Photomatix Pro 3.2 User Manual

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Introduction

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

Photomatix offers two types of processes to increase the dynamic range. One process is called *HDR Tone Mapping*, the other *Exposure Fusion*. Both processes are designed to produce an image with an increased apparent dynamic range, but their results are different. You should try both and then choose the result that works best with your images.

The first section of this manual provides tips for taking photographs intended for High Dynamic Range (HDR) processing in Photomatix Pro. The second section describes how to create HDR images and process them through Tone Mapping. The third section deals with the Exposure Fusion functions, and the fourth section with the Batch Processing tool. Finally, section five provides a few tips and techniques.

The following icons are used throughout the manual:

☆   Useful information and important notes.

↖   Tips and recommendations.

Drag-and-drop

You can directly access the HDR creation or Exposure Fusion processes by dragging and dropping to Photomatix Pro a group of image files of the same scene taken under different exposures. On Windows, you can drag the files from Windows Explorer and drop them on the opened Photomatix Pro program. On Macintosh, you can drag the files from the Finder and drop them on the Photomatix Pro icon on your Dock. You can also drag images from other image browsers.

Note that you need to drag the image files belonging to the same exposure sequence together in order to have them taken into account for the HDR creation and Exposure Fusion processes.

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.

Section 1: Taking photos for HDR

The shooting phase is essential for getting good results with Photomatix. To photograph a high contrast scene, you need to take several exposures in order to capture information in both the highlights and the shadows of the scene. The exposures taken will have to properly cover the dynamic range of the scene, especially the shadows.

The number of photos you need depends on the scene. It also depends on the Exposure Value (EV) spacing separating the photos. If you take them in one-EV steps (e.g., -1, 0, +1 EV), you will need more photos than if you take them in two-EV steps (e.g., -2, 0, +2 EV). We recommend shooting in two-EV steps whenever possible.

High contrast scenes can be grouped into roughly two types depending on their dynamic range:

- *Medium dynamic range scene*: Most landscapes and other types of outdoor scenes fall into this category. Three exposures taken in two-EV steps (i.e. –2, 0 +2 EV), or five exposures taken in one-EV steps, are usually sufficient for this type of scene.

- *High dynamic range scene*: A typical example is the interior of a room with a view outside the window on a sunny day. You need to take at least five exposures in two-EV steps (or nine exposures in one-EV steps) to capture this type of scene, but you may need more. Taking the exposures manually is recommended in these cases.

The source photographs for HDR processing can be taken 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 the photographs into your computer before processing them (see subsection 1.3 below).

1.1 Camera set up

- Set your camera to **Aperture priority** (A setting) so that only the shutter speed varies between the exposures.
- Select a low ISO (e.g., ISO 100 or lower).
- Turn the flash off. The flash may try to balance the exposure of all the images, when a range of exposures is the goal.
- Whenever possible, mount the camera on a tripod. Even though Photomatix Pro offers automatic alignment of hand-held photos, using a tripod is always better.

DSLR cameras and some compact digital cameras offer Automatic Exposure Bracketing (AEB). This enables you to automatically take three or more exposures in a row: one at the proper exposure, one or more underexposed, and one or more overexposed. Follow these steps if your camera offers AEB mode:

- Select the **Continuous shooting** mode on the camera's drive setting. Consult your camera manual for model-specific instructions for using this setting.
- Set the camera to Auto Exposure Bracketing (**AEB**)
- If possible, use the camera's self-timer setting, or a cable release to minimize camera shake.
- Set the exposure increment to +/- 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 for choosing this setting.

Note: The 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.

AEB settings at the top of the LCD of a Nikon D80 (3 shots with +/- 2EV)

Canon Rebel XTi/400D LCD showing AEB with +/-2 increments selected

1.2 Selecting the exposures

To get good results with HDR processing, your capture sequence must include photos that correctly expose highlights and photos that correctly expose shadows. The latter is especially important to avoid noise showing in the processed HDR image.

In the lightest photo of the sequence, the darkest shadows should be at least in the mid-tones. You can check that with your camera's histogram preview in playback mode. In your most overexposed photo, the left part of the histogram should be empty until 1/3rd of the histogram's width. If this is not the case, you will have to add one or more photos taken with longer exposure times. Another option is to re-shoot the exposure sequence with the normal exposure set one or more EVs higher if your most underexposed image in the exposure sequence was too dark. This is the case when the histogram of your darkest image is completely empty on the right half.

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 increments will be sufficient, provided the scene does not include the sun. However, for the interior of a room with a bright view out 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.

In scenes with extreme differences between light and dark details, you should change the exposures manually to ensure you capture a wide enough range to cover your scene.

1.3 Taking photos for HDR with film-based cameras

▪ Follow the camera setup listed at the top of subsection 1.1 and the tips on selecting exposures in subsection 1.2. Keep in mind that you will not have the option of previewing the live histogram to determine your exposure range.
▪ Scan 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: Creating an HDR image and processing it with Tone Mapping

There are two steps involved in creating and processing HDR images:

- Step 1 merges your photos taken under different exposure settings into a single 32-bit HDR image. Because of its high dynamic range, the 32-bit HDR image will not display properly on conventional monitors.
- Step 2 processes the 32-bit HDR image via the Tone Mapping tool. Tone Mapping will 'reveal' the dynamic range captured in the HDR image and produce an image that can be properly displayed on conventional monitors and is ready for printing.

