
AcceleratedVision
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DIVE
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Guide to the special functions of the programmes

HDR professional/HDR

Our eyes see HDR, but our cameras for images or video sequences do not: they are hopelessly inferior to the dynamic and contrast range of our eyes, which can also see detail in dark or light areas. These areas appear underexposed to black or overexposed to white in the image because the cameras cannot realistically reproduce large exposure differences in critical shooting situations.

The HDR programmes from Accelerated Vision compensate for this shortcoming: With the **HDR professional** and **HDR** software, you can achieve fantastic images in the best possible image quality with little effort. The best way to do this is with exposure bracketing, but you can also turn loaded single images into real eye-catchers with an unimagined wealth of detail and contrast in a flash.

The software supports and encourages your creativity with unique presets, allowing you to sit back and rely on automatic optimisation.

However, HDR also gives you every freedom to intervene individually where you think it makes sense or want to experiment, such as with HDR generation, experimenting with HDR fusion methods and much more.

The option of loading exposure sequences from videos and converting them into unique HDR single images opens up further application possibilities.

This guide describes the core competences of the HDR programme. These are the modules and effects that make this software unique and set it apart from others:

- **Edit exposure bracketing**
- **Ghosting correction**
- **Edit weights**
- **HDR-Styles**
- **Tone-mappings**

To begin with, the flash workflow shows that you can achieve a finished and impressive result in three to four steps if you rely on the automatic system and do not want to intervene manually.

Notes: The cross-programme modules and functions, such as Finalise or Expert mode. RAW module or basic functions of the presets and others can be found in the corresponding guides.

Loading image sequences from videos is only possible in the Professional version.

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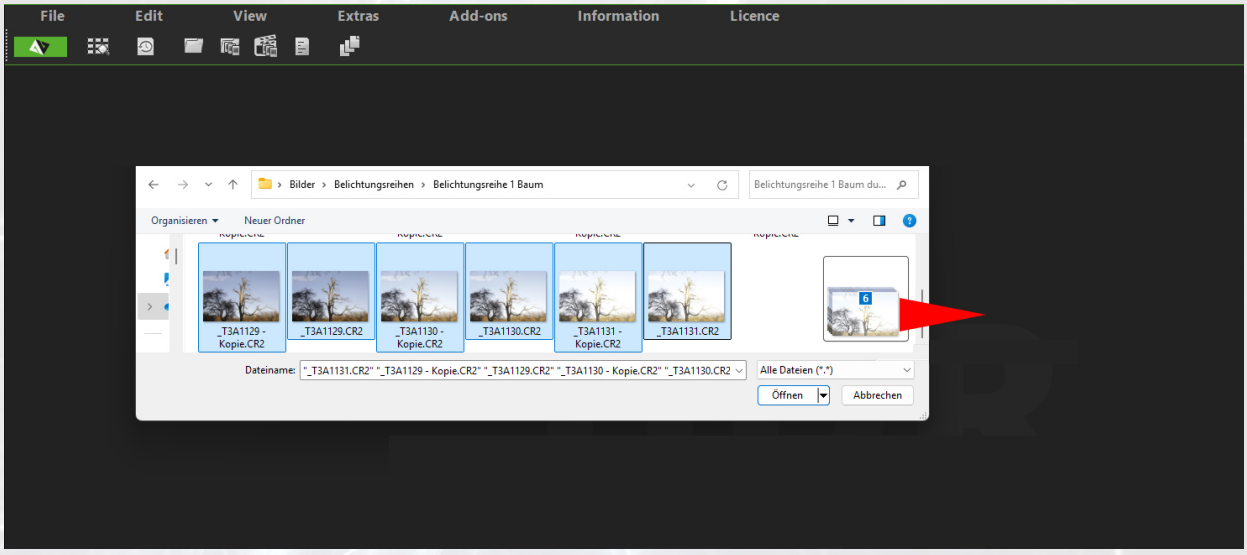
1. Flash workflow - quickly to the finished HDR image

If you want it to be really quick and automatic, you can create the finished HDR image with **3 clicks**:

1. **File import:** Load single images, exposure series or image sequences from videos.
2. **Apply default settings**: In Post Processing, apply the default **HDR style Balanced** and the default **preset Natural Balanced**.
3. **Save or select an image section/scaling suggestions beforehand - done!**

In most cases, you will achieve very good results with these 'quick steps'.

Note: The steps listed in the flash workflow are described in detail in the **General files guide**. The individual steps or special features can be found here in abbreviated form:



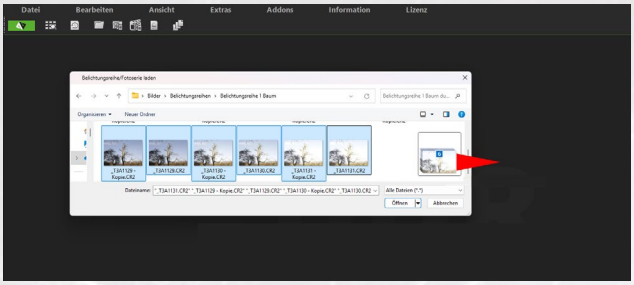
Step 1: File import

Load bracketing or single image: There are various ways to load an exposure bracket or a single image, all of which are of equal value. You decide which method is quickest or easiest for you.

Drag & drop: With the method selected in the example, you simply **drag & drop** the image files onto the programme window. To do this, select all the images in an exposure series or the individual image and drag them into the programme window by holding down the left mouse button. Seconds later, the resulting image is displayed with the current default settings.
The file import for video sequences is described in the chapter **Editing video sequences.**

If you have defined a folder for the exposure series/photo series or individual images in the Extras/Settings/**Programme** menu, this folder will always be selected automatically.

Step 2: Apply default settings



Once you have loaded the exposure series consisting of 6 images (maximum 250 images), the result is displayed in post-processing with the image-defining presettings

- **HDR-Style**: **Balanced**
- **Preset**: **Natural Balanced** with the effect AI-Tonemapping - balanced
- **HDR-Algorithm: Entropie** (rating according to information content)

The **Optimisation assistant** and **Ghost image correction** are deactivated by default.

If you are satisfied with the result, go straight to step 3.

If you want to take a little more time, try out different **presets**, for example from the corresponding category (**landscape** in the example) and **HDR styles**, to judge whether a few more clicks will produce a resulting image that is even closer to your personal taste or offers exciting alternatives.

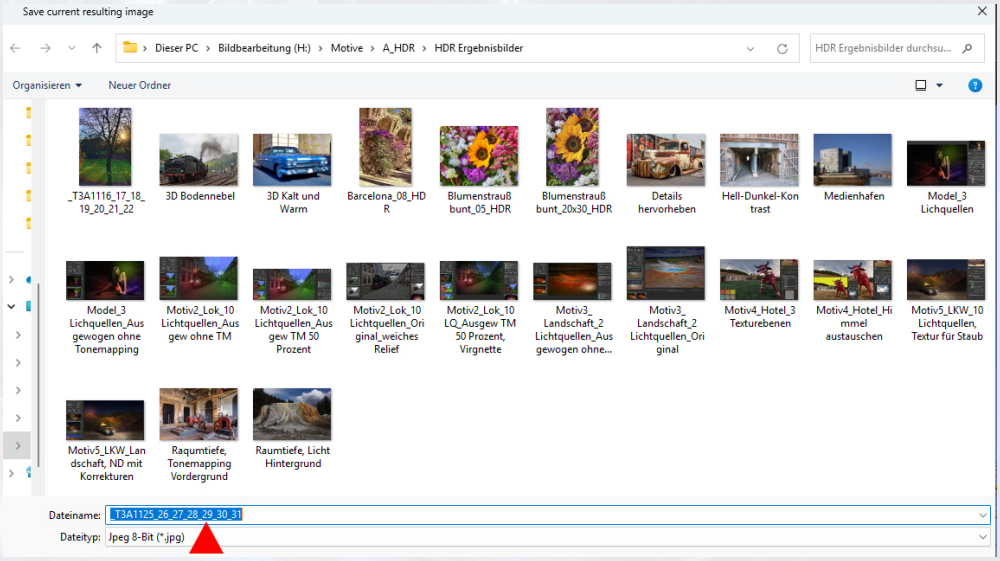
Click on the **save button** to switch to the save options.

Note: In the following chapters, the listed image-determining factors and other possible influences are discussed in more detail.

Step 3: Save the resulting image - done!

Click on the green **Save button** to automatically switch to the Image cropping and subtitles window.
Here you are offered further options such as **customised image cropping**, **title input** or, by clicking on **Scale and save**, scaling presets, e.g. for **social media formats** such as Facebook, Instagram or Twitter, which you can use if required.

If you decide in favour of these offers or are satisfied with the resulting image without further intervention, click on the second **green Save button,** switch to the selected folder ...

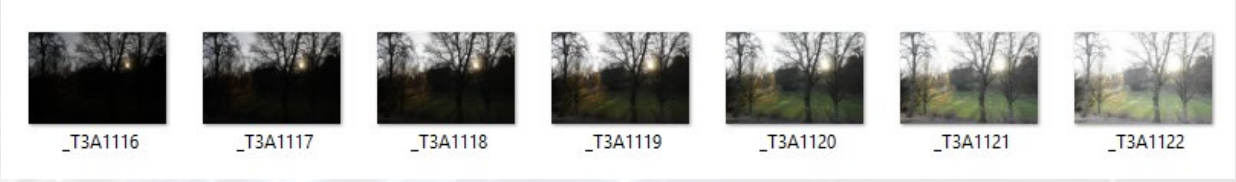


... and either accept the file name, which in the case of exposure series as in the example contains all the images in the exposure series, or assign a ‘descriptive’ name, which makes it easier to find your way around later.

2. Edit exposure bracketing

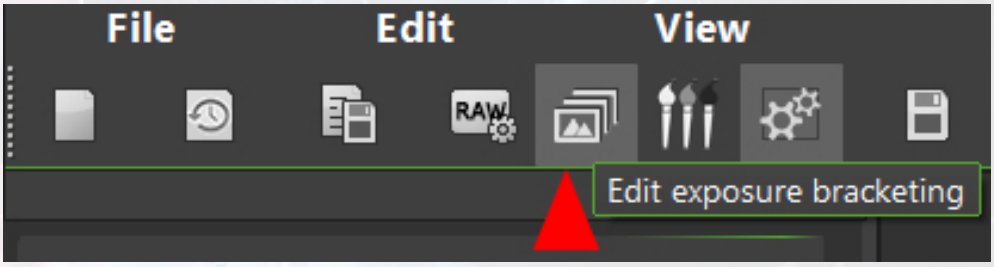
What happens in HDR during the creation of an HDR image before the impressive resulting image of an exposure series like the one in the image example, which consists of 7 individual images, becomes visible in post-processing?

In an exposure series, each image contains areas with a different number of pixels that are **overexposed** or **underexposed**.



As a rule, each area of a subject is correctly exposed on at **least one image**.

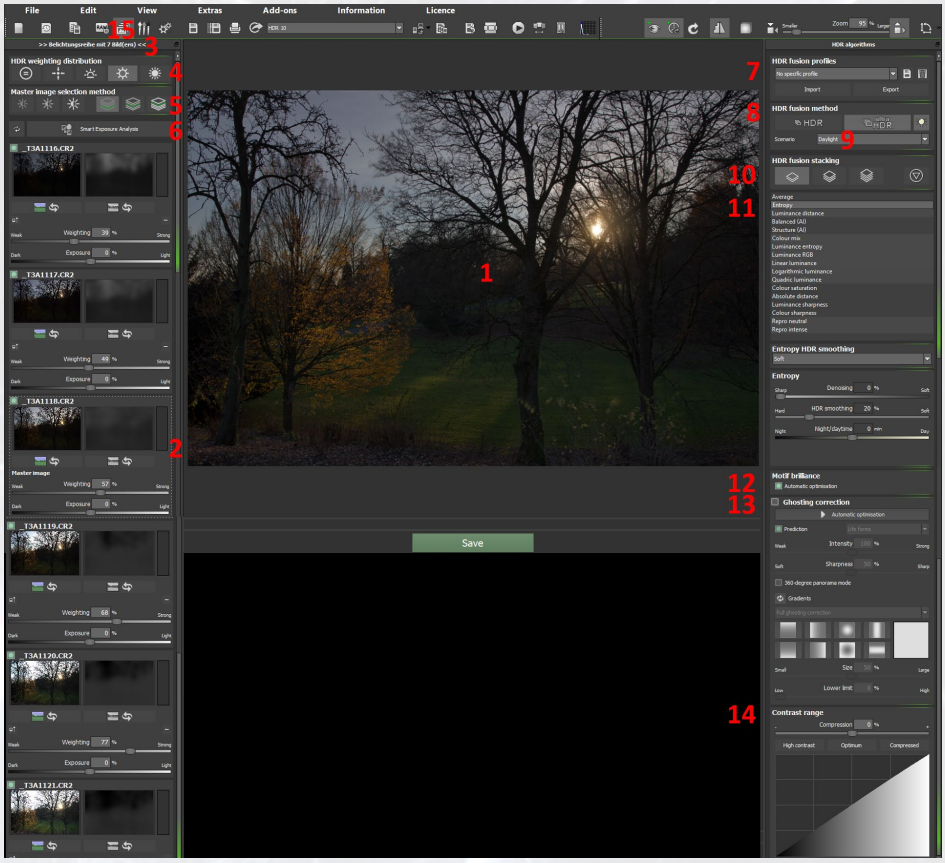
At the 'heart of the programme', **HDR** uses a complex process to combine all correctly exposed pixels into a 'fully exposed' overall image. The type of calculation is determined by the algorithms. Different algorithms produce different HDR results.



If you do not want to rely exclusively on the automatic HDR fusion or, for example, correct ghost images, after loading an exposure series as in the image example, a single image or a video sequence, click on the **Edit exposure bracketing** button to switch to the **image fusion** module and editing window of the same name, where the different exposures are combined into one image.

Edit bracketing – Overview

After switching, the image in the **programme window shows the HDR fusion image with the standard default settings, on the left the individual images of the loaded image sequence** with various options for influencing them, **on the right the algorithms** for calculating the HDR fusion, various methods such as **ultra-HDR**, ghost image correction and other options, all of which only become visible after scrolling down as shown in the 'extended' graphic.



1. Programme window **with HDR fusion image**.
2. Individual images of the loaded image sequence with **master image**.
3. Display of the loaded single images (7 in the example).
4. Distribution of the HDR weighting. Standard: Mid tones dominate.
5. Master image selection procedure. Standard: **One image brighter than optimum exposure**.
6. **Smart Exposure Analysis, which checks the images for blurring.**
7. HDR fusion profiles. Customised profiles can be saved here.
8. HDR fusion method. Standard: **ultra HDR**.
9. Scenarios such as **daylight** (standard), blue hour, night shot.
10. HDR fusion stacking. Standard: **Level 1** (improves homogeneity).
11. HDR algorithms (fusion process). Standard: **Entropy**.
12. Subject brilliance. Standard: **Automatic optimisation activated**.
13. **Ghost image correction**. Default: **Automatic deactivated**.
14. Contrast range: Optimisation of the dynamic range.
15. **Edit weights** option (see next chapter).

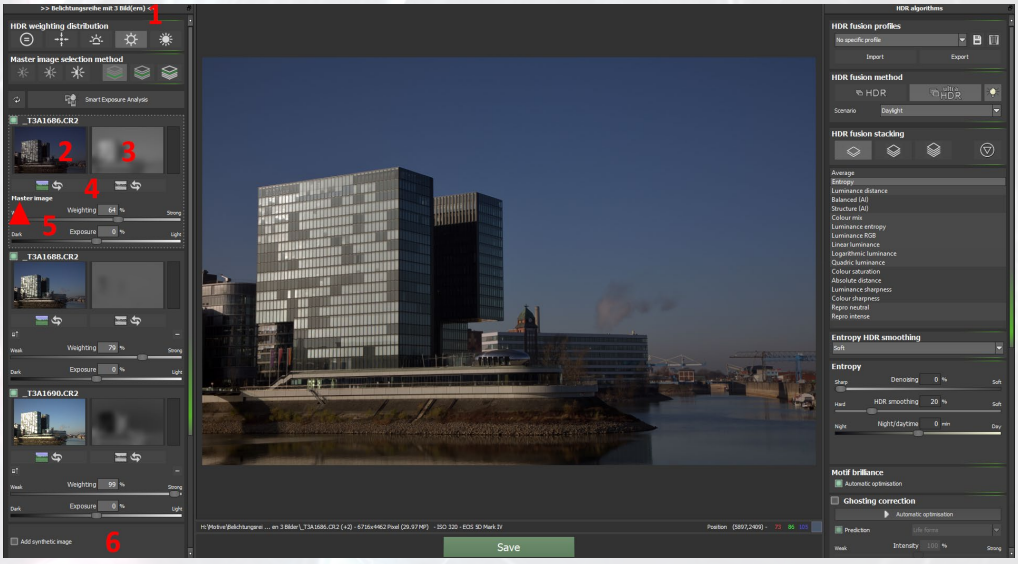
‘Normal’ workflow

If you regularly work with exposure brackets, it is of course exciting to try out the numerous setting options, assess the effect live in the image and, if necessary, change the parameters to best suit your personal taste.
Normally, however, you won't go wrong if the standard settings are used and you limit yourself to a few corrections depending on the subject:

1. Use the **Smart Exposure analysis** to check whether, for example, blurred or incorrectly exposed images are preventing an optimal result.
2. **Activate ghost image correction** for exposure series with ghost images.
3. Click through the HDR algorithms to try out whether an algorithm other than the preset entropy is better suited to the characteristics of the loaded exposure bracket, e.g. Balanced (AI).
4. **Edit weights**: For exposure series in which, for example, clouds have moved during the duration of an exposure series, you can quickly fix a desired position in the Edit weights module and apply it to all images in the series.

