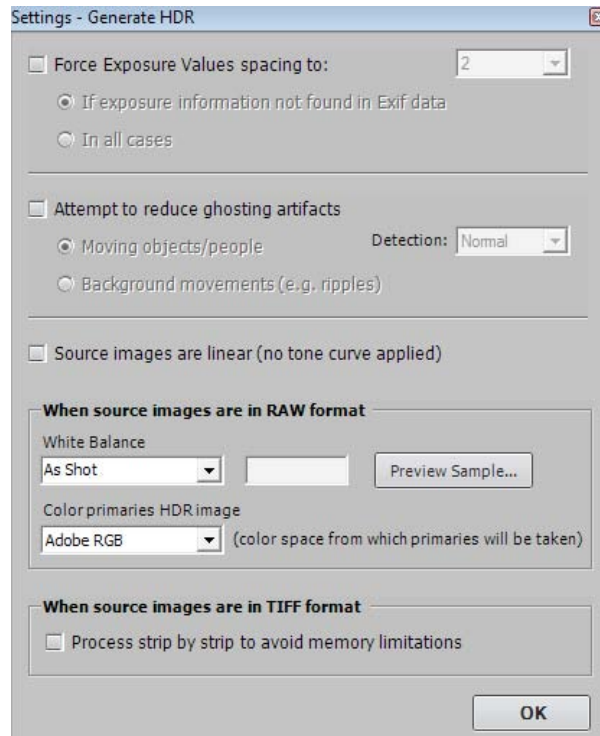
⚠ It is important to note that when you are processing different sets of source images in a single folder, each set must contain the same number of source images. If each set contains a different number of source images, you will need to place them into separate folders and select the *All* option for the number of files to process.

### 4.1.1 Batch Processing Settings

Select the processes to be automated. At least one option described below (Options A-G) must be selected to run the Batch Processing.

#### Option A: Generate HDR image

Check this option if you want to create a 32-bit *HDR image*. Click the *Settings* button to open an option window.



The first checkbox will force the EV spacing to the specified value. This option can be used when the exposure information is not available in the EXIF data (or if two or more images have the same exposure information), or to force the EV spacing in all cases. In the latter case, the exposure information in the EXIF data will be ignored.

If there are moving objects in the source images and you find the resulting 'ghosts' are not desirable, check *Attempt to reduce ghosting artifacts* with the option *Moving objects/people selected*. If there are elements in the scene that follow a rhythmic pattern (flowing water for instance) oscillating between shadows and highlights, then select the option *Background movement*.

Only check the *Attempt to reduce ghosting artifacts* option if it is needed.

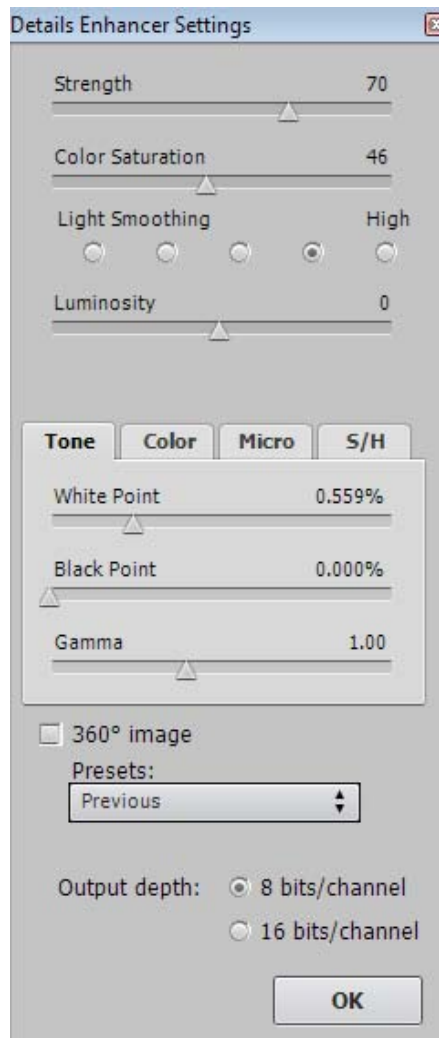
If the source images are large TIFF files, check the option *Process strip by strip*. With this option, the HDR image file will be created in several passes, processing and loading only one strip of each image into memory at a time. One strip is composed of a limited number of rows set to not exceed around 512 MB of RAM. This option is particularly useful when processing large panoramas.