2.1 Creating a 32-bit HDR image

The easiest way to load the bracketed photos you want to merge into an HDR image is by dragging them to the open Photomatix Pro application (Windows) or to the Photomatix icon in the Dock (Macintosh). Then, select the "Generate HDR image" option.

Alternatively, you can also click on the "Generate HDR Image" button of the Workflow Shortcuts, or choose *Process > Generate HDR*.

☚ If you have Lightroom, you should use the Lightroom Export Plug-in to Photomatix Pro for your RAW files. Please refer to section 5 of this manual.

If you have not dragged and dropped your images, click on the "Browse" button of the "Generate HDR – Selecting source images" dialog. An Open panel will be displayed to allow you to select your photos taken under different exposure settings. Highlight the image files that you want to merge into an HDR image. Then, click on the "Select" button, and click "OK" to proceed further.

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

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

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 for RAW files often changes when a new sub-version of Photomatix Pro is released, we suggest that you consult the Photomatix Pro FAQ on the HDRsoft website at http://www.hdrsoft.com/support/raw.html to check whether your camera model is supported. If your camera model is relatively new, you may have to upgrade to a new version, or wait until Photomatix Pro adds support for it.

2.1.1 Settings for Generate HDR
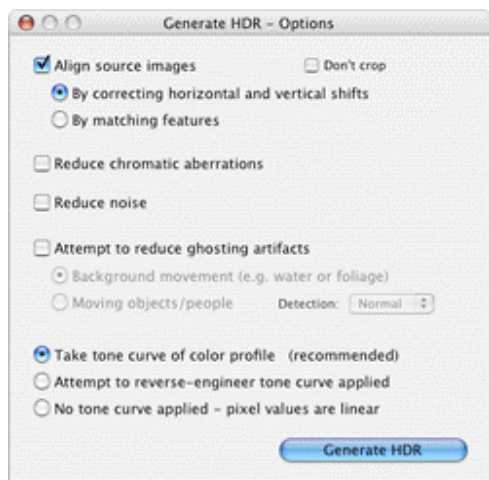
Alignment settings

The "Align source images" option is checked by default. This option corrects misalignment problems when the camera moves slightly between the bracketed frames. This always happens with hand-held photographs, but may even happen when shooting with the aid of a tripod.

Photomatix Pro offers two alignment methods. 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, and is recommended for hand-held shots. Given that each method is based on a different algorithm, try the other one when one fails.

The "Don't crop" option is useful when the resulting images must have the same width and height as the source images.

Chromatic aberrations reduction

This option attempts to automatically correct color fringing due to chromatic aberrations of the lens. Checking this option is recommended, given that chromatic aberrations tend to show around high contrast edges, and are thus particularly an issue for HDR images.

Noise reduction

This option reduces chromatic noise and, to a lesser extent, luminance noise. This option is recommended when you are processing RAW files directly in Photomatix. Note that the noise reduction is done on the HDR image itself once it has been created. This means that you don't have to check the noise reduction option on the dialog for generating the HDR image when you need noise reduction. You can apply noise reduction to your HDR image later on by choosing *Utilities > Reduce Noise*.

Ghosting reduction settings

Ghosting artifacts appear when combining images of a dynamic scene. Photomatix Pro offers options to reduce two types of ghosting artifacts. The option "Background movements" reduces ghosting artifacts caused by background elements that follow a rhythmic pattern (flowing water, for instance), oscillating between shadows and highlights. The "Moving objects/people" option attempts to reduce the 'ghosts' in the combined image due to moving persons, animals or objects.

It is important to note that selecting "Moving objects/people" lowers the quality of the resulting HDR image. Only select this option if it is really necessary, and try first with "Detection" set to "Normal".

Tone curve options

The recommended option, "Take tone curve of color profile", is selected by default. This is usually the best choice when the image 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

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applied to the raw sensor's 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 RAW converter that allow the image to be left in linear space (note: very few RAW converters allow this), 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 term "linear" may have 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, so you should never check this option with files converted with Photoshop or Lightroom.

RAW conversion settings

When your source images are RAW files, the dialog shows options to let you select a white balance and color primaries.
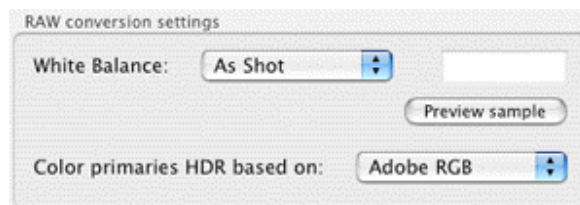
By default, Photomatix will use the "As Shot" White Balance (read from the EXIF metadata) when converting the RAW data to HDR. You can adjust the White Balance by selecting a pre-defined white balance from the drop-down menu, or by specifying the color temperature in Kelvin. A preview lets you see the 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. Please 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.

2.1.2 Comments on the generated HDR image

In the companion "HDR viewer" window, the small image area at the top displays a zoomed-in section of the properly exposed HDR image at the current pointer location.