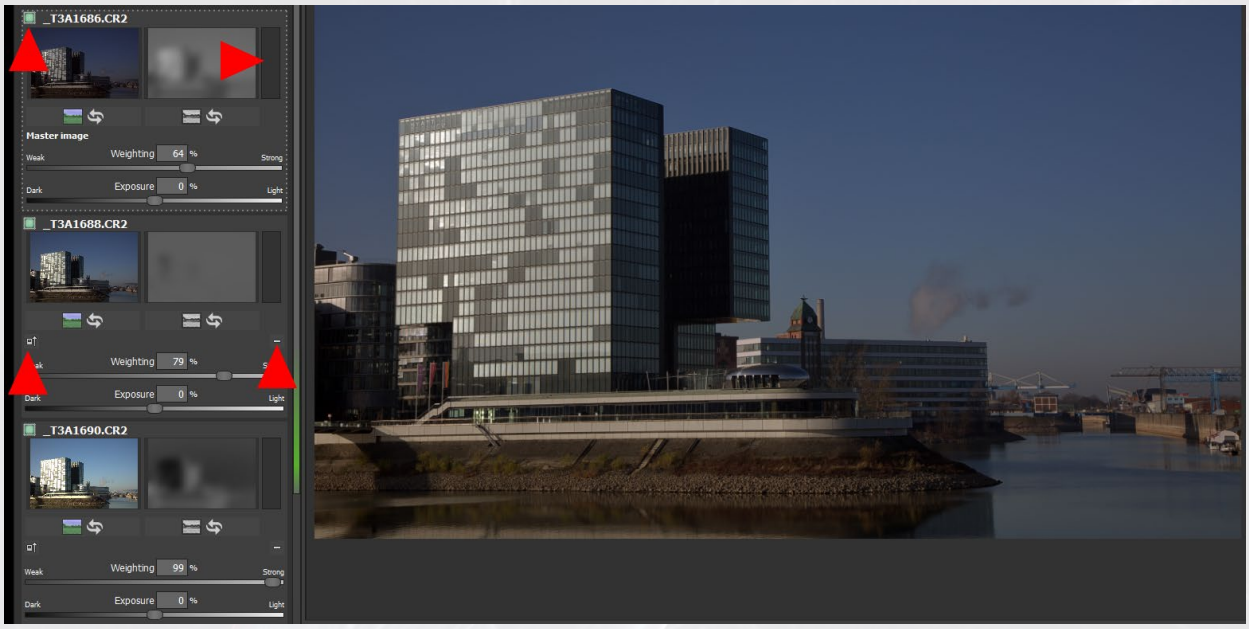
Note: Ghost image correction and **editing weights** are described in separate chapters so that they can be called up more specifically and are ‘skipped’ in the descriptions in this chapter.

Left side: Information and influencing factors of the active single images



1. Display of the **number of individual images** in the exposure series, in the example 3.
2. Exposure bracketing thumbnails.
3. **Weighting matrix** (mask) associated with the individual image.
4. **Transfer window** for selective drawing.
5. **Weighting** and **exposure** parameters.
6. Add synthetic image (is deactivated by default).

System and general setting options



In the display of an exposure bracket, you will see the individual image with the greatest overexposure at the top, the master image with the white dotted border in the centre (as a rule) and the underexposed individual images further down.

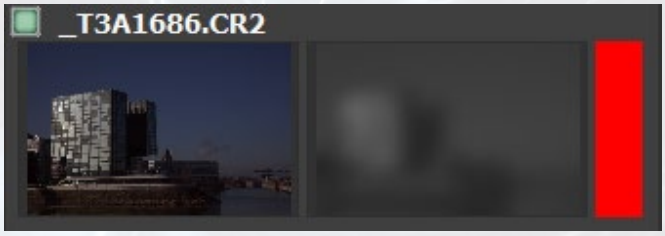
Exclude/include image from the calculation: The **green coloured** area in front of each individual image indicates that all images are activated and included in the calculation.

Click on the **green button** to turn it grey and exclude this image from the calculation. If you click on the grey button again, it turns green again and the image is actively included in the calculation.

Convert another image to the master image: By clicking on the small tick below the green button of an active image from the exposure series, this image becomes the new master image.

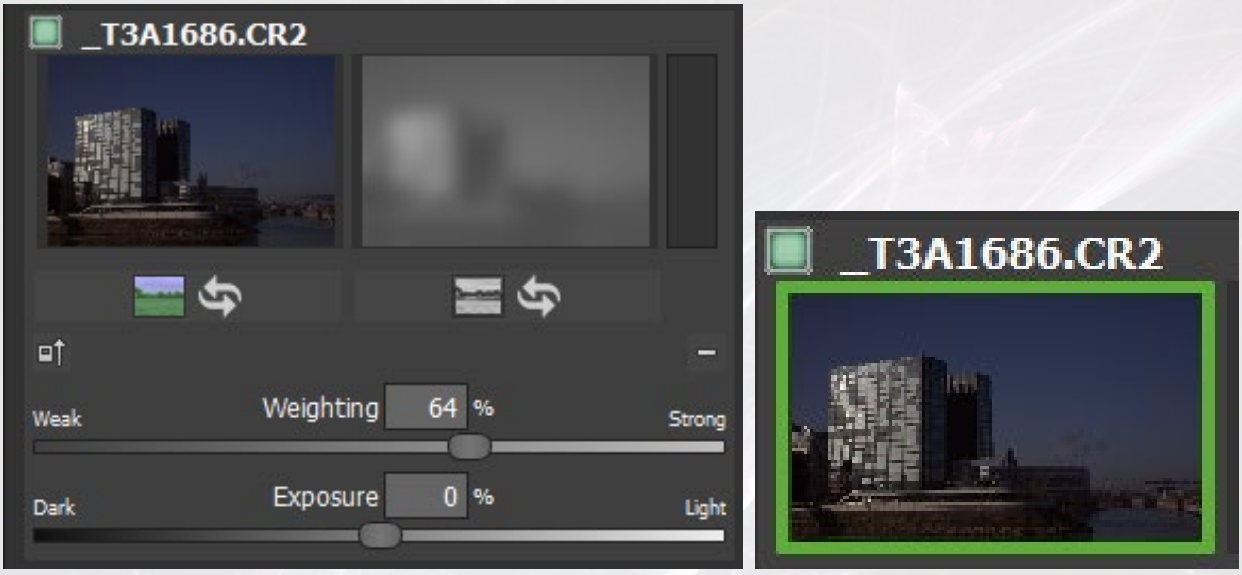
Delete image: By clicking on the **minus sign**, the corresponding image is deleted and no longer included in the calculation. **The master image cannot be deleted.**

Set weighting colour: Click in the area to the right of the mask ...



... a weighting colour is defined for the **HDR weighting drawing mode**, which can be used to fix moving objects, for example. Click again to hide the colour. The first colour is red, the others green and blue. The handling is described in the chapter **Editing weights**.

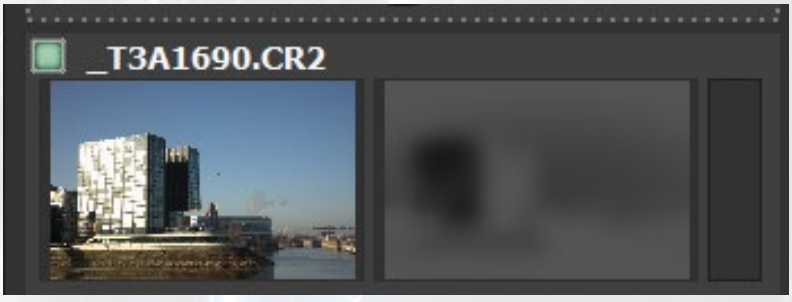
Thumbnail view and factors influencing HDR fusion



Each bracketing image has a thumbnail view, a weighting matrix and two sliders with which you can influence the HDR fusion:

Thumbnail view in image size: Left-click on the thumbnail to outline it in green and display it in full size in the programme window. Left-click on the thumbnail again to switch the image view back to the HDR fusion image.

Weighting matrix: To the right of the thumbnail of the **underexposed image**, you can see the HDR weighting matrix of the exposure bracketing image. **Light-coloured pixels** mean that this area is very strongly included in the HDR result image, in the example the front of the building and somewhat weaker the sky. **Dark pixels** mean that this area is only weakly included in the resulting HDR image, in the example mainly the area below and to the side of the building.

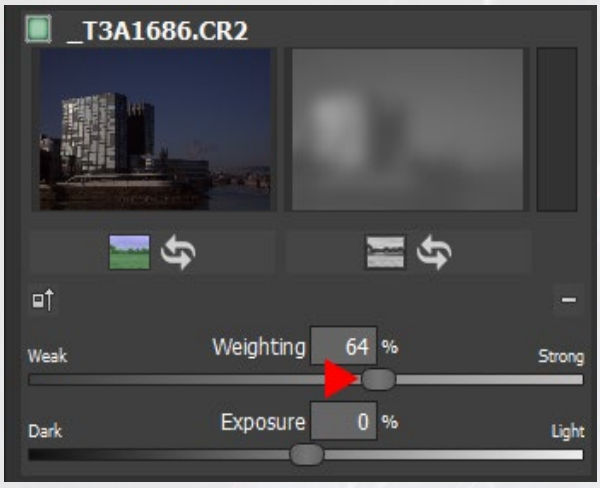


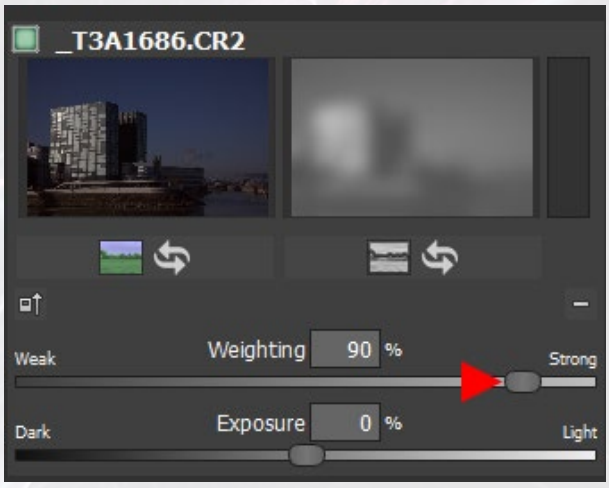
In the **overexposed image**, almost only the dark areas have so much detail that they are included in the fusion, which is visualised in the matrix by the bright pixels. These are the areas below and to the side of the building, which played almost no role in the underexposed image, and large parts of the sky, which contribute to the fusion in all individual images.

Note: All weighting matrices and thus the fusion image are related to the **HDR algorithm** (default: entropy).

Influencing weighting and exposure

If required, you can influence the automatically calculated weighting and exposure of the individual images of a loaded exposure bracket using the two parameters **Weighting** and **Exposure**.



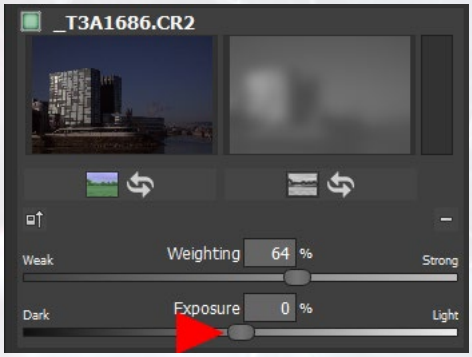


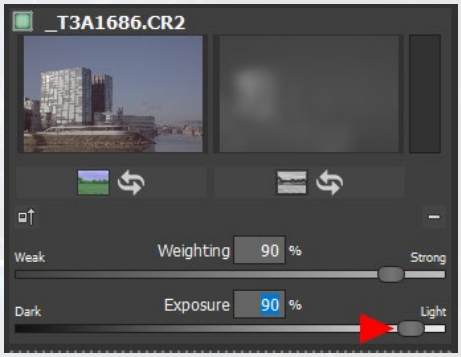
Weighting: You can see the proportion of the image used in the HDR fusion in the mask (**weighting matrix**) to the right of the preview image, in the example 64% (graphic on the left).

If you move the **Weighting slider** to the right, the weighting is increased and **more of this image** is included in the HDR fusion. You can also recognise this by the brighter weighting matrix. **Bright here does not mean that the image is brighter, but that these parts of the image are included in the HDR fusion to a greater extent.**

If you move the slider to the left, the **weighting is reduced** and the image is included to a lesser extent in the HDR fusion.

Note: Changing the weighting of **one image** causes the weighting of **all other images** in the exposure series to be adjusted.





Exposure (EV = Exposure Value): If the **exposure slider** is moved towards **bright** (diagram on the right), the HDR fusion result also becomes brighter. Accordingly, the result becomes darker when the slider is moved towards **dark**. If required, you can make this adjustment for each image in the series and thus have a major influence on the HDR fusion.

Transfer for single images and masks for selective drawing

These transfer buttons save time.

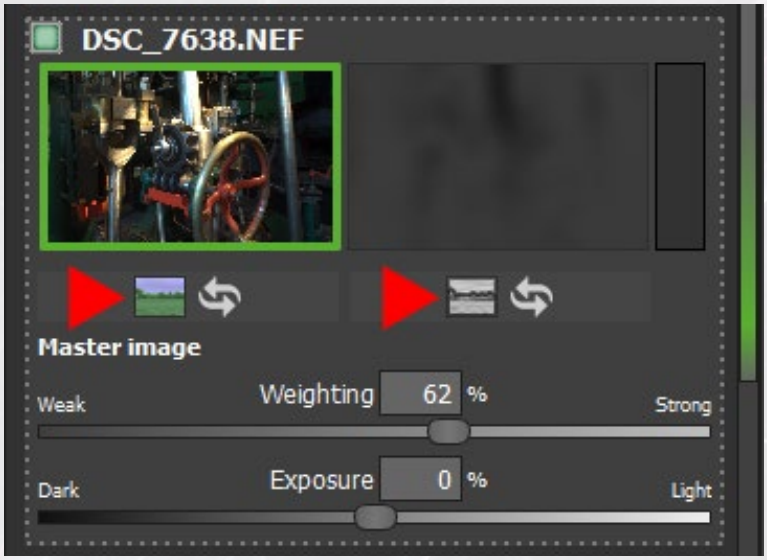


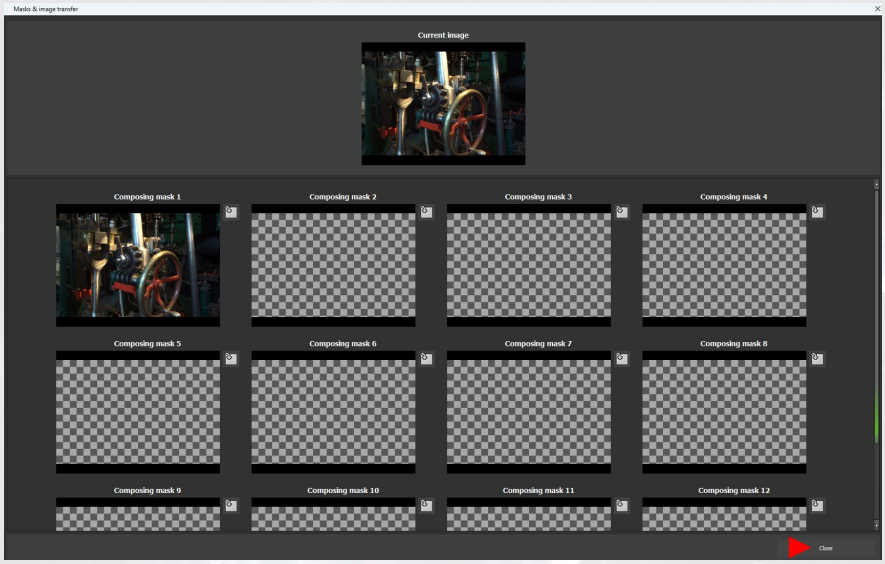
Image transfer: Click on **the left-hand button** to transfer a **desired image** from the current image sequence (in the example, the master image) to a composing mask for **selective drawing**.

Mask transfer: Click on the **right-hand button** to transfer the **corresponding mask** with the set weighting for selective drawing to one of the available masks, e.g. to the **effect masks**.

Example image transfer:

The master image above is to be transferred to a composing mask in order to manipulate parts of the selected preset image.

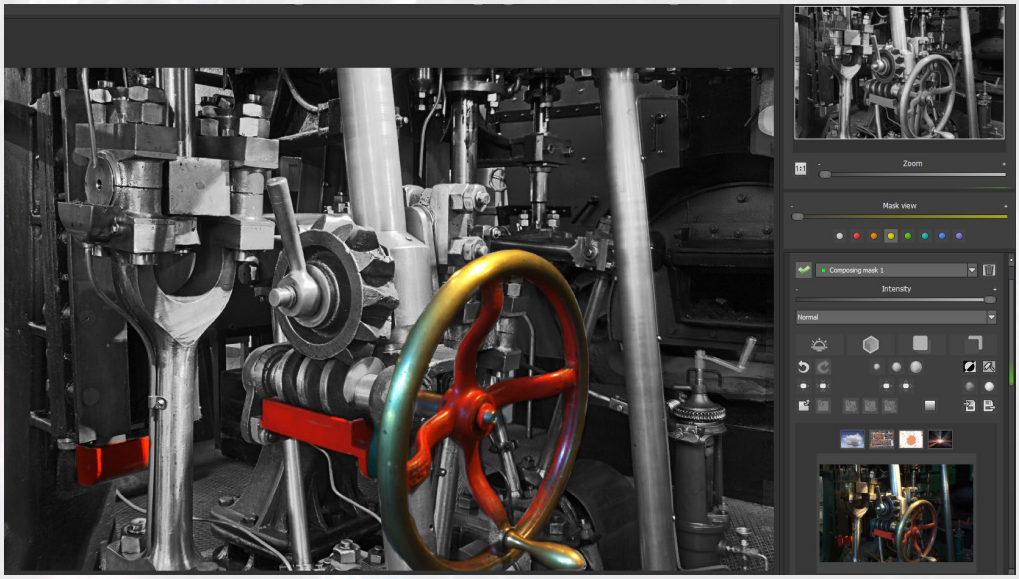
Step 1: Select the preset that is to be changed with the master image, in the example **Monochrome Highlight details** for better visualisation.



Step 2: Image transfer.

Click on the **Image transfer button** on the left to open the **Masks & image transfer window** with the selected master image at the top as the **current image**.

Click on the arrow of one of the available composing masks to transfer the current image in **Selective drawing** to this composing mask and click on **Close** to return to **Edit bracketing**.