If the source images are RAW files, *White Balance* and *Color Primaries* may be selected. Please refer to the HDR Generation chapter of section 2 for details on those settings.

### Option B: Process with Details Enhancer

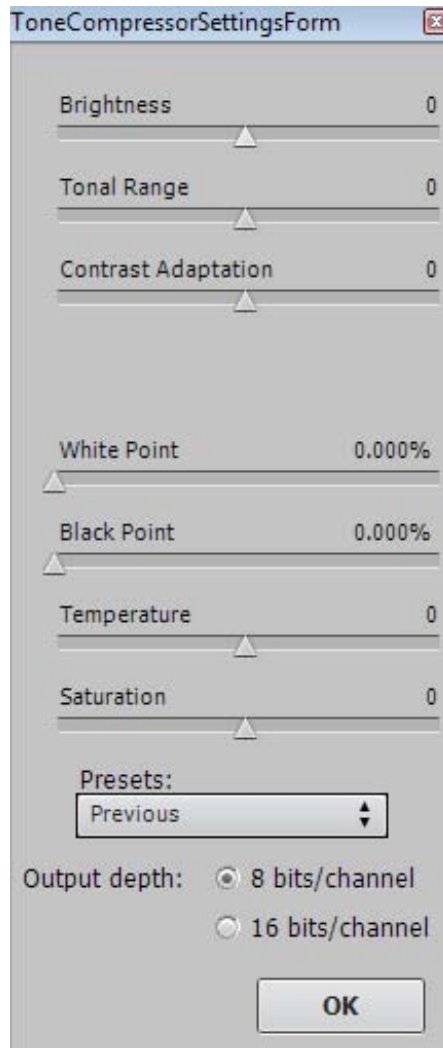
Check this option if you want to automatically tone map the HDR image with the *Details Enhancer* method. Click the *Settings* button to open a window which allows the adjustment of the Details Enhancer settings (described in Section 2). You may load settings, which were saved in an XMP file in this window.

When the option *Save* is checked, the settings will be saved in an XMP file alongside the tone mapped images. This option is checked by default.



**Option C: Process with Tone Compressor**

Check this option if you want to automatically tone-map the HDR image with the *Tone Compressor* method. Click the Settings button to open a window that allows the adjustment of the Tone Compressor settings (described in Section 2). You may load settings that were saved in an XMP file in this window.



☛ Batch Processing lets you tone map your HDR images with Details Enhancer and Tone Compressor simultaneously.

### Option D: Average

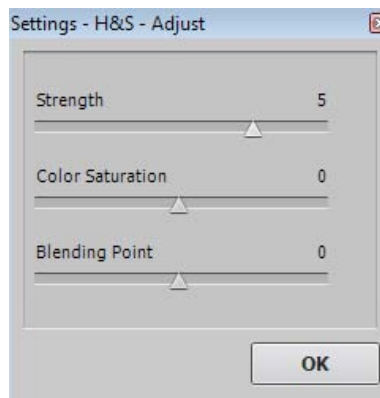
Check this option if you want to combine the source images using the average method. There are no other options available.

### Option E: Highlights & Shadows – Auto

Check this option if you want to combine the source images with the exposure blending method *Highlights & Shadows – Auto*. There are no other options available.

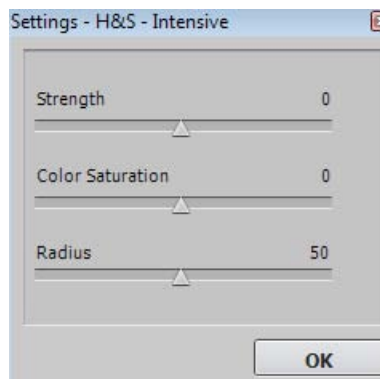
### Option F: Highlights & Shadows – Adjust

Check this option if you want to combine the source images with the exposure blending method *Highlights & Shadows – Adjust*. Click the *Settings* button to open a window to adjust the Strength, Color Saturation and Blending Point.