The generated 32-bit HDR image is in an unprocessed state, which means that the large range of highlight and shadow details contained in the HDR image cannot be properly displayed on screen at this stage. An unprocessed HDR image is, in a way, similar to a film negative or the RAW file of a digital camera. The image needs further processing, called Tone Mapping, for display or printing.

☜   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. Photomatix Pro saves the name of the color profile in the header of an HDR image 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, though, 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 Processing the HDR image with Tone Mapping

Tone Mapping is necessary to reveal the details in shadows and highlights in your 32-bit HDR image created from multiple exposures. You can either use Tone Mapping immediately after having generated an HDR image or after opening an existing HDR image file that was previously saved. To access the Tone Mapping tool, click on the "Tone Mapping" button on either the HDR Viewer window or the Workflow Shortcuts window, or choose *Process >Tone Mapping.*

Photomatix Pro offers two tone mapping methods:

- The *Details Enhancer* method is based on a local operator, which means that it takes into account the local brightness context for tone mapping. Pixels are processed differently depending on whether they are located in a bright or dark area of the image. This method offers settings that let you process the image in creative ways.

- The *Tone Compressor* method is based on a global operator, which means that pixels are processed independently of their surroundings. This method produces more 'natural-looking' results.

When you start the Tone Mapping tool, you will get two windows:

1) The "Tone Mapping Settings" dialog provides sliders to adjust the tone mapped image to your liking. The dialog also lets you save presets or load existing ones. The tabs on top of the dialog let you switch between the two tone mapping methods. The "Process" button at the bottom of the dialog will process the entire HDR image so that you can then save it.

2) The "Tone Mapping Preview" window provides a preview of what the image will look like once the Tone Mapping has been applied to the entire HDR source image and includes options to adjust the size of the preview. Note that, in the case of the *Details Enhancer* method, the preview is not always an accurate representation of the final tone mapped image.

2.2.1 General controls

The image adjustment controls are specific to the tone mapping method activated and are described in the next subsection. The Tone Mapping Settings and Preview dialogs include additional general controls, which apply to both tone mapping methods.

Preview size

The radio button across the top of the Preview dialog let you choose between two or three sizes for the preview, related to the size of the original. For instance, "1/4" means that the size of the preview is one fourth the size of the original HDR image. The "Preview Magnification" control allows you to scale the selected size upwards by the given percentage (up to 175% when you use click on the arrows, and up to 199% when you type the value in).

Show Original / Show Preview

"Show Original" lets you quickly toggle back and forth between a preview of the tone mapped image (the default) and the original, non-tone mapped image ("Show Original"). Use this to compare the effects of your changes with the original.

Floating Histogram

The tone mapping Histogram is a floating window that contains four selectable tabs to improve your analysis of the image: Luminance, Red, Green, and Blue. In addition, if you move your mouse back and forth across the histogram, Level, Count, and Percentile information are provided. If the histogram is turned off, enable it by selecting "8-bit Histogram..." from the "View" menu.

Loupe

When you move the mouse over the preview, you will see a square marquee. If you click on some position, the content of that square will show up at 100% resolution in the "Loupe" panel. You can use the option "Refresh Loupe only" to avoid refreshing the main preview when you change settings. This will speed up the view refresh inside the Loupe window.
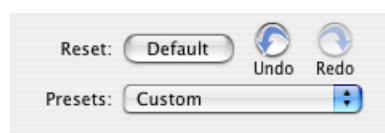

Reset, Undo & Redo

At the bottom of the Tone Mapping Settings dialog, the "Undo" (arrow to the left) and "Redo" (arrow to the right) buttons let you undo and redo changes you made to the settings.

Presets

The "Presets" menu lets you quickly access default or previous settings, as well as specific settings you had defined earlier. It also allows you to save the current settings and load settings available outside the Presets location.
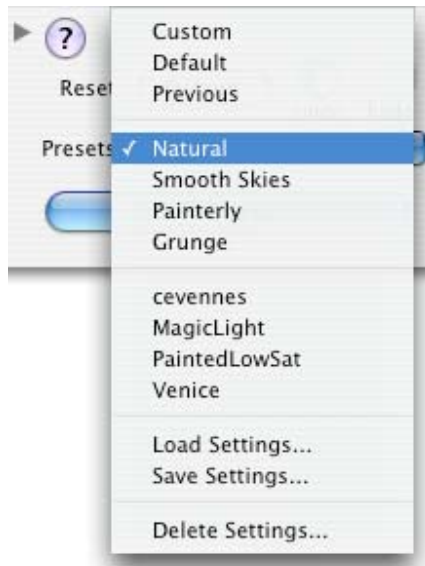
Default: Sets to the default "factory" values.

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

Built-in Presets: Settings for a specific "look". The built-in presets are "Natural", "SmoothSkies", "Painterly" and "Grunge".

List of saved presets: When you save a preset via "Save Settings", the saved preset will be listed under the built-in presets.

Load Settings...: Load settings previously saved via "Save Settings" outside the Presets folder.

Save Settings..: Save settings in the form of a preset either in the Presets folder or elsewhere. When it is saved in the Presets folder, it will show in the list of saved presets (below the built-in presets) for quick access.

Help
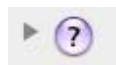
To turn on the context-sensitive help system, select the arrow next to the Help icon. Hover your mouse over a control to see a description and other helpful information.