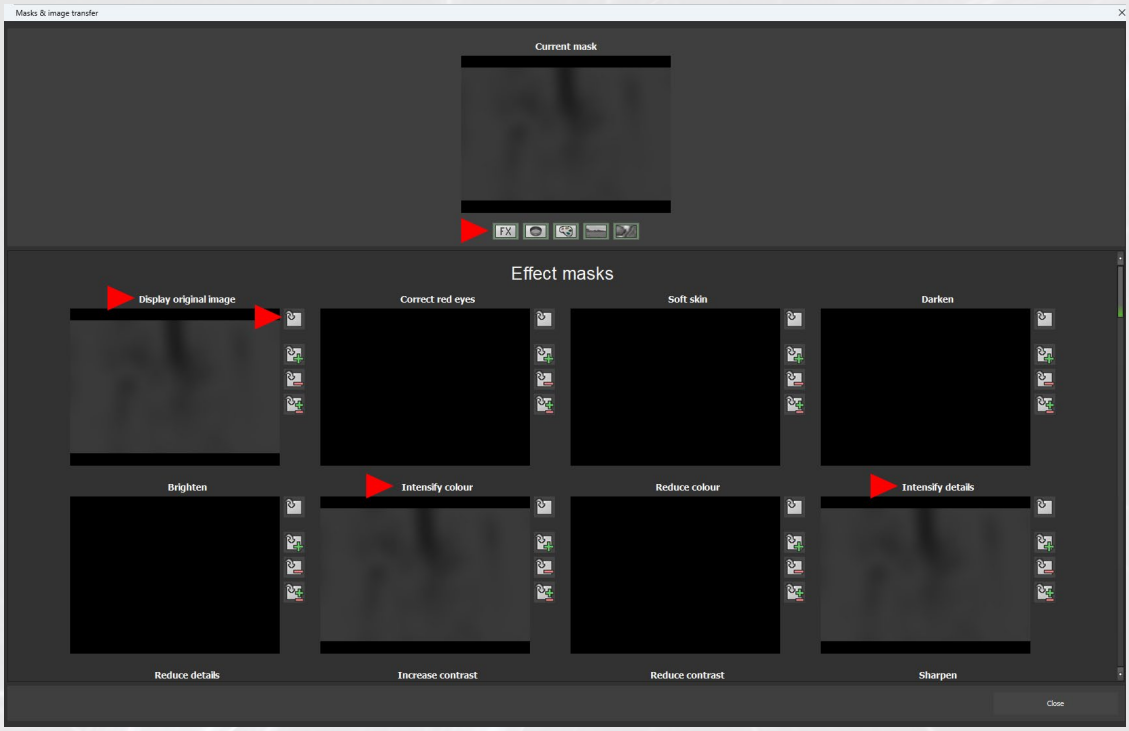


Step 3: Make the desired changes.

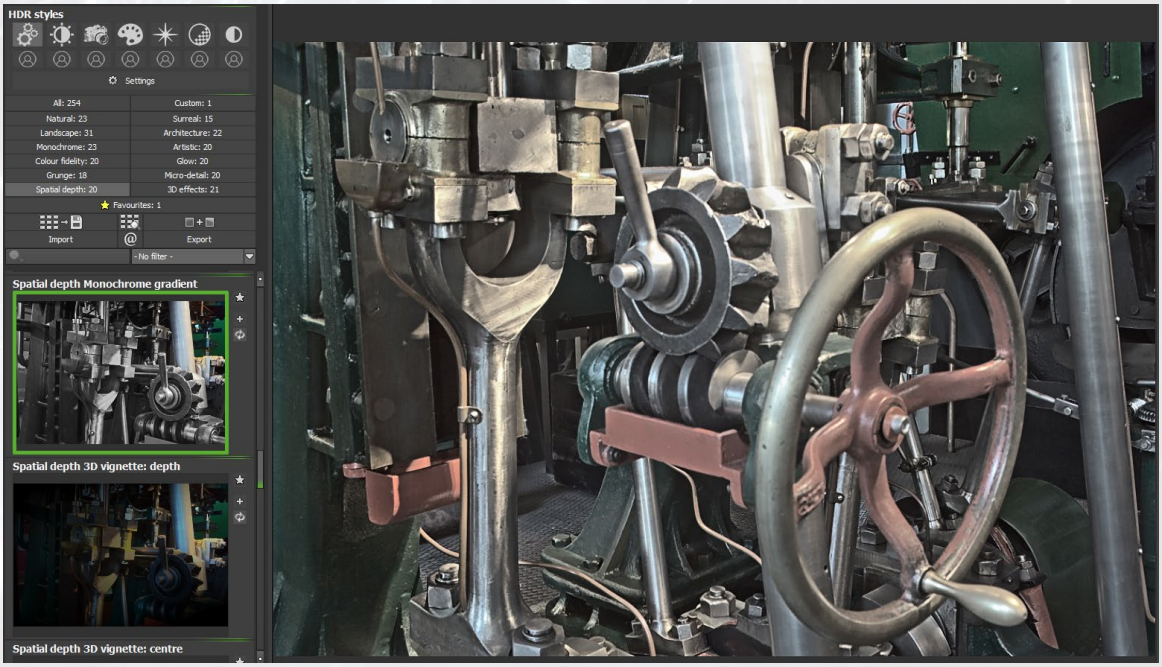
After switching to **post-processing** and the composing masks in **Selective Drawing**, you will see the preset image in the top right-hand corner of the image view thumbnail and the master image in the composing mask. In the example, selected areas of the image have been painted in with the colour of the master image using the brush, which can lead to attractive and exciting composing images.

Example mask transfer

Step 1 with the selection of a preset is identical to the image transfer.



Step 2: Click on the **Mask transfer button** on the right to insert the mask in the **Masks & image transfer** window at the top as the **Current mask**. Select the desired mask from the mask areas listed below, in the example **FX effect masks**. If required, you can combine several effects here, such as fade in **original image**, **enhance colour** and **enhance details**.



Step 3: Now all you have to do is close the window, switch to **post-processing** and you will see the finished result image with the previously selected preset, which you can of course still change.

Distribution of HDR weighting

The distribution of the image weighting within the HDR fusion can have a major influence on the resulting image, so it is worth trying it out.

As a rule, however, you can use the standard default setting Dominate **mid tones** (**4**).

You can choose between 5 options:

1. **Even distribution:** All images are included in the HDR image with the same intensity, which achieves a good result for any type of exposure bracketing. Disadvantage: With dark exposures, some of the image noise can be carried over.
2. **Master image dominates:** The centrally exposed image (master image) dominates the HDR fusion, but contains additional details from the dark and light images.
3. **Dark images dominate:** In this distribution, most of the information is taken from the dark images of the exposure series with the result that the resulting image contains maximum detail, but also takes on the tendency of image noise in dark images.
4. **Mid tones dominate: With this preset weighting, the most important information from the optimally exposed images of the exposure series in the mid-tones is utilised.**
   At the same time, this process has a noise-reducing effect and is very suitable for dark subjects with higher ISO values.
5. **Highlights dominate:** Here, the HDR fusion focusses on the bright images and mainly determines the details there.
   Advantage: Very dark exposure series are brightened and optimised for further processing**.**

Master image selection method

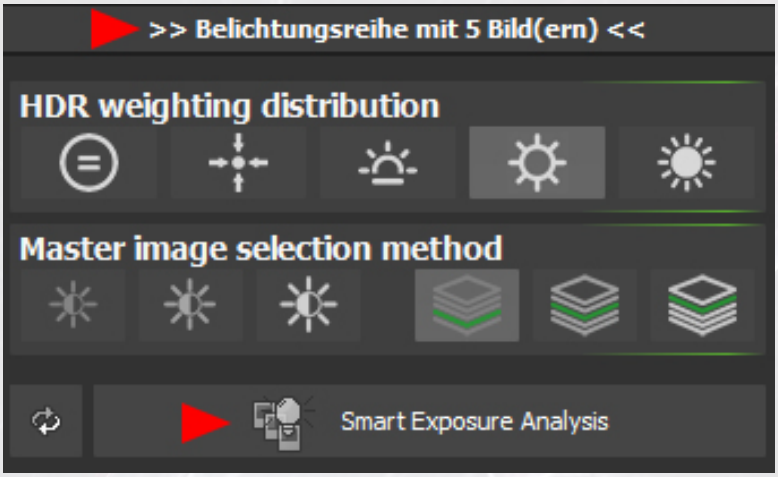
The master image is automatically defined by the software.

This automatically defined master image is the image that is one image brighter than the optimum exposure (**3**). In the example with 5 images, **the master image is the 4th image.**

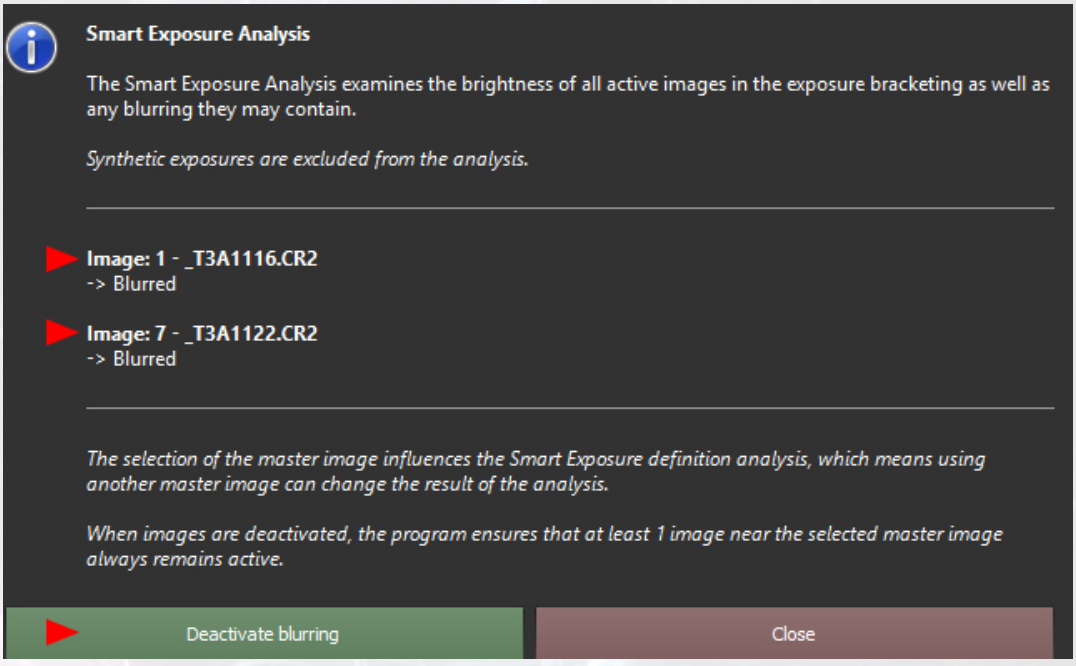
If you want to 'override' the automatic selection procedure manually, you have a total of 6 options, whereby the 3 options on the left are based on the **optimum light** and the 3 on the right determine the **position of the master image** according to the number of images (e.g. the centre button always takes the centre image):

1. Darker tendency: **One image darker than the optimum exposure**.
2. **Optimum exposure.**
3. **Standard setting: One image brighter than the optimum exposure.**
4. **The master image is below (darker) the centre image** (in 2nd place for 5 images).
5. **The master image is in the centre** (3rd position with 5 images).
6. **The master image is above (brighter) the centre image** (in 4th position with 5 images).

Smart Exposure Analysis



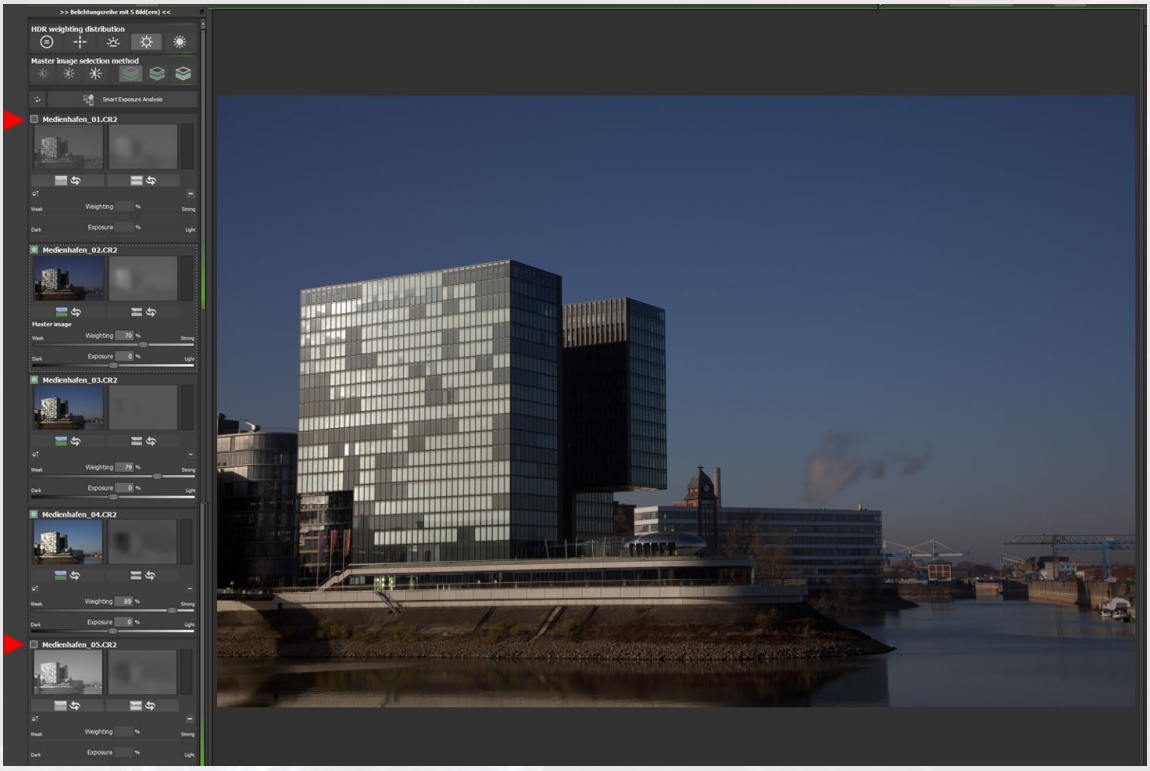
If you have loaded an exposure series, in the example the series with 5 images from the previous page, this module will analyse all active images by clicking on the button, in relation to any blurring or abnormalities in brightness, e.g. if an image is extremely underexposed or overexposed.



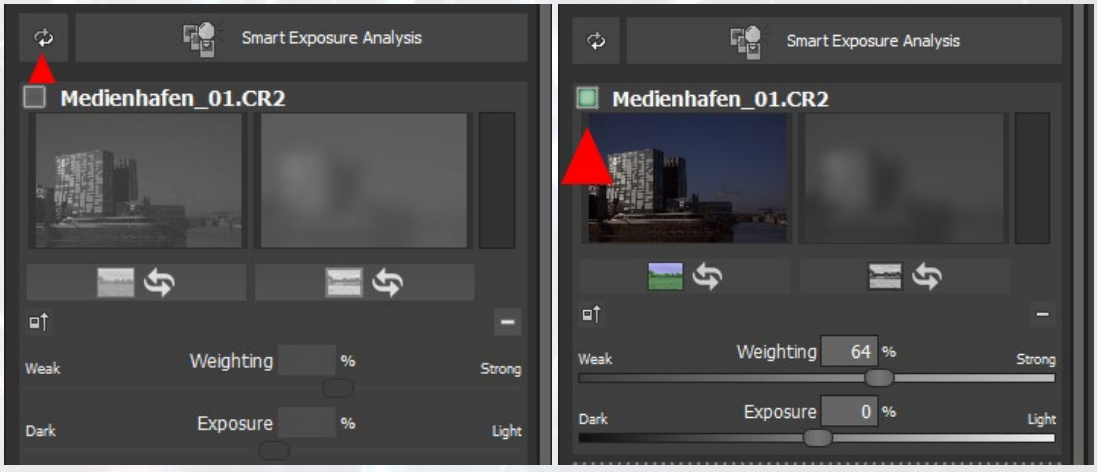
Click on the **Smart Exposure Analysis** button to display the analysis window. This analysis prioritises the master image and, depending on this, shows that image 1 is blurred and image 5 is slightly blurred in the sequence example. By clicking on the 'Deactivate blur' button, this image is deactivated and is no longer included in the subsequent calculations.

Tip: It is best to bracket exposures using different **time settings**, e.g. from 1/1000 sec. to 1/30 sec. with the **same aperture setting**. If you select different apertures, the variation in depth of field can also lead to blurring in the bracketing.

The blurred images are automatically deactivated.



Clicking the button **Deactivate blurring** does not delete both analysed images, but excludes them from the calculation. The small green button is now greyed out.
If required, you can reactivate the only slightly blurred image, for example.

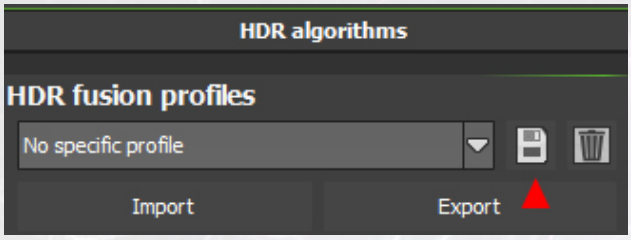


Reset results: Click on the button with the surrounding arrows to reset the results and reactivate all images (graphic on the right).

It is always worth taking a look at the analysis, especially when taking hand-held shots or video sequences, because you can quickly recognise anomalies such as blurring or individual images that are too bright or too dark and react
Synthetic, i.e. additionally generated images, are not taken into account in the analysis.

Right: HDR algorithms, options, ghost image correction

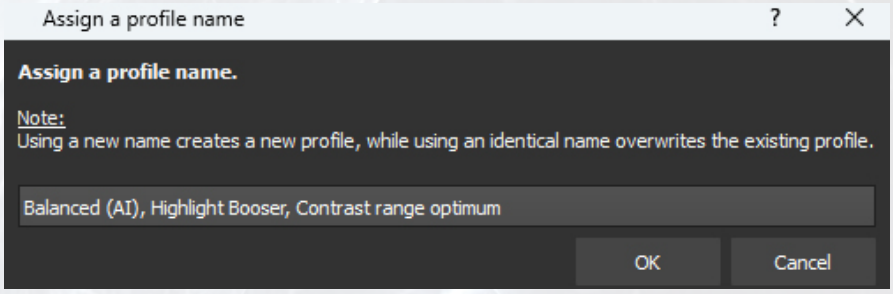
HDR fusion profiles



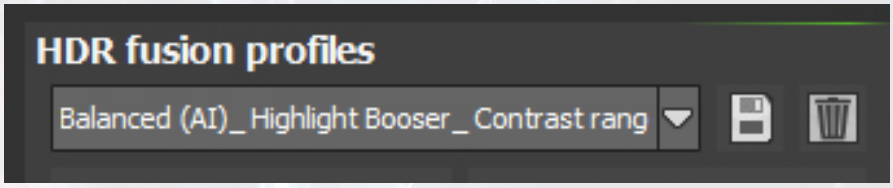
HDR fusion profiles contain all data of the active HDR fusion settings, e.g. settings of all **HDR algorithms, fusion method, scenario, fusion stacking, automatic subject brilliance, ghost image correction** if it is activated, **contrast range** if it is changed.