### Option G: Highlights & Shadows – Intensive

Check this option if you want to combine the source images with the exposure blending method *Highlights & Shadows – Intensive*.



### Number of Source Images to process

Select the number of source images to process at a time: 2-11 or All.

*All* should only be selected if you are using the *Process Subfolders* option, or if the folder processed contains only one set of bracketed exposures. When *All* is selected, Photomatix will attempt to process all images in each folder, so it is important that only one set of source images be in each subfolder.

☆ It is possible to Batch Process multiple series of source images with varying numbers of source images, if each series is in its own subfolder, and *All* is selected.

☆ If all source images from multiple series are in a single folder, each series must have the same number of source images. Images are processed alphabetically.

### Image Alignment Options

Check *Align Images*, if correction for slight camera movements between source photographs is needed.

When *Align images* is checked, the images will be cropped after alignment in order to remove invalid areas on the edge due to the correction for misalignment shifts. If you want to skip the cropping, then check the *Don't crop* option. This option may be useful if you are processing images intended to be stitched together to create a panorama.

### Select a source location

Photomatix allows multiple ways to select source images.

- **By Folder:** Click on the *Select Source Folder* button and select a folder with images to process. All images in that folder will show up in the file list.
- **By individual files:** In this single files can be added to the file list.

In the case when *Folder* is selected, the *Process subfolders* option may be checked. This option offers two sub-options.

- **Sequentially:** Processes the image files in one sub-folder, then moves on to the next sub-folder, all of which are contained in the main, parent folder.
- **Grouped by Exposures:** In this case the sub-folders are organized by exposures. As an example, if you have taken a series of three bracketed images, one sub-folder contains all underexposed images, the next all normal exposed images and the third one all overexposed images. Inside a sub-folder, the images that belong to one image group (to be merged) need to be at the same relative alphabetical position inside the sub-folder.

⚡ Use *Process Subfolders* if you have multiple series of source images which vary in the number of source images they contain. The Batch Processing can process series with varying numbers of source images if each series is in its own subfolder and *All* is selected.

Select a file type from the *Filter by File Type* dropdown. Options are: All, TIFF, JPEG, PSD and RAW.

☞ This option is useful if a source folder contains RAW+JPEG from a camera, and you are processing only one file type.

### Select a **Destination** location

By default, *Same as source* is selected. With this option, the Batch Processing will save the resulting images in a subfolder within the source folder. The resulting folder will be prefixed by 'PhotomatixResult'. Checking *Select* allows you to select a specific (different) location on your computer.

Select a file type for saving (JPEG or TIFF). If applicable, select an HDR file type for saving the HDR image file (Radiance RGBE or OpenEXR). If you want to save only the Tone Mapping results and not the 32-bit HDR image, check *Remove generated HDR image after processing*.

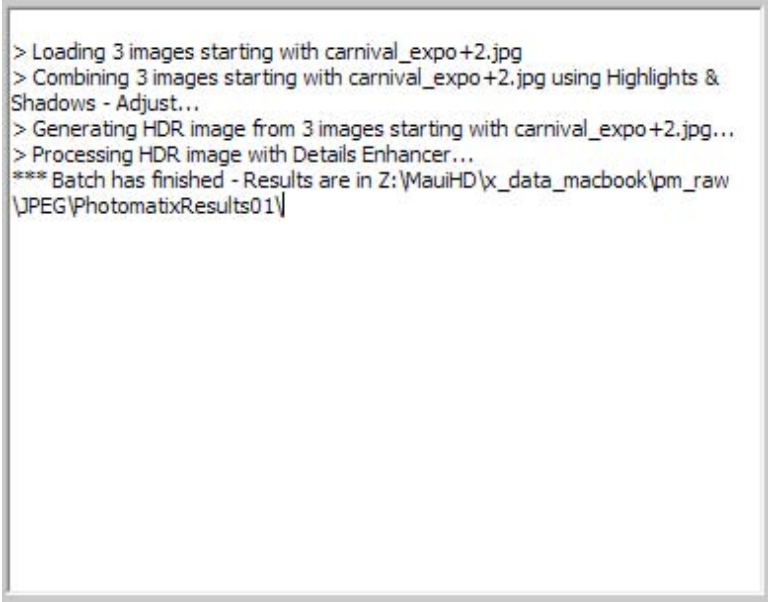
Click *Naming Options* to choose a naming strategy.