2.2.2 Details Enhancer controls

The controls for the Details Enhancer tone mapping method are divided into four groups. The general adjustments appear at the top of the Tone Mapping Settings dialog, while further other adjustments ("Tone Settings", "Color Settings" and "Miscellaneous Settings") are located under expandable sections.

<u>General settings</u>
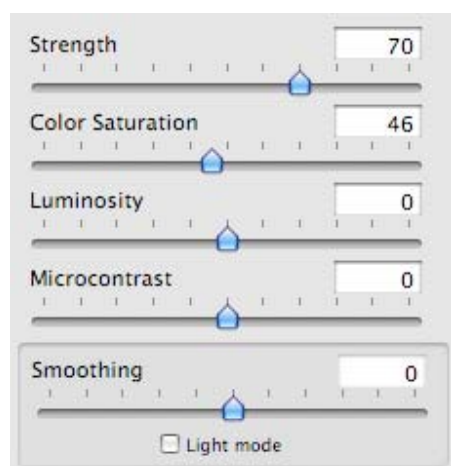
Strength

Controls the strength of the contrast enhancements. A value of 100 gives the maximum increase in both local and global contrast enhancements. The default value is 70.

Color Saturation

Controls the saturation of the RGB color channels. The greater the saturation, the more intense the color. A value of 0 produces a grayscale image. The value affects each color channel equally. The default value is 46.

Luminosity

Controls the compression of the tonal range, which has the effect of adjusting the global luminosity level. Moving the slider to the right boosts shadow details and brightens the image. Moving it to the left has the opposite effect, and gives a more "natural" look to the resulting image. The default value is 0.

Smoothing

Controls smoothing of the contrast variations throughout the image. This setting has an important influence on the look of the tone mapped image. High values give a more "natural" look, low values a more "artificial" or "painterly" look.

Smoothing is available in two modes. The default mode, new to Photomatix Pro version 3.2, is a slider. If the slider is not visible, uncheck "Light mode" in the Smoothing section. The "Light" mode takes the form of labeled buttons and can be accessed by checking "Light mode". The effect on the image differs depending on the mode. The "Light" mode tends to produce a more "surreal" effect.

Microcontrast

Sets how much local details are amplified. A higher value gives a 'sharper' look. The default value is 0.

Tone settings
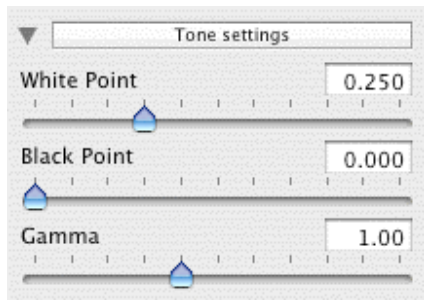
White Point – Black Point

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). The default value is 0.25% for the *White Point* setting and 0% for the *Black Point* setting.

Gamma

Adjusts the mid-tone of the tone mapped image, brightening or darkening the image globally. The default value is 1.0.

Color settings
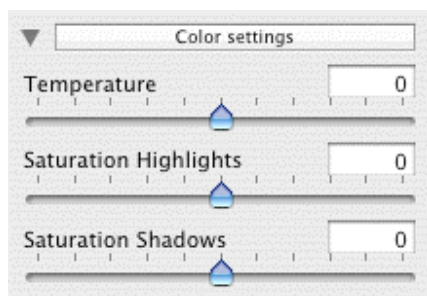
Temperature

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 0 (default) preserves 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 0 increase the color saturation in the highlights; values lower than 0 decrease it. The default value is 0.

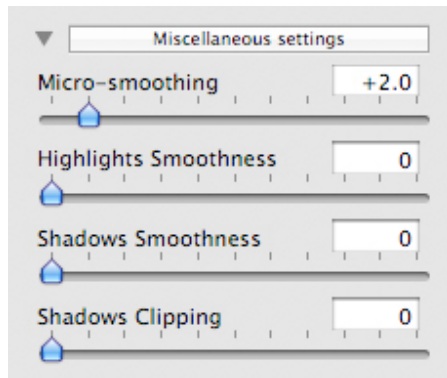*Saturation Shadows*

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. The default value is 0.

Miscellaneous settings

Micro-smoothing

Smoothes 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. The default value is 2.

☆ 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.

Highlights Smootness

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 for preventing white highlights from turning grey, or uniform light blue skies becoming dark blue-grey. It is also useful for reducing halos around objects placed against bright backgrounds. The default value is 0.

Shadows Smoothness

Reduces the contrast enhancements in the shadows. The value of the slider sets how much of the shadows range is affected. The default value is 0.

Shadows Clipping

The value of the slider sets how much of the shadows range is clipped. This control may be useful to cut out noise in the dark area of a photo taken in a low-light situation. The default value is 0.

Other Settings

360° image

Checking this option eliminates the seam between the left and right sides of a panorama viewed in a 360° panoramic viewer. The seam would otherwise show because Details Enhancer takes into account local contrast, assigning different tonal values to the right and left parts of the image. The default value is unchecked. Note that this option is not enabled when the image is in portrait mode, as the option is intended for panoramas.

2.2.3 Tone Compressor controls

Brightness

Adjusts the overall brightness of the tone mapped image. The default value is 0.