Create an individual profile: As a rule, the standard settings are so well adapted to the different exposure series that they can simply be adopted with the standard setting **no specific profile**.

If, in special cases, you have found a combination of an algorithm (e.g. **Balanced (AI)**) and individual control settings such as **Highlight Booster** and **Contrast Range Optimal**, which may also be useful for other image sequences, click on the **Save the current algorithm settings as a new profile**, ...

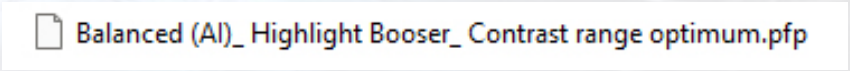


... assign a 'descriptive name' in the dialogue window that then opens and confirm the entries with OK.



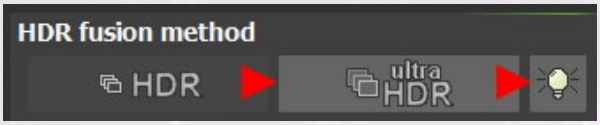
In future, you can call up this profile in the same way as all other profiles.

Click on the **recycle bin icon** to delete the profile you have called up.



Export/Import: Click on the **Export button** to save a profile in a selected folder as a **pfp file**, e.g. to make it accessible to other users and import it at a later time in the same folder by clicking on Import.

HDR fusion method: HDR, ultra HDR, Highlight Booster



HDR activates the 32 bit fusion and corresponds to the fusion of the input images.

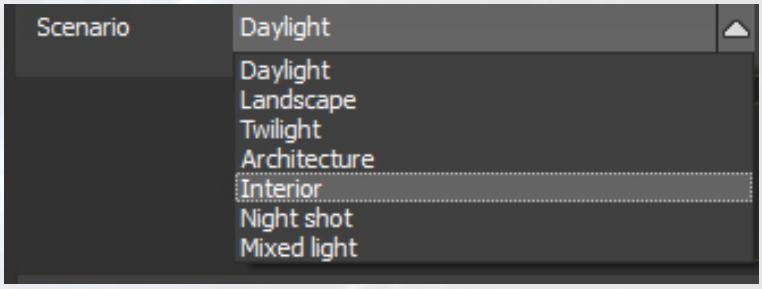
Ultra-HDR technology for the fusion of exposure bracketing images: **Ultra-HDR, which is set as standard**, calculates up to 30 intermediate images **between two photos with an accuracy of 64 bits**.

Highlight Booster: The **Highlight Booster in the 64 bit ultra HDR fusion** is also switched on as standard. The result of these two fusion methods is impressive and shows impressive images with maximum detail and better results in critical areas (e.g. when photographing into direct backlight).

If you switch off the Highlight Booster by clicking on the button with the lamp symbol, the result is still **very convincing** (diagram on the left), but the Highlight Booster makes a visible difference (diagram on the right).

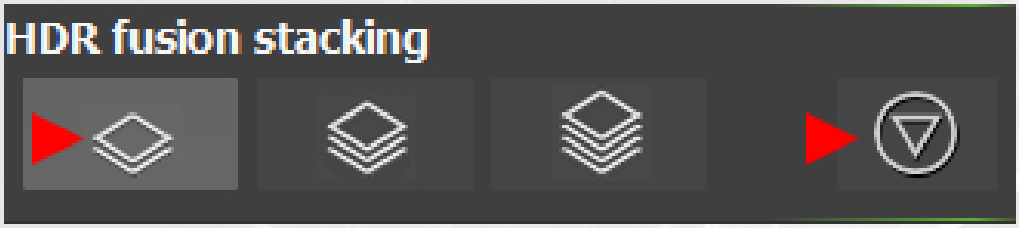
This module is identical to the one in **finalise mode**.

Szenario



If required, the HDR fusions can be influenced with **scenarios**.
If you want your results customised to specific lighting situations, **choose from the scenarios on offer here.**

HDR fusion stacking



HDR fusion is the general technique for overlaying images.

The innovative Fusion Stacking technology ensures halo-free images and optimised pre-sharpening.

In the first 3 buttons, different variants are calculated from the current **Entropy** setting with a certain smoothing, which are **all superimposed (stacked)**. This makes the image more homogeneous at the cost of increased calculation times of up to 8 times in the 3rd level.

By clicking on the button to the right of the 3 stages of fusion stacking, you activate a special sharpening algorithm that makes the HDR image slightly but visibly sharper, an **HDR-optimised pre-sharpening that slightly emphasises the contours in the image**.
The result is a more homogeneous and almost halo-free image.

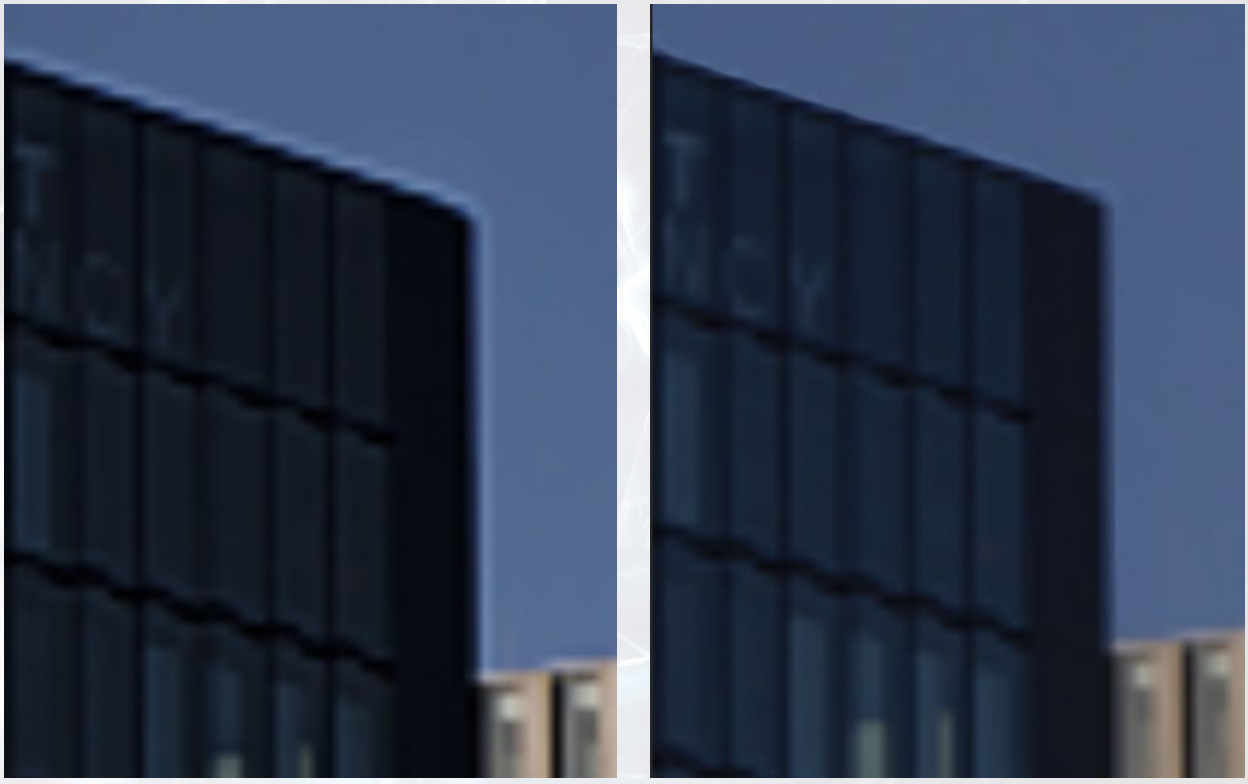
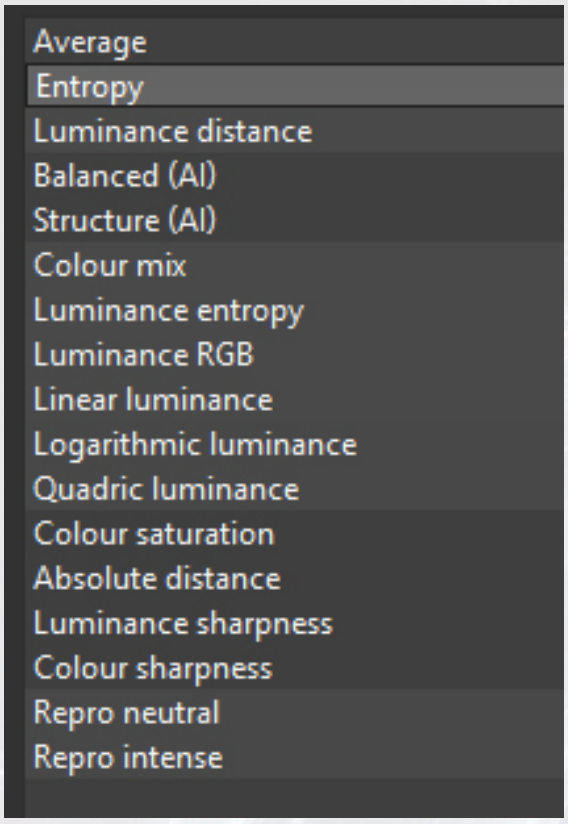
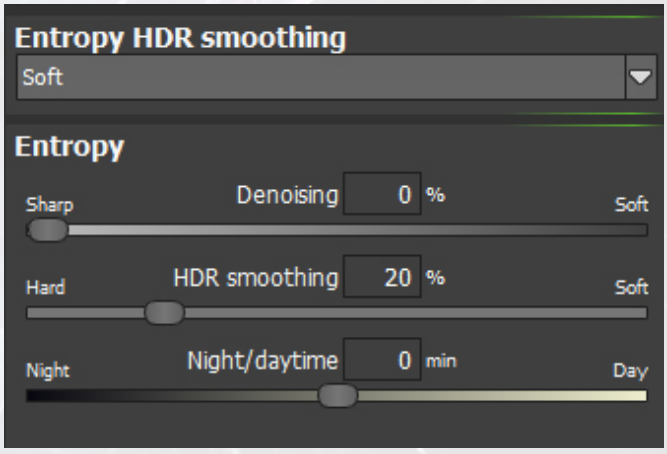


Image example: In the high magnification when the first level is selected by default, the halos can be clearly seen at the transitions between the building and the sky (diagram on the left). After switching on the 3rd level, the halos have disappeared.

Algorithms





An HDR algorithm is a mathematical rule that defines the weights (see weighting view in the exposure bracketing) of the individual exposure bracketing images per pixel. Each algorithm has a different effect on the resulting HDR image and has different strengths depending on the subject.
The corresponding parameters for an active algorithm are displayed below.

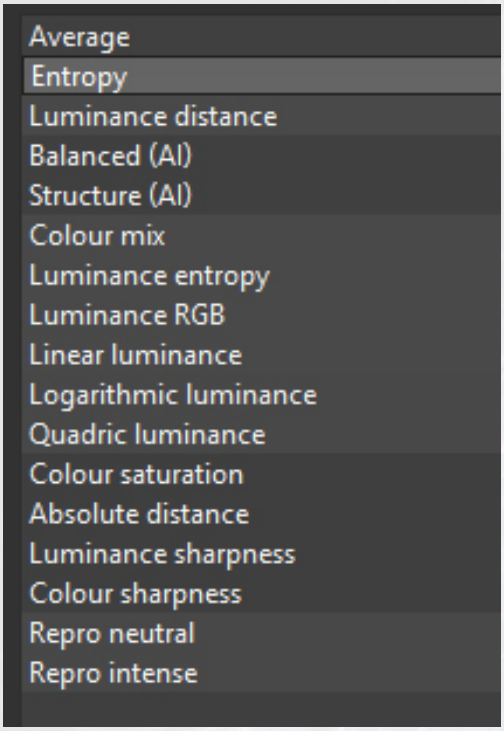
Average: The average is the simplest form of HDR generation and forms the mean value from the exposure bracketing images.

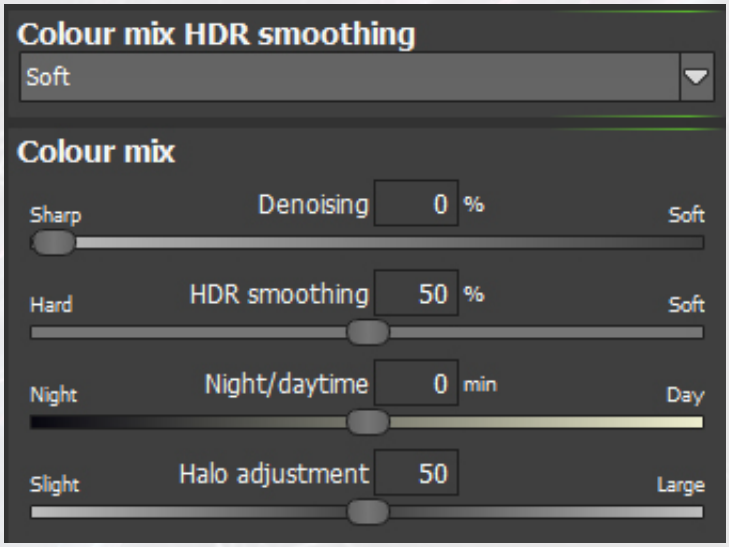
Entropy: This algorithm measures the information density of the exposure bracketing images per pixel and converts it into weights for HDR generation. **The result is a very stable process** and is **preset as standard**.

Luminance distance: Evaluates the individual image areas of the exposure series according to the average luminance distance to the current pixel. This method also offers the option of **halo adjustment**.

Balanced (AI): This fusion process determines the weighting with the help of artificial intelligence. **The underlying deep learning network was trained with balanced exposure series from all areas**.

Structure (KI): The same fusion process as for Balanced **(AI), the training focus here is on exposure series with** particularly strong structures.





Colour mix: The colour mix method uses the colour components of the pixels as a measure for weighting and is particularly suitable for exposure series with a small difference in brightness in partial areas, such as **fog, smoke or cloud images**.

Luminance entropy: Luminance entropy is the combination of **luminance distance** and **entropy** in a combined method.

Luminance RGB: The Luminance RGB process combines the **luminance distance** and the **colour mix** into a new process and is particularly suitable for **landscape photography**.

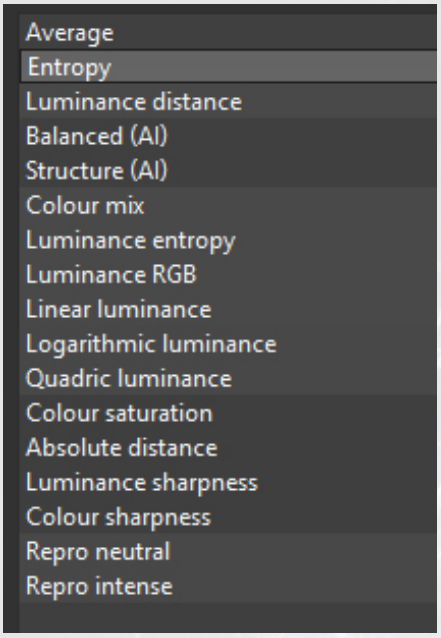
Linear luminance: Linear luminance uses the luminance (brightness) directly to weight the pixels.

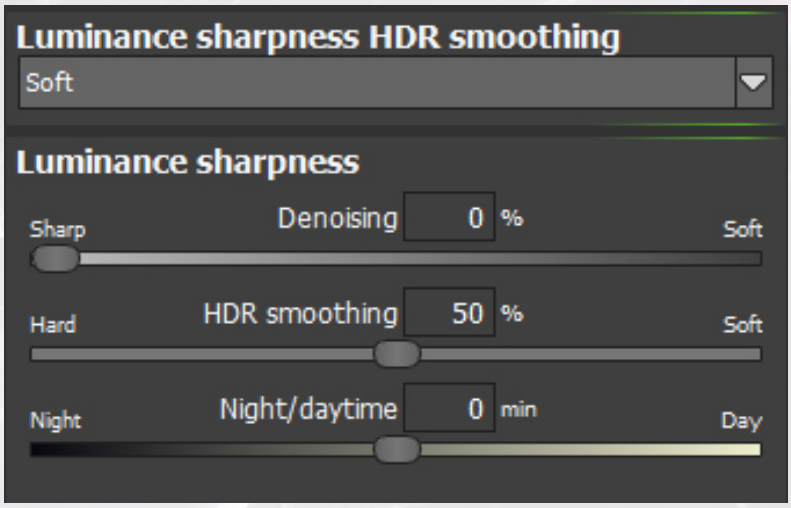
Logarithmic luminance: This algorithm works with the logarithmic brightness (luminance). This corresponds approximately to the brightness perception of the human eye. **This makes this algorithm very suitable for most exposure series**.

Quadric luminance: This algorithm works with the fourth power of brightness and is therefore very suitable for processing **bright exposure brackets**.

Colour saturation: This algorithm calculates the weighting from the colours of the individual images and is therefore particularly suitable for **exposure series with high colour contrast**.

Absolute distance: A very effective fusion process that combines two essential properties: When **HDR smoothing is deactivated**, the **HDR images are practically free of halos** and, in addition, brightness breaks are avoided.





Luminance sharpness: With the luminance sharpness method, the ambient sharpness of the brightness is converted into a weighting. In this way, the areas with very good detail are obtained. This method is well suited for **very intense HDR images**.

Colour sharpness: The colour sharpness method determines the weighting from the ambient sharpness of the brightness and is very well suited **for colourful, intensive exposure series**.

Repro neutral: This HDR process is specially optimised for exposure series of **scanned photo data** with normal lighting situations.