☆ *Start with Set Number* or *Start with Filename of first image in the set* are the main options. *Start with Set number* will yield long names such as: Set01Enhancer3from\_IMG\_3421.jpg. Checking *Use shortened version* will yield shorter names that do not reference the source files: Set01Enhancer.jpg, for example. *Start with Filename of first image in the set* yields file names that start with the first image in the set: IMG\_3431\_2\_3Enhancer.jpg, for example. *Suffix* (optional) will append additional file name information to the end of the assigned file names.

### **Start Batch Processing**

Click *Run* to start batch processing.

The window below the *Run* button will show the status of each process in real time.



```
> Loading 3 images starting with carnival_expo+2.jpg
> Combining 3 images starting with carnival_expo+2.jpg using Highlights &
Shadows - Adjust...
> Generating HDR image from 3 images starting with carnival_expo+2.jpg...
> Processing HDR image with Details Enhancer...
**** Batch has finished - Results are in Z:\MauiHD\X_data_macbook\pm_raw
\JPEG\PhotomatixResults01\
```



## Section 5: Advanced Tips and Techniques

### 5.1 Chromatic Aberrations (CA)

Often you may see on your tone mapped or merged image artifacts like these:



CA shown in Photomatix Pro after merging

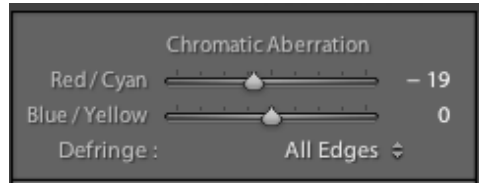
This is the result of chromatic aberrations (sometimes called fringing).

What are chromatic aberrations? Most lenses are not perfect and can sometimes focus the red, green and blue channels on different planes (relative to the sensor). This can produce green/purple fringes at higher contrast edges. The effect is stronger towards the corners than in the center. Even top rated zoom and wide-angle prime lenses can show this artifact.

A tone mapped or blended image can show stronger chromatic aberrations than in the source images. Careful inspection of the source images can reveal them.

Fortunately, some RAW converters like Adobe Camera Raw and Lightroom can help to fix chromatic aberrations. Below, the correction of chromatic aberrations using Lightroom is shown. The Lightroom Develop module has an extra function for removing chromatic aberrations.

- Correct chromatic aberrations in all RAW files inside Lightroom



CA correction in Lightroom

Setting *Defringe* to *All Edges* can improve the correction.

- Copy (Synch) the chromatic aberrations settings to all RAW files that you will merge in Photomatix Pro.
- Export all files as 16-bit TIFF files from Lightroom.
- Merge the images in Photomatix Pro with your method of choice (HDR + tone mapping or exposure blending).

Here is the result in Photomatix using this workflow:



Fixed result

## 5.2 Image Alignment

It is believed that using a tripod can avoid any mis-alignment of the photos. This is often not the case because of:

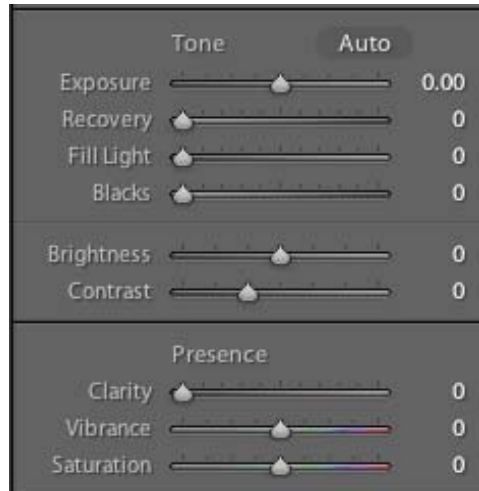
- Wind
- Shutter slap (even using mirror lockup)
- Shaky ground

This can be checked using a 200mm telephoto lens. It is surprising how much the exposures can be out of alignment. The good news is that the Photomatix Pro alignment functions can often properly align them. Photomatix supports two different alignment methods, based on different algorithms. If one doesn't work, the other should be tried.