Tonal Range Compression

Controls the compression of the tonal range. Moving the slider to the right has the effect of shifting both shadows and highlights toward the mid-tones in the tone mapped image. The default value is 0.

Contrast Adaptation

Adjusts the influence of the average brightness in relation to the intensity of the processed pixel. Moving the slider to the right tends to result in more "pronounced" colors. Moving the slider to the left tends to result in a more "natural" look. The default value is 0.

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). The default values are 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 will give a "warmer", more yellow-orange colored look. Moving the slider to the left gives a "colder", more bluish look. A value of 0 (default) 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. The default value is 0.

2.2.4 Processing and saving the tone mapped image

Once you are satisfied with the settings, click the "Process" button to apply the tone mapping to the complete image (instead of the preview only). You will then be able to save the tone mapped image by choosing *File > Save As*.

☆ If you would like to undo the Tone Mapping, click the "Undo Tone Mapping" item of the "Process" menu on Windows and the "Edit" menu on Macintosh. 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. On the "Save" panel, the File Type menu offers the following options:
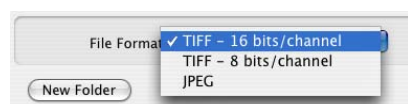

TIFF – 16bit: Best choice for further processing

TIFF – 8bit: For use in applications that cannot deal with 16 bit, or for avoiding too large file size on disk

JPEG: For use on the web without further editing

☆ Choosing *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 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*.
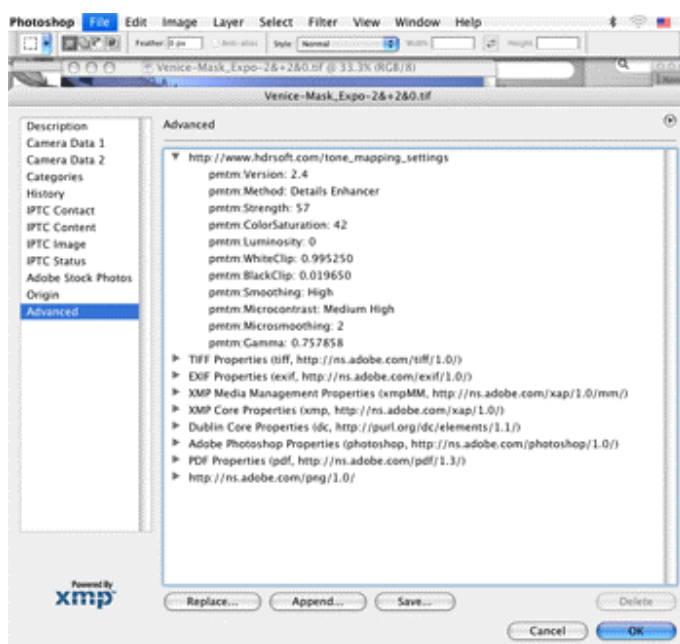
Section 3: Exposure Fusion

Exposure Fusion is the process of combining your photos under multiple exposures into one image with details in both shadows and highlights. The resulting image with increased dynamic range is achieved in one step with Exposure Fusion, whereas HDR Tone Mapping requires two steps. Exposure Fusion was known as Exposure Blending in prior versions of Photomatix Pro.

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

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

On the other hand, Exposure Fusion 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. Also, the memory required for fusing exposures increases with the number of source images and their bit-depth, whereas the memory required for Tone Mapping depends only on the width and height of the image.

> ☆ When your source images are RAW files, you should convert them in your favorite RAW converter before processing them with Exposure Fusion in Photomatix. This is easy to do if you have Lightroom by using the Lightroom Export Plug-in to Photomatix Pro as detailed in section 5.

3.1 Fusing Exposures

To start Exposure Fusion, drag your images to the opened Photomatix Pro application (Windows) or to the Photomatix icon in the Dock (Macintosh). Then, choose "Fuse exposures".

Alternatively, you can also click on the "Exposure Fusion" button of the "Workflow Shortcuts", or choose *Process > Exposure Fusion*.

☞   If you have Lightroom, you should use the Lightroom Export Plug-in to Photomatix Pro for your RAW images. Please refer to section 5 of this manual.

If you have not dragged-and-dropped your images, click the "Browse" button of the "Exposure Fusion – Selecting source images" dialog. An "Open" panel will display to allow you to select your photos taken under different exposure settings. Highlight the image files that you wish to combine. Then click on the "Select" button, and click "OK" to proceed further.

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 even happen when shooting with the aid of a tripod.

Click on "OK" and the "Exposure Fusion" dialog will appear.