Repro intensive: The Repro intensive HDR process is designed for scanned image material of reduced quality, such as **old slide scans**. The fusion of the images is carried out much more intensively here.

Further parameters for adjusting the HDR algorithms

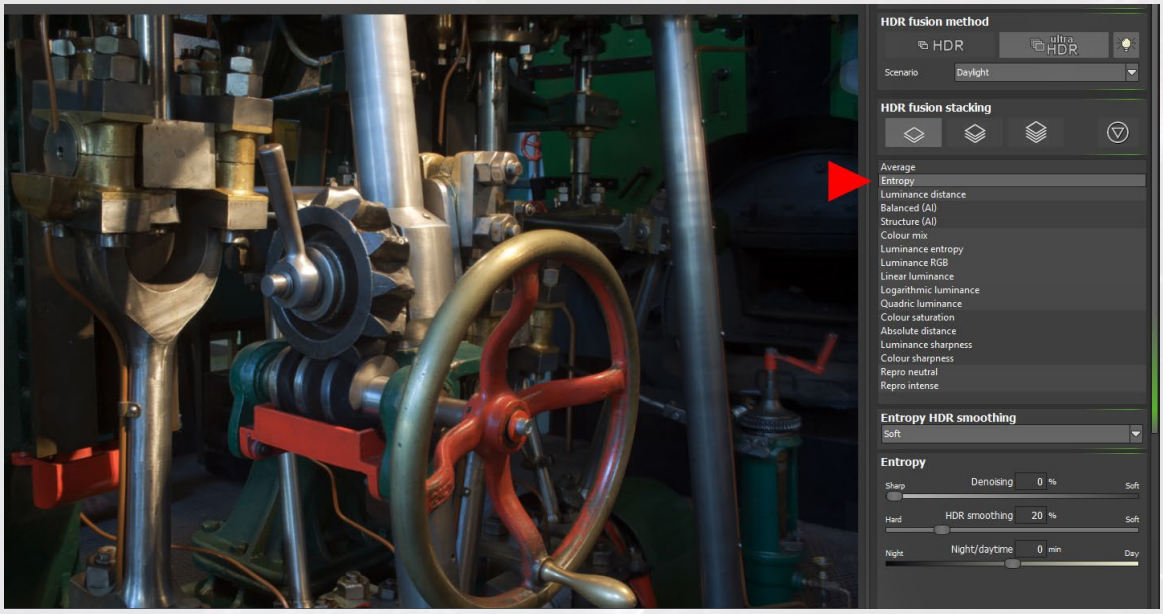
Below the selection list for the HDR algorithms, the sliders belonging to an algorithm are displayed for fine adjustment (graphic on the right):

Denoising: The denoising has a direct effect on the HDR image and specifies the denoising strength as a percentage. A value of 0% means that no noise pixels are removed, a high value denoises the HDR image very strongly and causes a slight loss of sharpness.

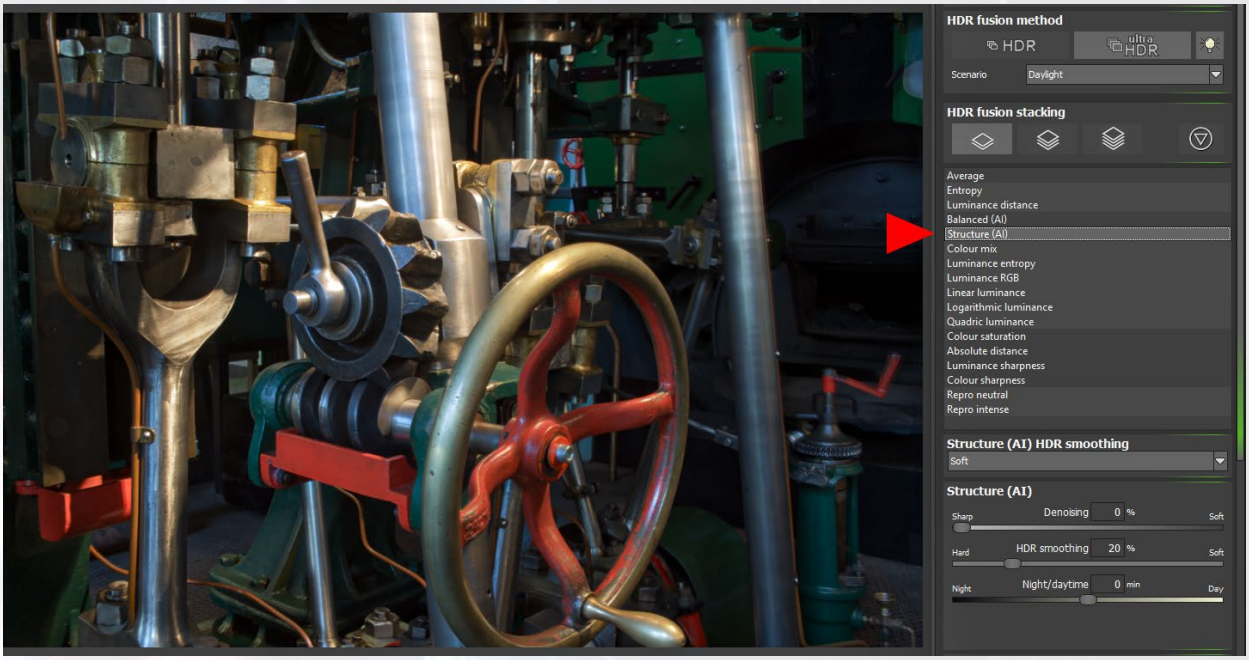
HDR smoothing: Smoothing acts directly on the weighting matrices and specifies the level of smoothing as a percentage of the image resolution.

Day & night slider: This slider adjusts the HDR algorithm to a day or night shot. For a night scene, the slider is moved to the left (night), for a shot with predominantly daylight to the right (day). However, you can also deliberately swap the settings and change the picture mood.

Example of an algorithm comparison **entropy** to **structure (AI)**



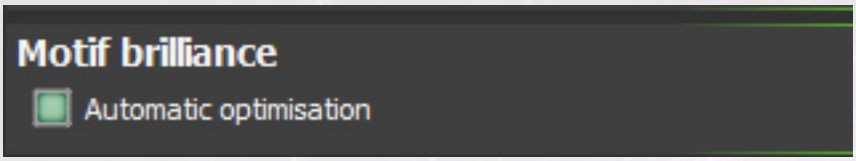
In the descriptions of the algorithms, compare the **respective emphasised focal points or strengths** for different motifs, simply try out the algorithms that you think offer an even better solution for your personal perception.
In the image example, the comparison of the default choice **Entropy** ...



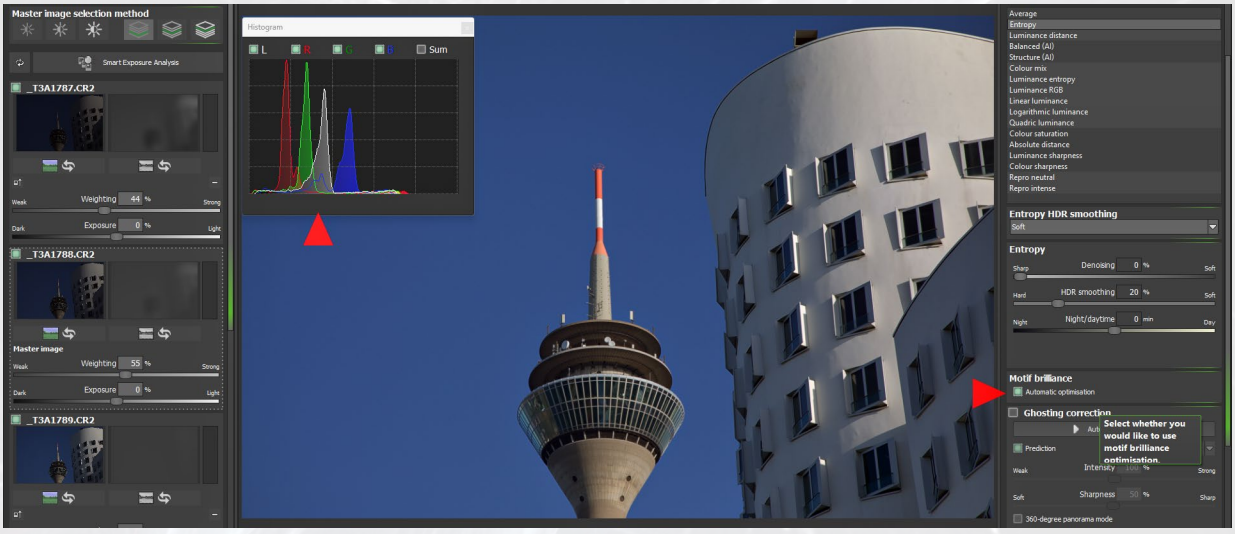
... to **structure (AI)**, for example, that this algorithm effectively emphasises the image character of industrial motifs with pronounced structures and many details, emphasising the existing structures and making them appear sharper.

Note: The HDR fusion profiles, algorithms, various processes and scenarios are adopted synchronously in post-processing in finalise mode when changes are made and can also be influenced there subsequently if required.

Motif brilliance



The optimisation of **Motif brilliance** activates intelligent tone value spreading and is preset by default. It can be deactivated by clicking on the green button.



The comparison shows the standard **active Motif brilliance** ...

... to the **deactivated Motif brilliance**. The fusion image is darker and appears paler. The histogram displayed in each case visualises the difference in the tonal value spread.

Contrast range

The contrast range of an HDR image is - mathematically speaking - the division of the brightest image brightness, e.g. directly in the sun, and the darkest point in the image, i.e. in shadow areas.

In this module, you can influence the preset, unaltered contrast range as required.

Compression: This indicates how strong the compression of the HDR image brightness is compared to a non-manipulated HDR image, in this case **0%** because no changes have been made.

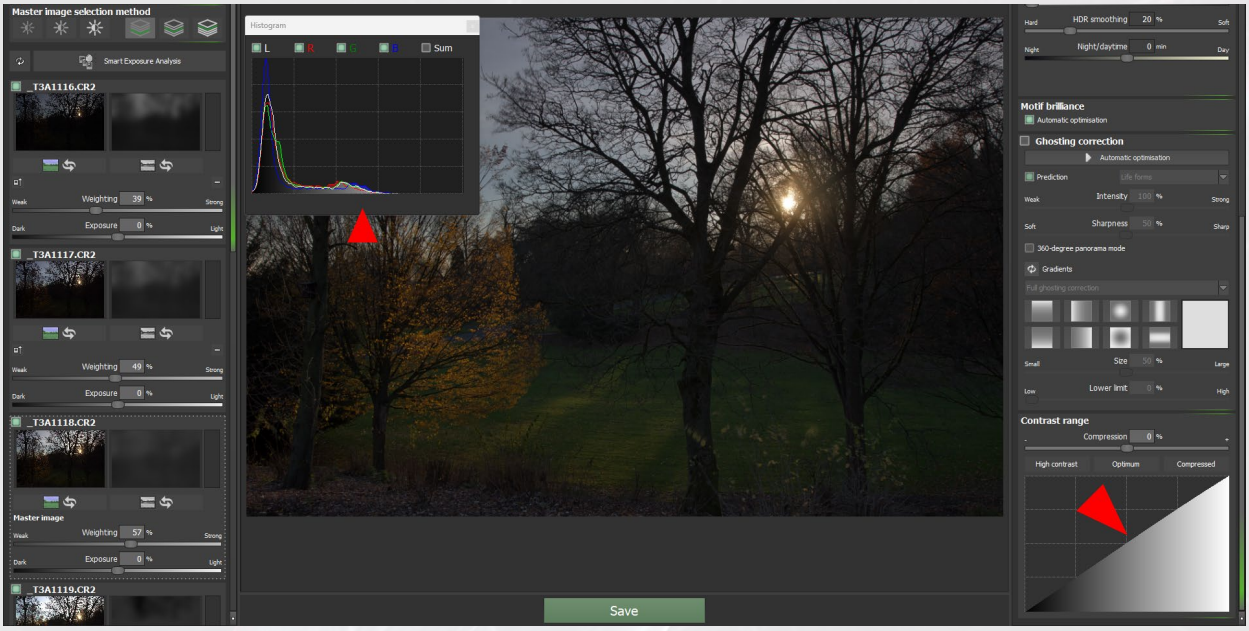
High contrast: Creates a high-contrast HDR image with a high dynamic range, i.e. **very deep shadows** and **very bright highlights**. The image has **more depth**.

Optimum: Creates a balanced HDR image.

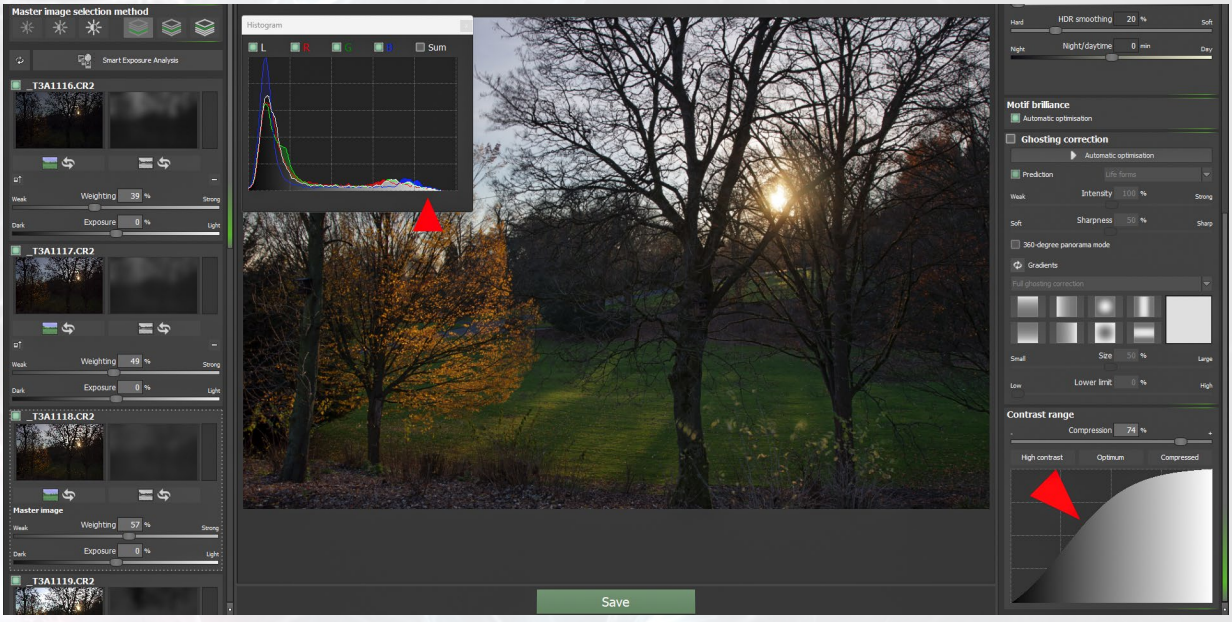
Compressed: Creates an HDR image with a **lower contrast** range and reduces the dynamic range. This can be useful for very high-contrast exposure series in order to brighten up dark areas of the image and make some additional details visible in the tone mapping.

As soon as you select one of the automatic modes, you can follow live in the programme how the best value for the current HDR image is searched for. Below the automatic optimisation buttons, the **curve display** visualises how the brightness values of the HDR image are adjusted by the program in the contrast range optimisation.

Picture example



All standard settings have been used in this HDR fusion image, including the contrast range.



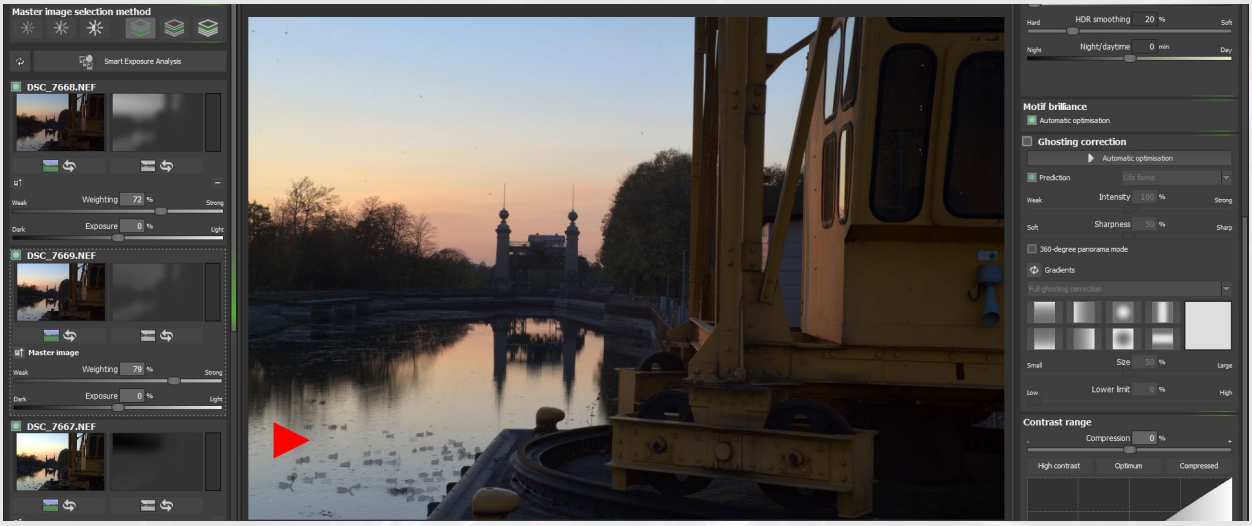
By clicking on one of the three options, the image is analysed and can, for example, lead to a better result in the HDR fusion when **optimising**.

In the image example**, Compressed** was selected with the desired result that the dark shadow areas are significantly brightened after the analysis.