## 5.3 Processing RAW files in 3<sup>rd</sup> party raw converters

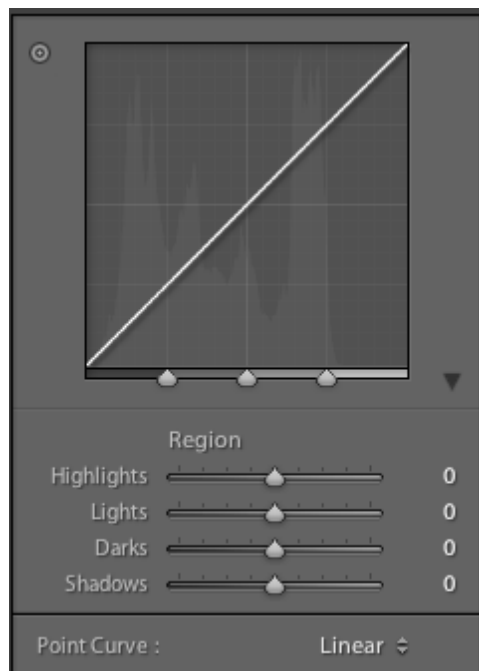
If a RAW converter is used (e.g. Adobe Lightroom or Camera Raw), images should be processed with the following settings:

- **WB (White Balance):** Same WB for all involved photos.
- **Basic settings:** Should be all set to zero.



Sample Settings

- **Curves:** Both Parametric and Point Curves should be linear.



## 5.4 Blurred Images

If bracketed images are merged and the resulting image is blurred, the reason can be one of the following:

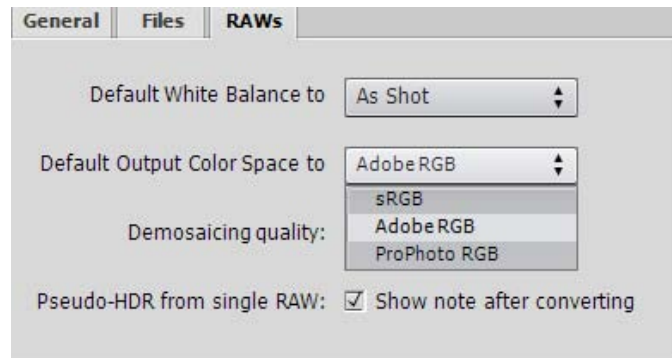
- Images are too far out of alignment and the image alignment functions cannot handle it.
- One or more images show motion blur due to too long shutter speed (even using image stabilized lenses or a tripod). In this case, it is recommended that the individual images are checked for motion blur.

## 5.5 ISO and Noise

As the ISO value of your image increases, so does the noise in the shadows. Exposure Blending can help reduce noise, but it is still a good practice to photograph at the lowest ISO level possible.

## 5.6 Photomatix Pro and Color Management

Photomatix Pro supports color management even if RAW files are processed. It is recommended that the same working space be used in Photomatix Pro as you use in other image editors (e.g. Photoshop).



Photomatix supports the three most popular working spaces:

- **sRGB**: Used if your images are only created for the web.
- **Adobe RGB**: Popular working space for printing if extreme saturated colors are not used.
- **ProPhoto RGB**: Extreme wide gamut working space. This should never be used for 8-bit images.

For all JPEG and TIFF files Photomatix Pro preserves the color spaces of the source files.

## Resources

For more information, we recommend the Photomatix Pro FAQ on the HDRsoft website at [http://www.hdrsoft.com/support/faq\\_photomatix.html](http://www.hdrsoft.com/support/faq_photomatix.html).