Select the Exposure Fusion 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.
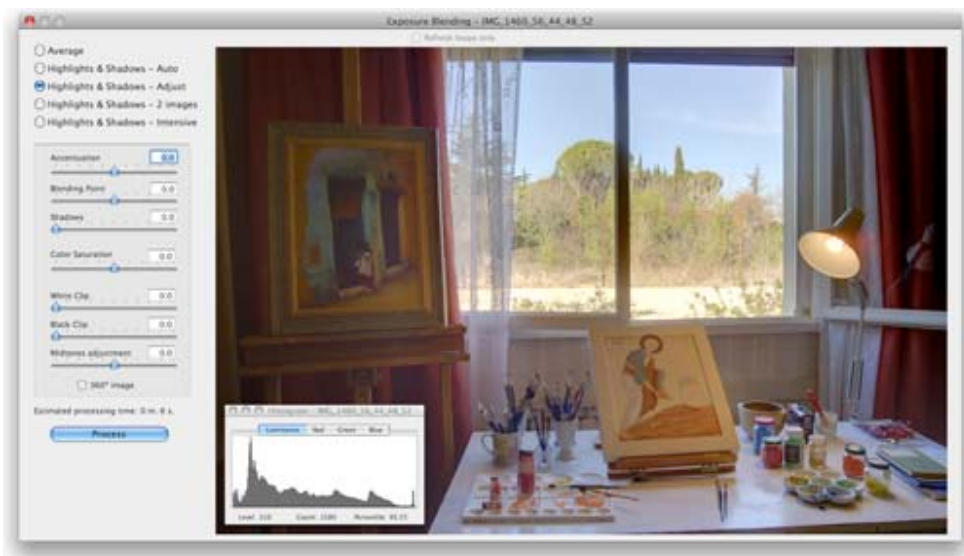
3.1.2 Highlights & Shadows – Adjust

Accentuation

Adjusts the strength of local contrast enhancements. The default value is 0.

Blending Point

Adjusts the weighting given to the underexposed versus overexposed images. When you move the slider to the right, overexposed images are favored, which has the effect of brightening the image. The reverse applies when you move the slider to the left. The default value is 0.

Shadows

Adjusts the brightness of the shadows without affecting the highlights. The default value is 0.

Color Saturation

Adjusts the saturation of the color channels. The greater the saturation, the more intense the color. A value of 0 produces a grayscale image. The default value is 0.

White Clip

Specifies how much the highlights are clipped. Moving the slider to the right increases contrast but removes details in the brightest highlights. The default value is 0.

Black Clip

Specifies how much the shadows are clipped. Moving the slider to the right increases contrast but removes details in the darkest shadows. The default value is 0.

Midtones Adjustment

Positive values brighten the image but reduce the overall contrast. Negative values darken the image but increase overall contrast. The default value is 0.

3.1.2 Highlights & Shadows – 2 Images

This method fuses only two images. The dialog allows you to select which images are fused.

3.1.3 Highlights & Shadows – Intensive

Strength

Adjusts the strength of local contrast enhancements. The default value is 0.

Color Saturation

Adjusts the saturation of the color channels. The greater the saturation, the more intense the color. A value of zero produces a grayscale image. The default value is 0.

Radius

Controls the area used to calculate the weighting of the source images. A higher radius reduces halos, but increases processing times significantly. The default value is 40.

3.2 Processing and saving the fused image

Once you have found a method that gives you results you like, click the "Process" button to fuse to the images at full resolution (instead of fusing a low resolution for the preview). After the files are processed, you can save the fused image by choosing *File > Save As*.

The resulting fused 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. On the Save Panel, the File Type menu offers the following options:

TIFF – 16bit: Best choice for further processing

TIFF – 8bit: For use in applications that cannot deal with 16 bit, or for avoiding too large file size on disk

JPEG: For use on the web without further editing
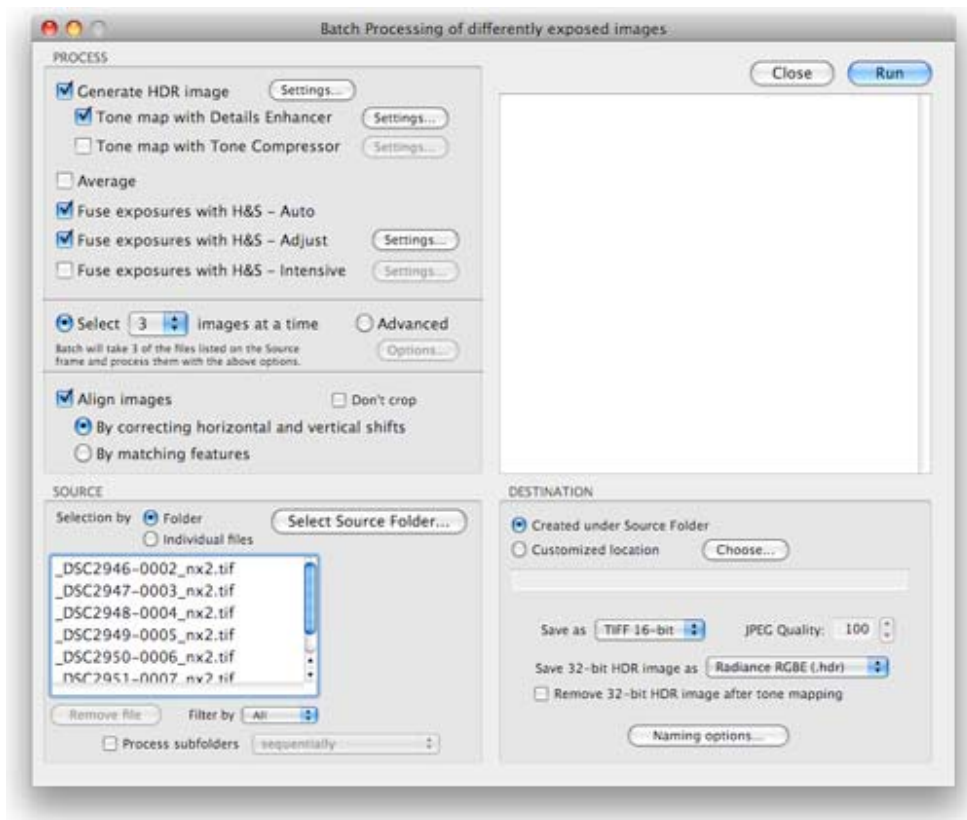
Section 4: Automating with batch processing