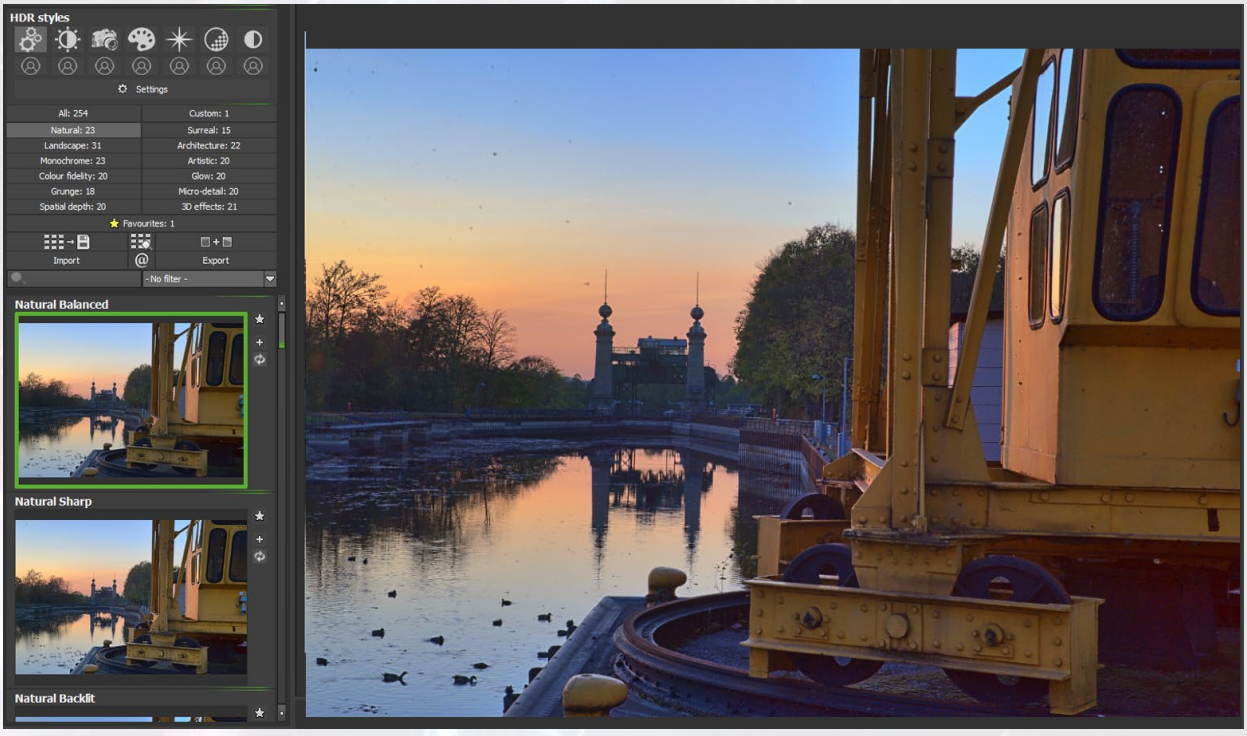
The changed curve view, the displayed compression value of 74% and the clearly stretched histogram confirm the image impression.

Note: Like all changes made in the **Edit bracketing module**, all manipulations you make here will affect the resulting image in **post-processing** with **tone mapping.**

Ghosting correction

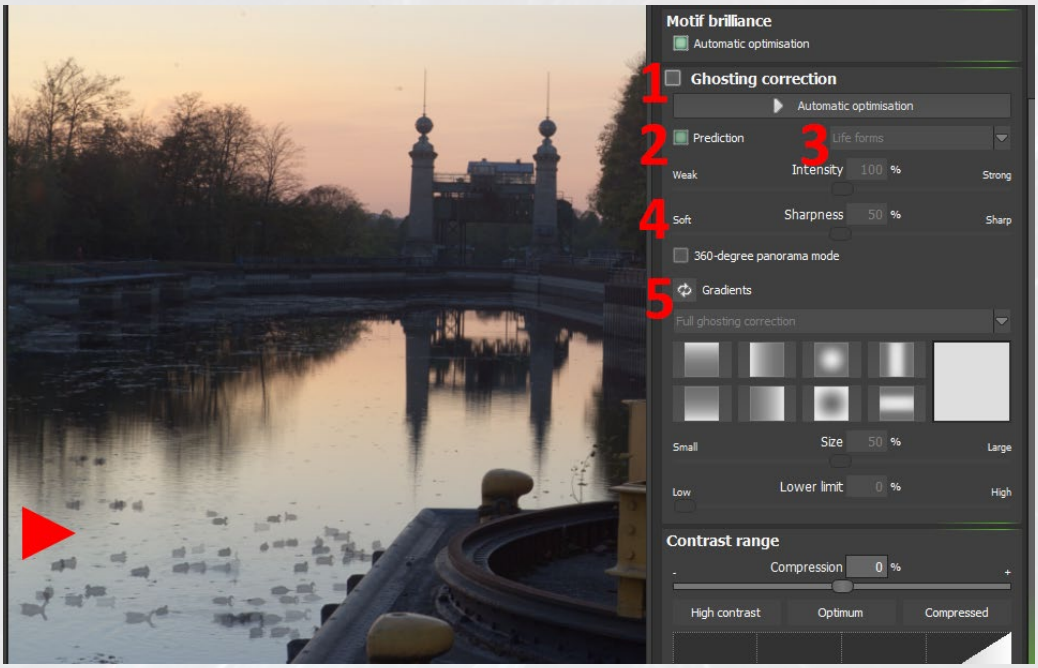


When bracketing exposures, it is always worth checking for ghost images and correcting them, especially if the ghost images are as obvious as in this example with the ducks, which of course did not remain still during the 5 shots.



Result image in post-processing after automatic ghosting correction: HDR has a very precise automatic ghosting correction function that filters out moving objects that move within the exposure series, i.e. that appear in different places in the individual images. Without correction, these people, animals or vehicles, for example, would appear semi-transparent several times in the resulting image, as they move and are in a different place with each exposure.

The comprehensive module offers numerous individual fine adjustments or variations in addition to the automatic function:



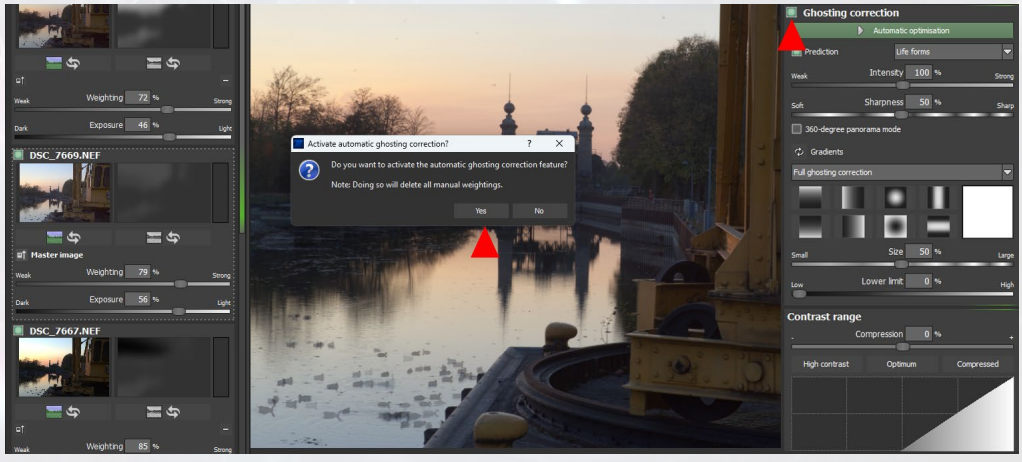
1. **Activate, deactivate automatic**.

2. **Forecast**: Detailed forecast with extendet Ghosting correction.

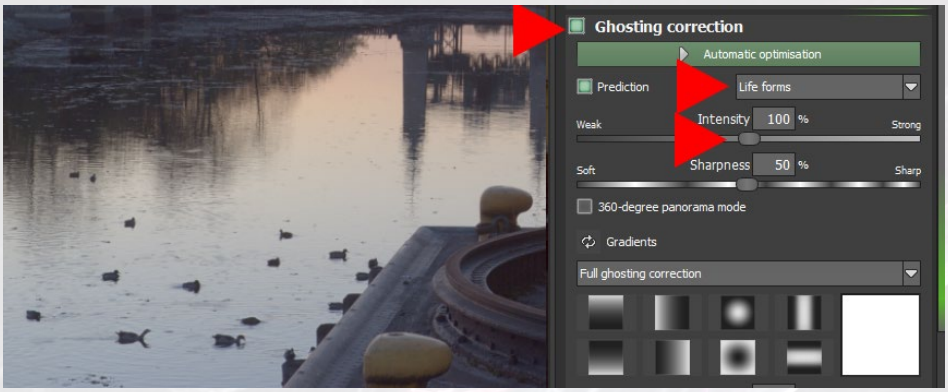
3. **Motif-specific method for Ghosting correction.**

4. Parameter for the **Intensity** and **Sharpness** of the automatic Ghosting correction.

5. **Gradients** with selection of gradients, default settings and parameters for the Size and Lower limit of the gradients.

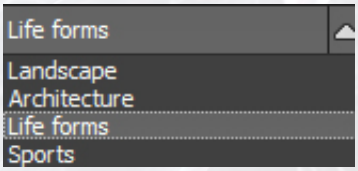


Activate automatic: Click on the grey box in front of the **Ghosting correction** button to turn it green and display a message that all manually changed weightings will be deleted by clicking on **YES**. Confirm this.



The very good result image without ghost images is displayed immediately.

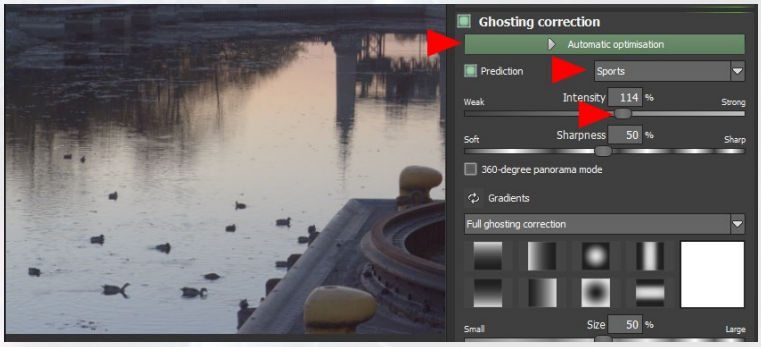
Forecast: The **detail forecast** activated by default recognises significantly more moving objects within the exposure series and is more computationally intensive.



After activating the automatic ghost image correction, **the Motif-specific method** for the calculation is set to **Life forms**.

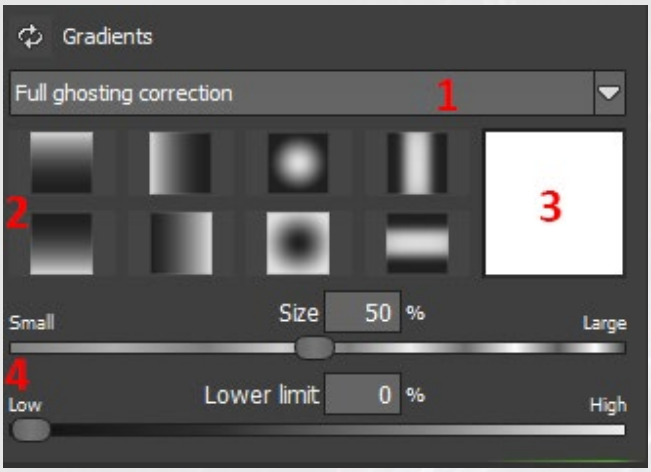
Intensity parameter: With this very effective parameter, which is set to an average value of **100%**, the **intensity of the Ghosting correction** can be adjusted to the left to 0%, where it has a very weak effect, and to the right to 200% to the maximum value if required.

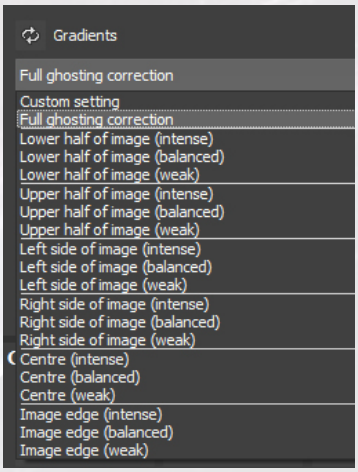
Sharpness parameter: This slider, which is set to the middle value of **50%**, determines how **sharp edges must be** in order to be recognised as a ghost image. If the value is high, the detected ghost image areas are smoothed to a lesser extent.



Automatic optimisation: If you want to try out whether the result can look even better when removing the ‘ghost ducks’, activate a more complex calculation by clicking on **Automatic optimisation** with the result that the intensity slider is now set to **114%** and the Motif-specific method for the calculation is set to **Sport**. The result depends on the exposure bracketing and is only more convincing here if you look closely. This optimisation can be triggered several times by clicking the button.

Gradients





Gradients are a very effective way of limiting **Ghosting correction locally** or **excluding certain areas** of the image that should not be corrected.
The gradients can be combined with each other.
The options offered allow for completely individualised limitations or exclusions:

1. **Selectable presets for the gradients** with the default preset **Full ghosting correction** - i.e. no restriction.
   Click on the button or the small arrow next to it to display all the options (graphic on the right). By clicking on a desired gradient, it is immediately applied to the exposure series.

2. **Directly selectable gradients**: Clicking on a desired gradient immediately applies it to the exposure bracketing.
   White means: The ghost image correction is fully effective here and is slowly faded out towards grey and black and becomes ineffective.
   Black means: The ghost image correction has no effect at all and is slowly faded in towards grey and white.

3. **Visualisation of the progressions:** In this window, the progression or the combination of several progressions is displayed as a greyscale image.

4. **Size** and **lower limit** parameters: The size slider can be used to adjust the **size of the gradient**, while the **lower limit slider** can be used to vary the lower limit of the gradient if required: The default value of 0% confirms the 'normal' gradient from white (full ghost correction) to black (minimum correction). If the value is set to 50%, the black that is being excluded becomes a grey and means that the selected gradient does not hide everything even with black.

   Click on the surrounding arrows to **delete the selected gradients**.

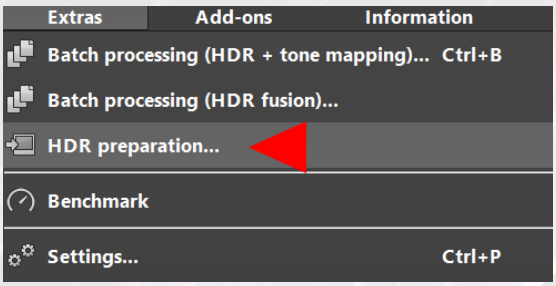
Example 1: Gradient from top to bottom: In this example, the correction has no effect in the lower part of the image (black) and is faded in smoothly towards the centre, where it has a 100% effect on the moving clouds (white). The preview window on the right visualises the progression.

Example 2: Progression from the centre upwards and downwards: In this exposure series with 9 images (graphic without ghost image correction), in which the clouds, branches and leaves of the trees have moved, the ghost image correction should only affect the centre of the image with the more pronounced cloud structure.

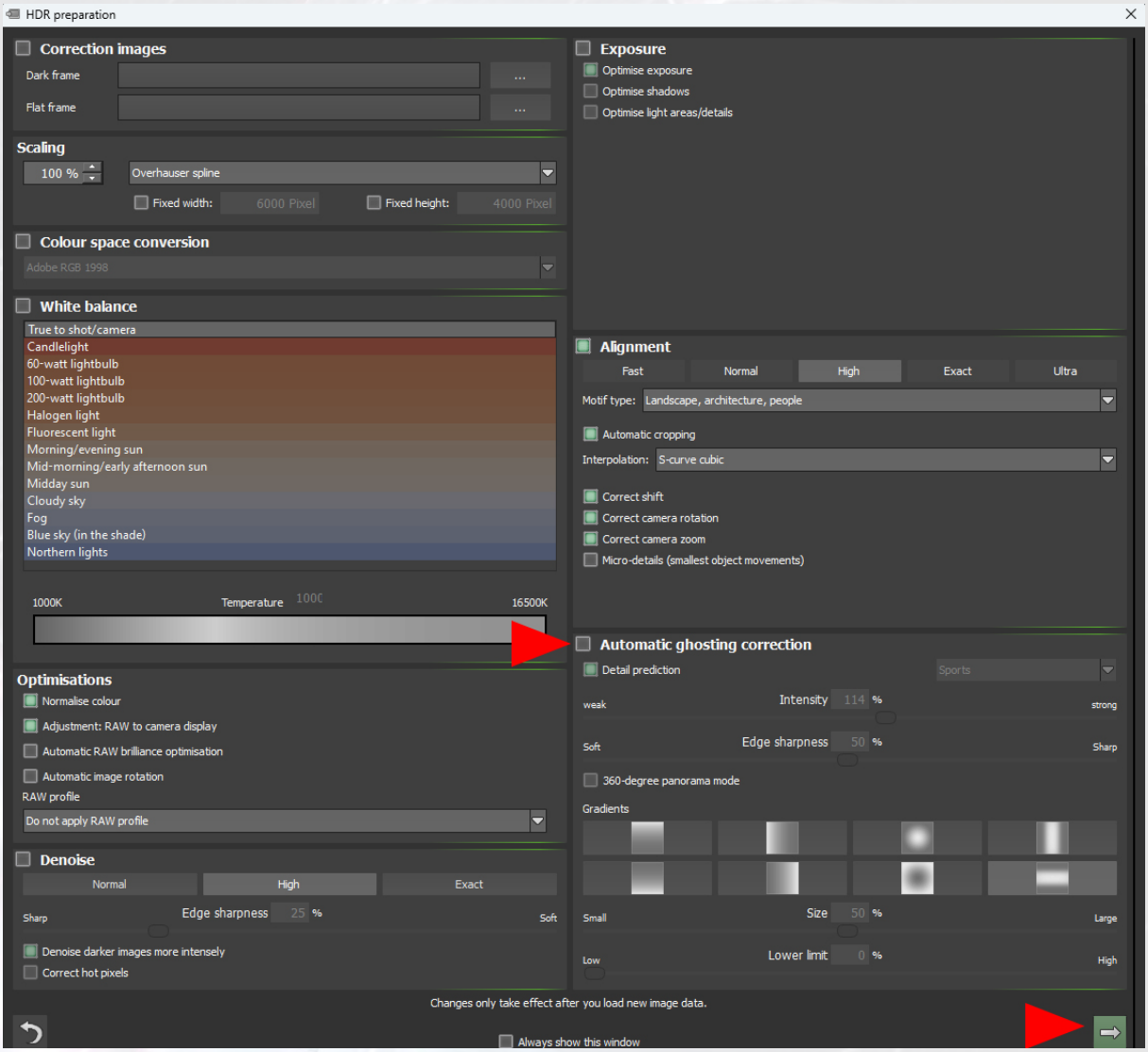
The selected gradient after activating the correction produces the desired result: the upper sky area and the lower image area with the trees appear blurred, the centre of the image appears sharper and with more structure.

Always activate automatic

After closing the programme, the **automatic ghosting correction** is deactivated and must be reactivated manually after a restart if required.

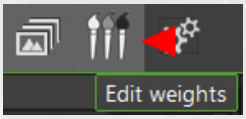


If the ghosting correction is to be **switched on by default**, this is easily possible. Click on the submenu **Extras/HDR preparation** ...

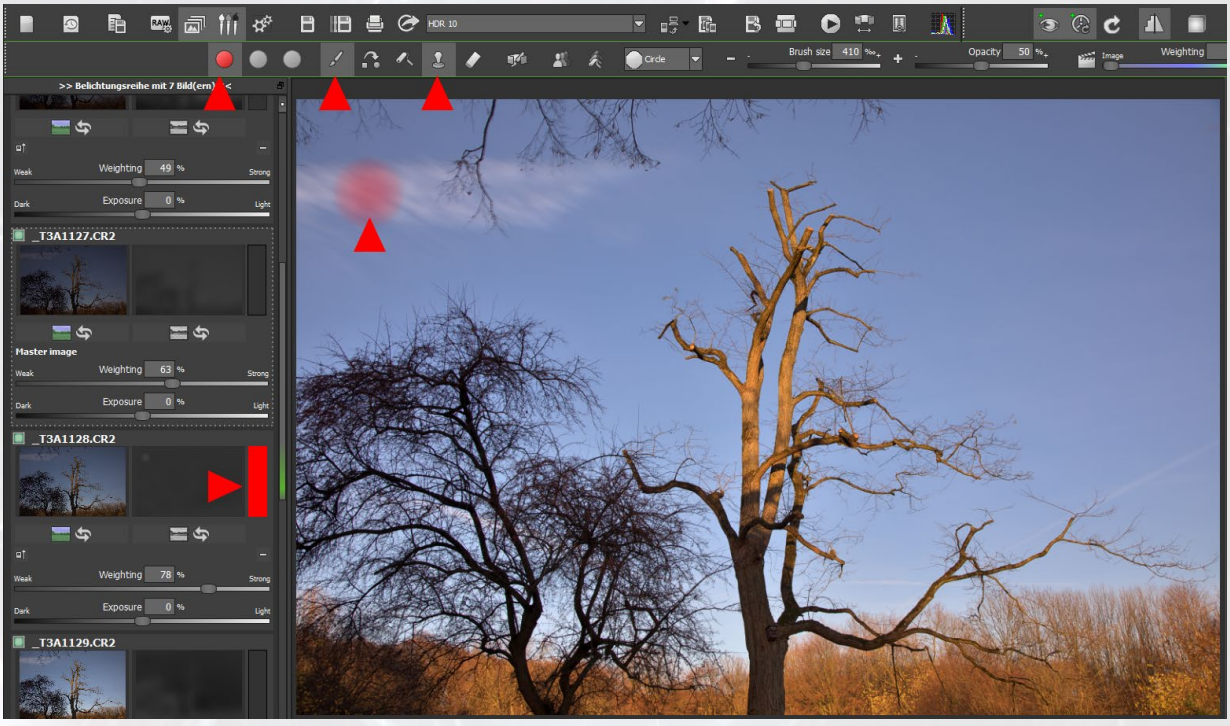


... the **HDR preparation** window opens. Click in the grey box in front of **Automatic ghosting correction** to turn it green and activate automatic ghost image correction. Click again on the button with the **green arrow** to apply the changed setting.

Edit weights



The **Edit weights module** with its tools is very well suited for manually editing a series of exposures or a video sequence over the individual images of the series in order to change selective image areas.
These can be **ghost images** where, for example, 'wandering' clouds at a certain position are to be adopted for the entire series or people/animals are to be fixed at a desired position in a single image.
However, the options of this module are not limited to these applications. For example, the **brightness of parts of a selected image** can also be 'frozen' and used for the HDR fusion.



The procedure is the same in all cases and can be realised in just a few steps:

Step 1: Select the individual image where, for example, the desired cloud image or the desired brightness of selected parts of the image are to be applied.

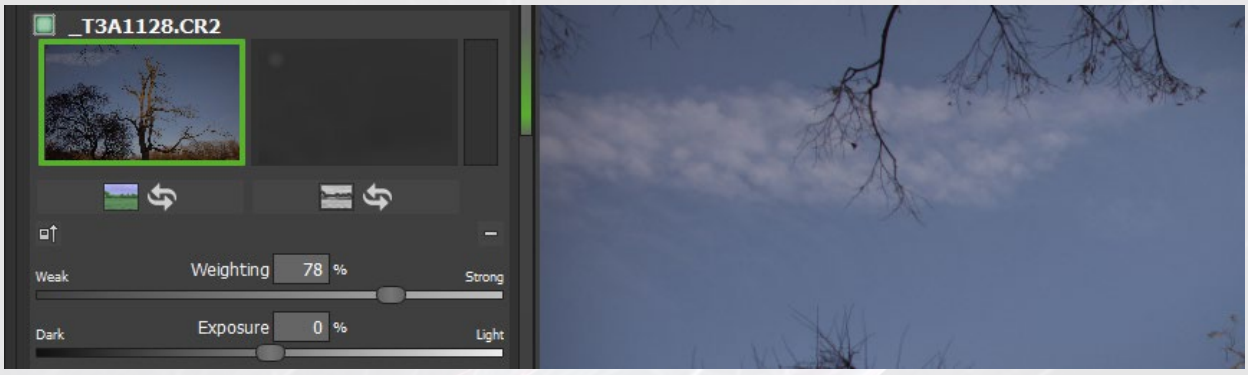
Step 2: Click on the button next to the mask to automatically set the weighting **colour RED** (reference colour) for the drawing mode.

Step 3: Select combination of **brush** (increase weight) and **stamping mode**.

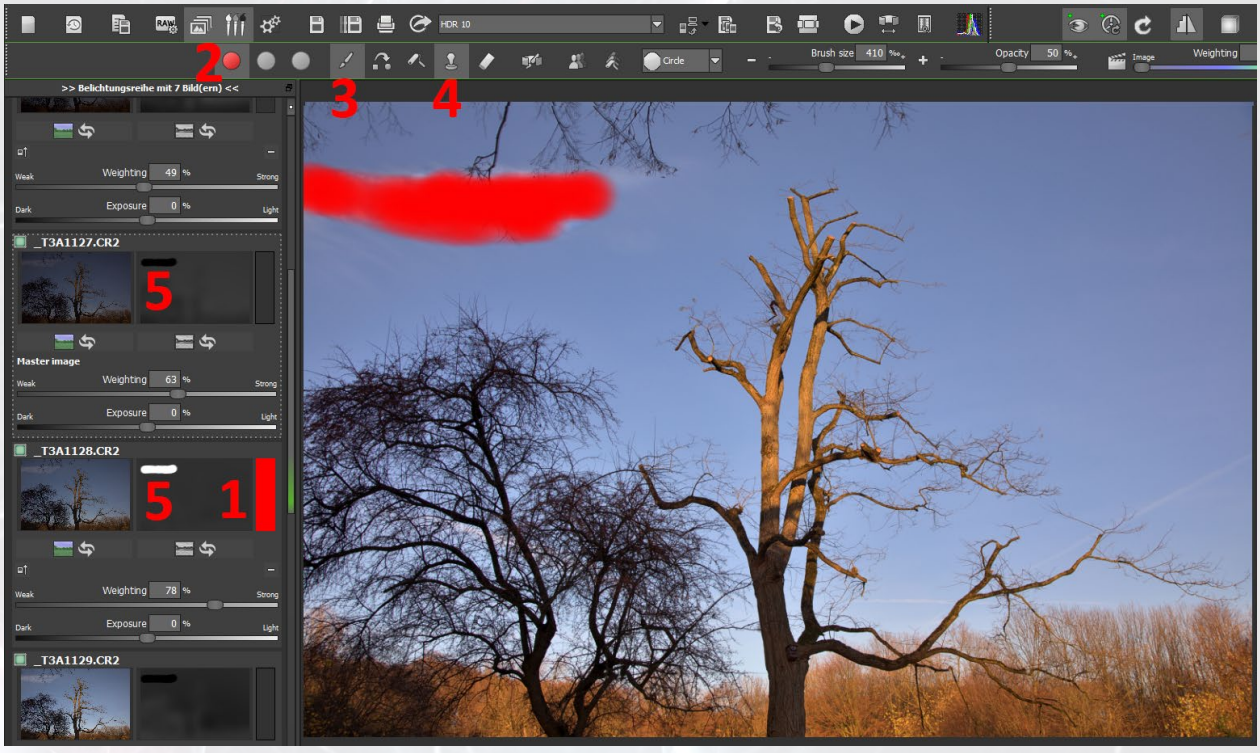
Step 4: If necessary, adjust the **brightness of the fixed area** - done!

This quick and simple procedure covers most cases.
The following detailed image examples show the various possibilities.

Use cloud image of a single image for exposure bracketing



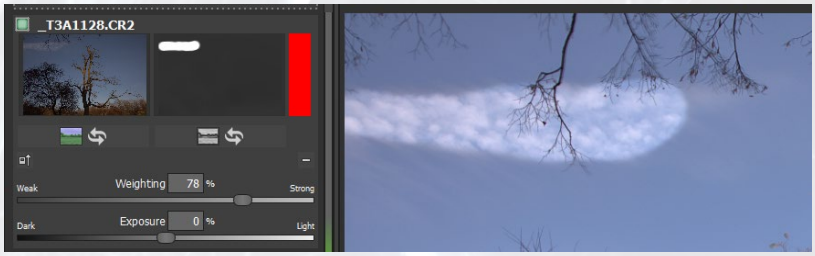
Step 1: Selecting the individual image: Scroll through the exposure series and decide on the image in which you would like to see the clouds in the resulting image. The brightness is not decisive because it can be corrected later.



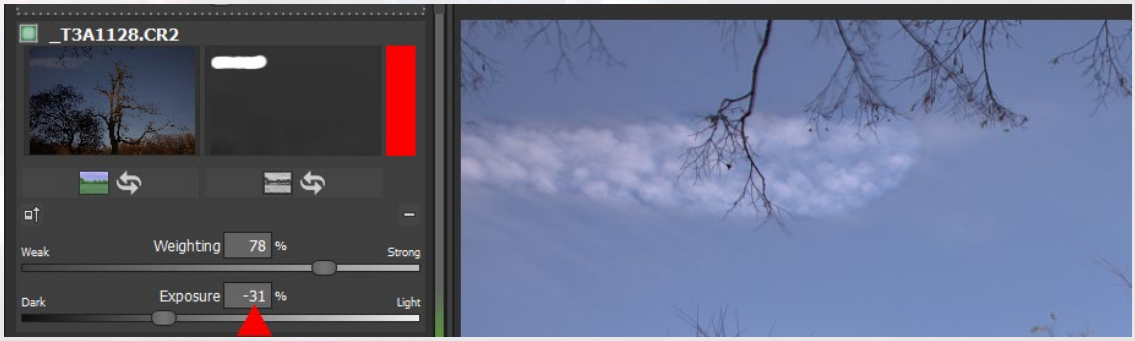
Step 2: Click on the button to the right of the matrix (mask) to automatically display the **red weighting colour** (**1**). At the same time, in the now **active toolbar**, which is presented in more detail later, the greyed weighting matrix changes to the **colour red** (**2**) and indicates that it is active.

Step 3: Select a combination of **brush** that increases the weights (**3**) and **stamping mode** (**4**): **The brush/increase weight** is used to paint over the areas from the selected single image, in the image example the clouds.
The **stamping mode** ensures that the weights of the overpainted areas are **reduced for all other images**, the overpainted area dominates and is thus applied to all images in an exposure series or video sequence.

Visualisation of overpainting and stamping: The white colour in the mask of the selected individual image indicates that the weighting has been increased to the maximum at this point by overpainting. The corresponding areas in **all other individual images** are **black** due to the punching and visualise that the weighting has been reduced to such an extent that it no longer plays a role in the resulting image.



Step 4: If necessary, **adjust the brightness of the fixed area**: If you release the mouse button with the brush, the result becomes visible. In the example, the clouds are too bright compared to the surroundings. However, this is not a problem:



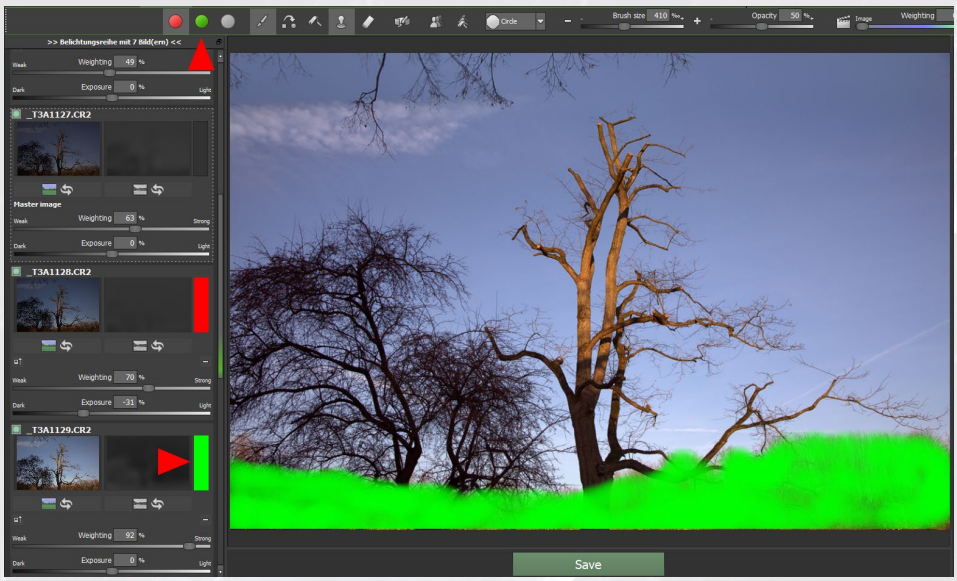
Drag the **exposure slider**, which now only affects the overpainted areas, gradually to the left until the brightness of the clouds and the sky ‘fit’.

Before - After - Comparison

The initial image with the ‘wandering’ clouds, which present themselves in a blurred, somewhat transparent grey, is created with a few quick manual interventions …

… to a resulting image with a clearly visible and structured cloud image at the desired location.

Manually darken/brighten parts of the image



When adjusting the brightness of the clouds to the surroundings, the **exposure control** has solved the problem.

If you want to darken entire parts of the image, such as the bushes, to make them stand out even more in the resulting image, it is just as easy: Select a single image from the exposure series that you consider to have the 'right' exposure and click on the button next to the matrix to select the **2nd weighting colour**, which is automatically assigned as **green**.

It is important that the green button in the toolbar is activated by clicking on it.

The following steps are identical to those for cloud editing: you activate the **brush** and **stamping mode**, paint over the desired parts of the image, in the example the bushes ...

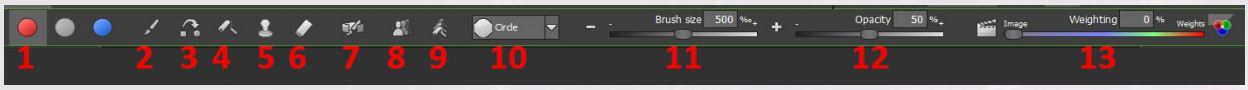
... and see the desired HDR fusion image after releasing the mouse button.

Before - After - Comparison

The familiar initial image ...

... compared to the interventions in the **Edit weights module**: In the first step, a single image was fixed with a desired cloud position, in the second step the bushes in the lower part of the image were darkened with another single image. The result is convincing overall and in all parts of the image.

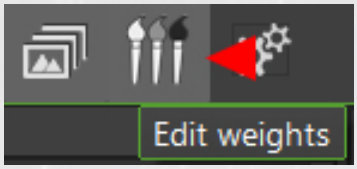
Toolbar



For most tasks, the previously used **brush** and **stamping tool** are sufficient. Additional tools are available for further options such as **deleting** one or all drawn weights, changing the **brush size** or **opacity**, which enable all desired adjustments or cancellations in the event of incorrect weights:

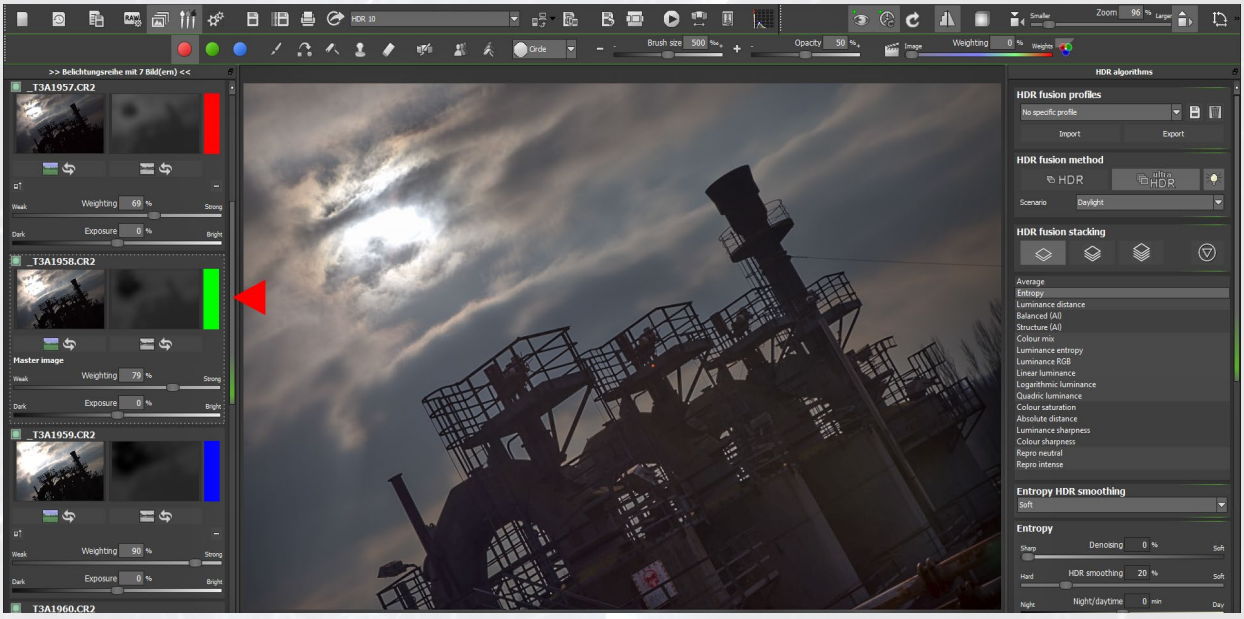
1. Activate the selected **weighting matrices**, in the example **red**.
2. **Increase brush/weights**: In conjunction with the **brush size** and **opacity** sliders, the brush can be quickly adjusted to the areas to be painted over.
3. **Blur** to **smooth** out weighted areas afterwards.
4. **Delete function**: After activating this tool, move the brush over the areas to be corrected or deleted. If the stamping mode is also activated, the deletion of the areas moved over affects **all images**, which is usually desired.
5. **Stamping mode**, which can be activated for the **brush** and the **blur tool**: If the mode is active, all images of the exposure bracket or video sequence are processed with the selected weighting colour, increased and reduced in all other images.
6. **Reduce weight**: This tool can be used to remove ghost image areas of a single image, for example. You will see these overpainted areas in black in the mask.
7. **Panorama drawing mode**: Calculates all drawing functions and automatic ghost correction with a 360-degree panorama adjustment.
8. **Delete weights, replace with automatic ghost image correction:** : Deletes all **overpainted areas** and replaces them with an Automatic Ghost Correction calculation. This allows you to apply the **Automatic ghosting correction to specific areas of the image**.
9. **Delete all weights**: Clicking this button deletes **all overpainted areas** and resets them to their respective initial values.
10. **Select an alternative brush shape**: Click on the button or the small arrow next to it to select different brush shapes that may be better suited to the areas to be painted over.
11. **Setting the brush size**: Use the slider to set the desired brush size.
12. **Setting the opacity**: Use the slider to set the desired opacity. By default, the value is set to 50%.
13. **Visualise weighting**: The slider can be used to fade in the painted-over areas less or more (to the right) if required.