Batch processing lets your computer automatically process image files with no user intervention. This can save you a lot of time when you have many series of photos to process. Photomatix Pro offers two different batch modes. Both are available under the "Automate" menu:

- Processing of series of bracketed photos: this is done with "Batch Processing"
- Processing of single image files: this is done with "Single File Conversion"

The "Batch Processing" function, intended for series of bracketed photos, is particularly useful for creating 32-bit 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.

The "Batch Processing" function is also useful for trying different Tone Mapping or Exposure Fusion methods for your source images. This way, you can then select the method that gives the best results for each exposure sequence.

4.1 Using Batch Processing

Choose *Automate > Batch Processing* or click on the "Batch Processing" button on the Workflow Shortcuts panel.

Note: This section describes the batch processing of photos taken under multiple exposure settings. In some cases, you may be interested in batch processing single files instead, such as tone mapping previously created 32-bit HDR image files saved as Radiance or OpenEXR. In such cases, you will have to use the "Batch Single Files" item under the Automate menu instead of "Batch Processing".

To batch process series of bracketed photos, do the following:

1. Select the process(es) you want to run by clicking one or more checkboxes on the left hand side of the dialog.

2. Using the pull-down menu below the checkboxes, select the number of multiple exposures to be combined. For instance, select 3 if your bracketed shots consist of three exposures each, i.e. when you have taken for each scene one photo at median exposure, one underexposed and one overexposed. Select "Advanced" for additional selection criteria, including automatic bracket detection and selective processing. Configure advanced options by selecting "Options".

3. In the "Source" frame, select the location of the folder where your bracketed photos are. The batch will arrange the files of this folder in alphabetical order. It will process *N* files at a time, *N* being the number you specified in step 2.

4. If you want to save the results in a different folder than the folder containing your source photos, select the "Custom location" option in the "Destination" frame at the bottom right. If you leave the default option, "Created under source folder", then the batch will create a subfolder with the name "PhotomatixResults" and will store the resulting images in this folder.

5. In the "Destination" frame, select the output file type.

6. Click the "Run" button to start batch processing.

While the batch is running, the results area below the "Run" button will display the processing done.

4.2 Settings specific to Batch Processing

The "Settings..." buttons allow you to specify the settings for HDR generation, Tone Mapping, and Exposure Fusion. Please refer to sections 2 and 3 for a description of these settings.

In the case of the settings for Generate HDR, there are a few settings that are specific to Batch Processing and are described below:

Force Exposure Values spacing to:

The 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.

Source images are linear (no tone curve applied)

This option is intended for 16-bit TIFF files that have been converted from RAW files with a RAW converter that allows the image to be left in linear space (note: very few RAW converters allow this). 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.

Note: the term "linear" may have 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, so you should never check this option with files converted with Photoshop or Lightroom.

Process strip by strip

Check this option if the source images are large TIFF files. 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. Note, though, that the alignment functions are not accessible when the "Process strip by strip" option is used.

4.3 Batch processing subfolders

When your bracketed series are located in multiple folders, they can all be processed in one run, provided they are in subfolders of the same parent folder. To do that, check the "Process subfolders" option at bottom of the "Source" frame on the Batch Processing dialog and select "sequentially".

When "Process subfolders sequentially" is selected, the batch will process the bracketed image files in one subfolder and then move on to the next subfolder, all of which are contained in the main parent folder.

> ☚ When your bracketed sets are composed of varying numbers of exposures (for instance, one set has three exposures and another five exposures), you can use "Process subfolders sequentially" to combine the exposures in these sets in one run. To do that, place each set in a separate subfolder, group the subfolders under a parent folder, check "Process subfolders sequentially" and select "All" in the pull-down menu for the number of images to process at a time.

If you are processing bracketed photos that will be part of a panorama, you may find it useful to be able to organize your photos in such a way that all exposures of the same levels are under

the same folder. Let's take as an example a panorama composed of four views that need to be stitched, with each view having been taken under three exposures: -2, 0, +2. You will then have 12 photos, and may need to place them in three separate subfolders composed of four photos each as follows:
- subfolder1 contains four photos part of the panorama taken at EV -2
- subfolder2 contains four photos part of the panorama taken at EV 0
- subfolder3 contains four photos part of the panorama taken at EV +2

If you check "Process subfolders" and select "grouped by exposures", the batch will combine the first file of subfolder1 with the first file of subfolder2 and the first file of subfolder3. The batch will then combine the second file of subfolder1 with the second file of subfolder2 and the second file of subfolder3, and so on for the third and fourth file of each subfolder.

Section 5: Tips and Techniques

5.1 Integrating Lightroom with Photomatix Pro

If you have Lightroom, you can export photos for processing in Photomatix Pro directly from Lightroom, and have them re-imported back into the Lightroom library if you wish to.

The Lightroom Export plug-in to Photomatix is free and delivered in the Photomatix Pro package. Please refer to the HDRsoft website at http://www.hdrsoft.com/download/lrplugin.html for the installation instructions and a short tutorial showing how to use the Lightroom export plug-in for HDR processing in Photomatix Pro.

5.2 Using Photomatix Pro with a single image file

When your scene is not very high contrast, it is possible to use Photomatix Pro with a single shot, provided this has been taken in RAW mode. There are three ways to do that:

- Technique 1: Open your RAW file in Photomatix to convert the file into a pseudo-HDR image, then tone map it.
- Technique 2: Convert your RAW file into a 16-bit image in your favorite RAW converter, then open the 16-bit TIFF or PSD file in Photomatix Pro and tone map it.
- Technique 3: Create two or three exposures in your RAW converter and combine them in Photomatix as if they were "real" exposures, then process them in Photomatix.

Technique 3 generally gives the best results. Also, it has the advantage of working with Exposure Fusion. Technique 3 is particularly recommended if you have Lightroom. Moreover, the Lightroom export plug-in simplifies the workflow greatly.

For good results with the above techniques, it is important to ensure the lowest noise level at capture time. To do that, set the lowest ISO possible (ISO 100 for instance) and expose for the shadows when taking the RAW image, i.e., overexpose your shot. Even though the histogram of your camera may indicate that highlights will be lost, you should still be able to recover them during RAW conversion (unless the scene is too high contrast, but then a single image will not be sufficient for good results with Photomatix).

## 5.3 Processing RAW files in third-party RAW converters

Even though Photomatix Pro can process RAW files from most camera models, we recommend converting RAW files using a third-party RAW converter (such as Photoshop, Lightroom, Aperture, DxO or other applications specialized in RAW conversion) before processing them in Photomatix Pro.

When a third-party RAW converter is used, RAW images should be developed with the following settings (the screenshot shows the settings in Lightroom):

- *WB (White Balance):* Same WB for all source photos.
- *Basic settings*: Should be all set to 0.
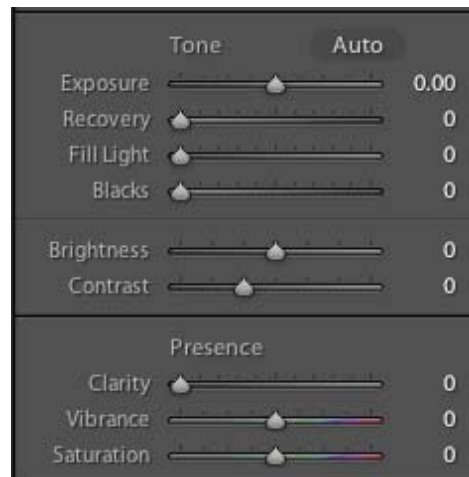
- *Curves*: Both Parametric and Point Curves should be linear.
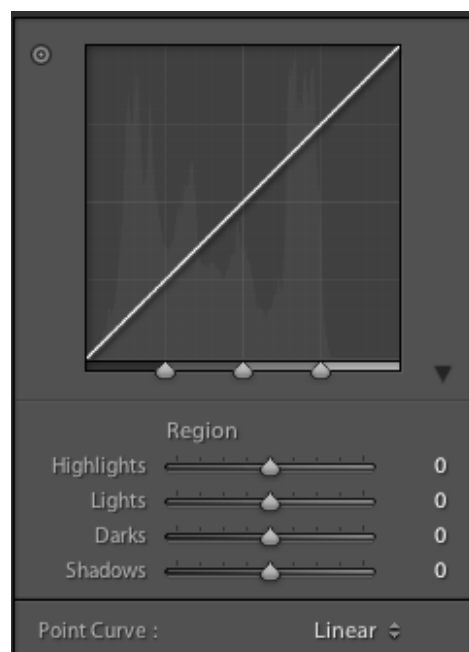
5.4 Dealing with noise

When you process your images using Exposure Fusion, the fused image will tend to show less noise than the source images. This is because Exposure Fusion works by directly combining your bracketed photos, and thus averaging out noise.

However, when you create a 32-bit HDR image, your bracketed photos are assembled in linear space into an image that spans the full range of luminance values captured by the camera. If the lightest photo of your exposure sequence is not bright enough to expose the shadows of the scene, then the noise in the source photographs will be transferred to the HDR image. Noise in the HDR image will then be made more apparent by tone mapping, especially with Details Enhancer as this tone mapping method increases local details.

Though Photomatix Pro includes an option to reduce noise on the generated HDR image, it is still always better to avoid noise at capture time as much as possible. There are two tips to ensure a low noise level:

- Tip 1: Set a low ISO setting (ISO 100 or lower) whenever possible

- Tip 2: Overexpose sufficiently, ensuring that the lightest image of your exposure sequence has its shadows in the mid-tones.

5.5 Photomatix Pro and color management

Photomatix Pro supports color management even if RAW files are processed. You should use the same working space 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 created only for the web.
- *Adobe RGB*: Popular working space for printing if extremely saturated colors are not used.
- *ProPhoto RGB*: 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

You can find more tips and techniques, and regularly updated information, in the Photomatix Pro FAQ on the HDRsoft website at http://www.hdrsoft.com/support/faq_photomatix.html.