Direct selection of the module



As a rule, after selecting a single image from the exposure series in the **Edit weights** module by clicking on the button next to the matrix, the **red colour** is automatically selected to activate the weighting matrix and the editing options are displayed.
If you select further individual images to manipulate image areas, the colours **green** and **blue** are assigned.

The direct choice of a module is different: Click on the button with the three brush symbols ...



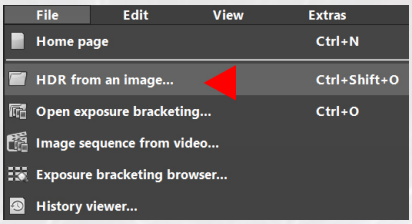
... the 'extended' exposure bracket with all options for the correction possibilities is displayed immediately.

The individual images in the exposure series are now automatically assigned the colours **red**, **green** and **blue**. If there are more than three individual images, as in the example with 7 images, **green is assigned to the master image** and **red** and **blue** to the next active neighbouring images.
If another active single image is selected, one of the 3 colours is automatically assigned to this image.

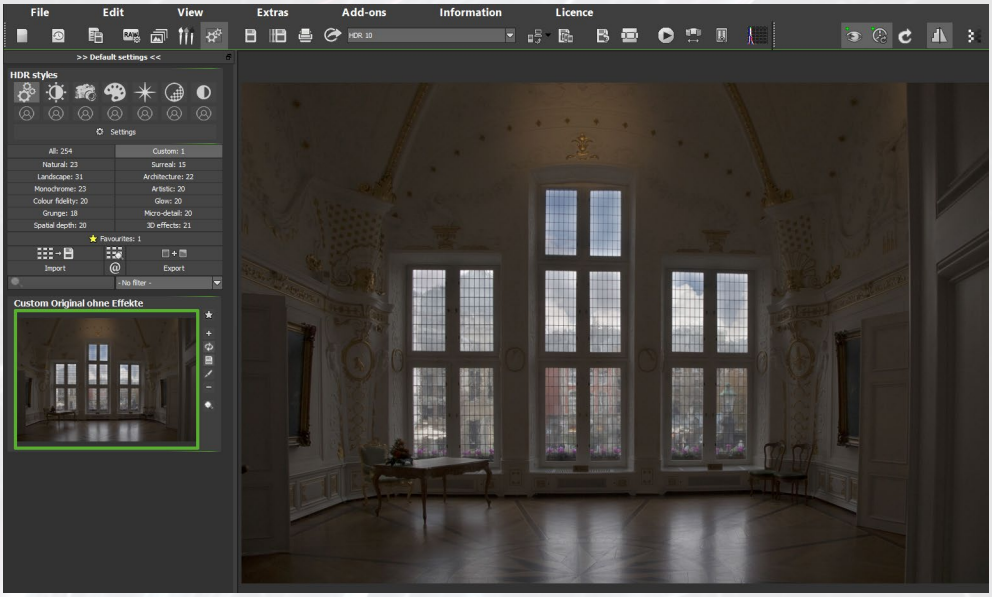
If you now want to make changes to the weighting of a specific image, **pay attention to the colour coding of the image** and select this colour in the toolbar before the desired tool selection.

The processing steps are identical to those described above.

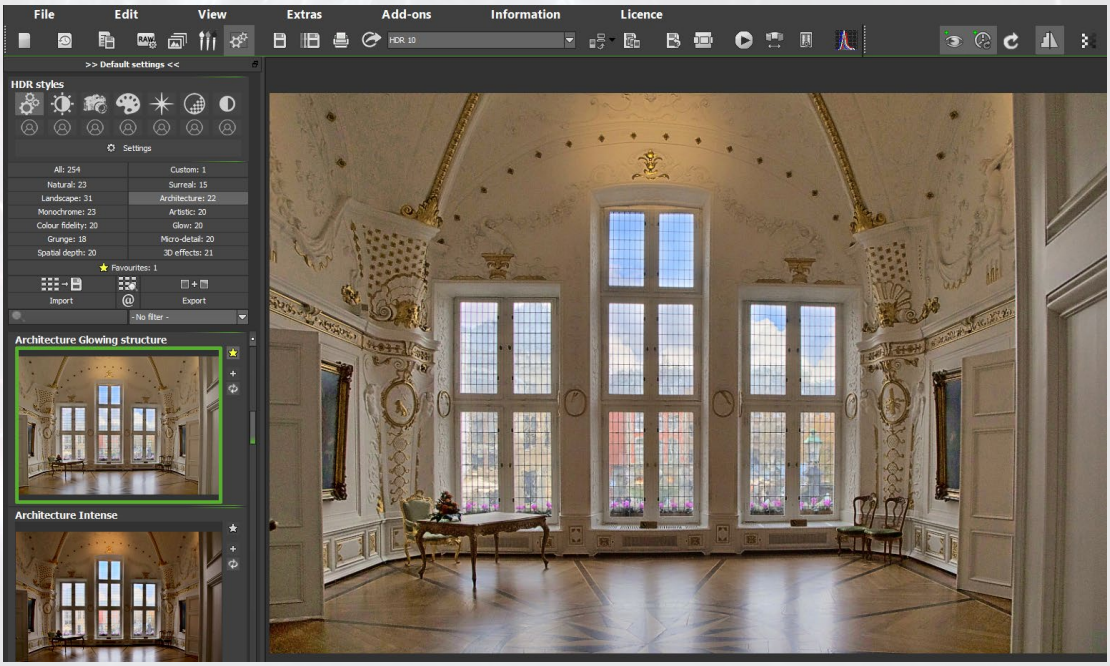
Create automatic exposure bracketing from single images



Of course, individual images can also be loaded in HDR, e.g. by clicking in HDR from an image in the file menu or via drag & drop. the programme offers a unique technology for this option, which is the normal case for many users, ...



... which can also be a 'normal single image or an image taken under difficult shooting conditions as in the image example ...

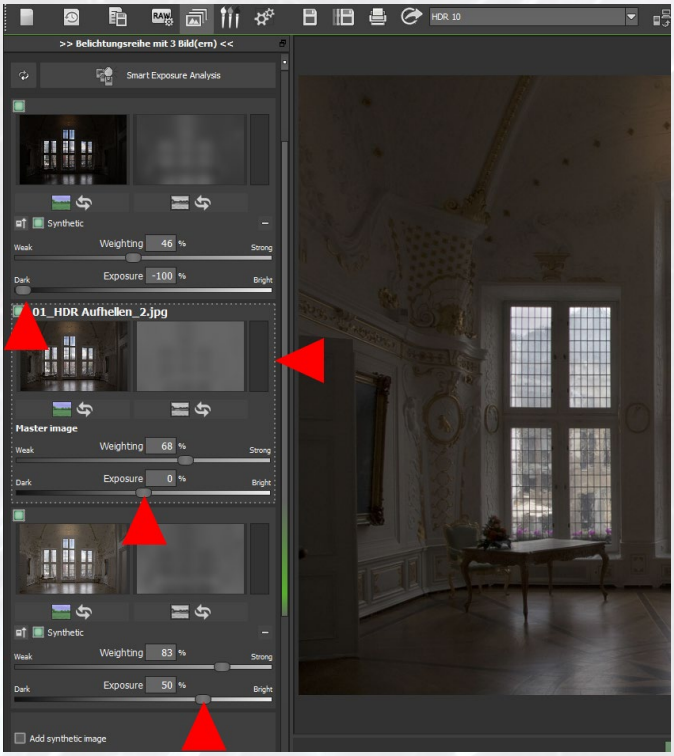


... into an extraordinary resulting image.

The secret behind this spectacular process is the interplay between an **artificially generated exposure bracketing**, the selected **HDR styles** and the **tone mapping** effect of the active preset.

Synthetic exposure bracketing

If you load a single image, **2 additional synthetic images are generated by default**.



You can easily see this after switching to the Edit bracketing module.
Starting from the exposure of the original, the **master image in the centre**, the image above is exposed **darker (- 1.0 EV**) and the image below is exposed **brighter (+ 1.0 EV**), i.e. the **dynamic range** is artificially extended.

Note: EV stands for **E**xposure **V**alue.
In practice, there are **2 definitions** for the EV value:

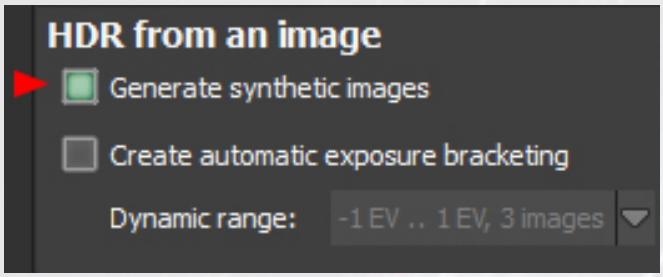
EV compensation in the camera: The **higher** the value compared to an initial value, the **brighter** the image becomes; the **lower** the value compared to the initial image, the **darker** the image becomes.

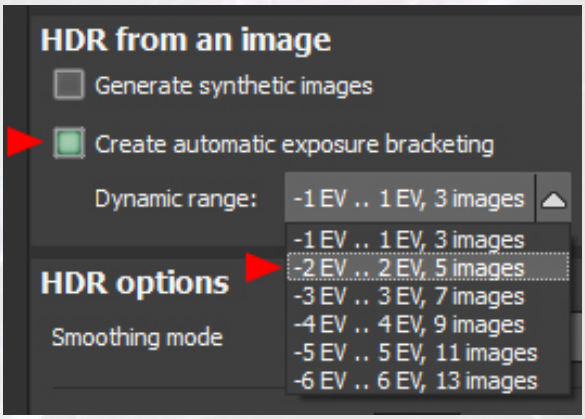
EV value in photography: The **opposite is true for aperture values**: If you reduce the aperture value, e.g. from **f/4.0** to **f/2.8**, the aperture becomes more open and the image **brighte**r; if you increase it from **f/4.0** to **f/5.6**, less light comes through and the image becomes **darker**.

The **dynamic range** is the maximum contrast that the camera sensor can distinguish from the darkest to the brightest point without the highlights being blown out or the shadows no longer having any definition.

Extend dynamic range further

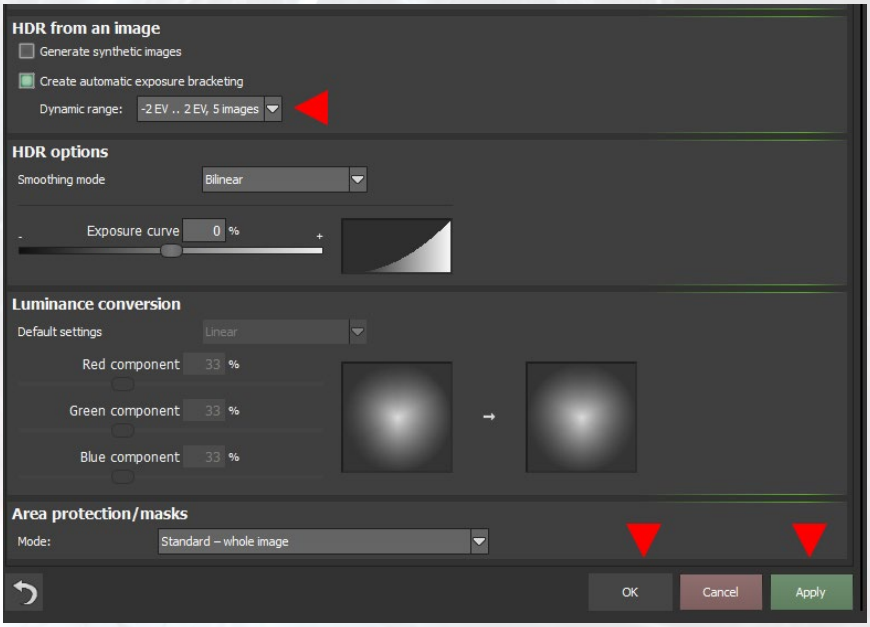
If you want to extend the automatically generated exposure bracketing even further for special subject situations, switch to the **Calculation** tab in the **Extras/Settings** menu.





Here you can change the default setting Create **synthetic images**, which adds 2 additional images to the original.

By clicking in the previously grey box in front of Create **automatic exposure bracketing**, it turns **green** (graphic on the right), and by clicking again in the button next to **Dynamic range** or the small arrow next to it, you can specify the number of images between 3 and 13, which in the latter case corresponds to a **dynamic range of - 6 EV to + 6 EV, i.e. 12**.



After selecting a new automatically generated exposure series, in the example **5 images with a dynamic range of - 2 EV to + 2 EV**, confirm the changed entries with **Apply** and **OK**.

This setting will remain for all single images until it is changed again here.

Artificial exposure bracketing with 5 single images

By converting a single image into an artificial exposure series, in the example with 4 additional images to the original, ...

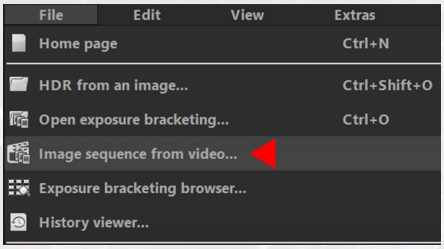
... turn 'normal' individual images into real eye-catchers in a flash.

Add synthetic image: If required, you can create and activate another image artificially by clicking in the grey box in front of **Add synthetic image**. This option is always located below the last image of an exposure series.

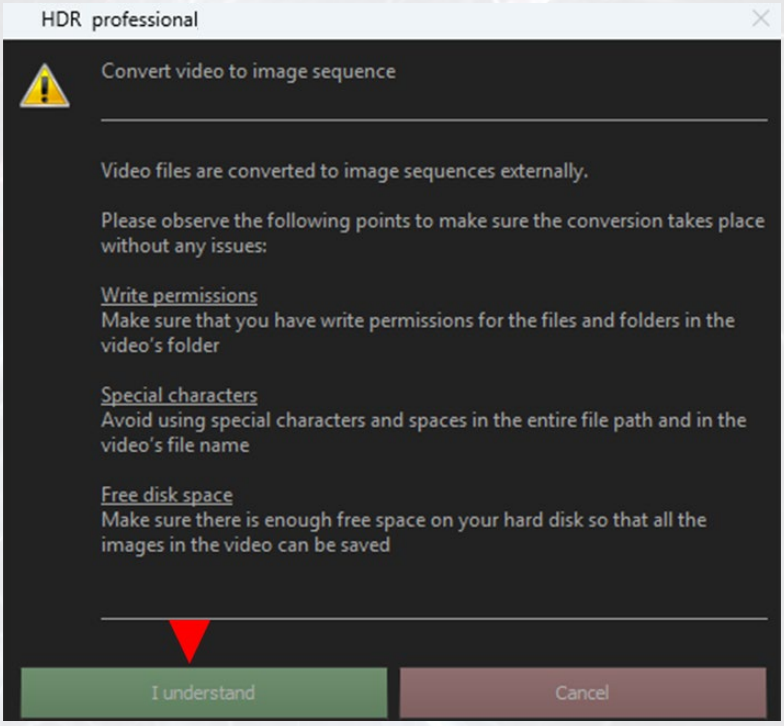
6. Load video sequences

With the exception of the file import with some queries, you edit a video sequence like an exposure series.

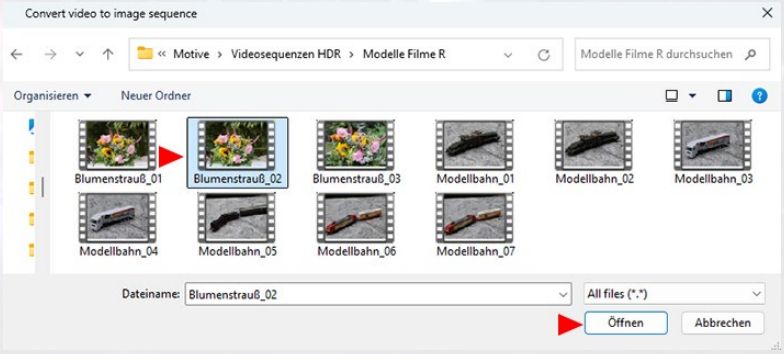
Load Image sequence from video



To load a video sequence or a film file, select **File/Image sequence from video**.

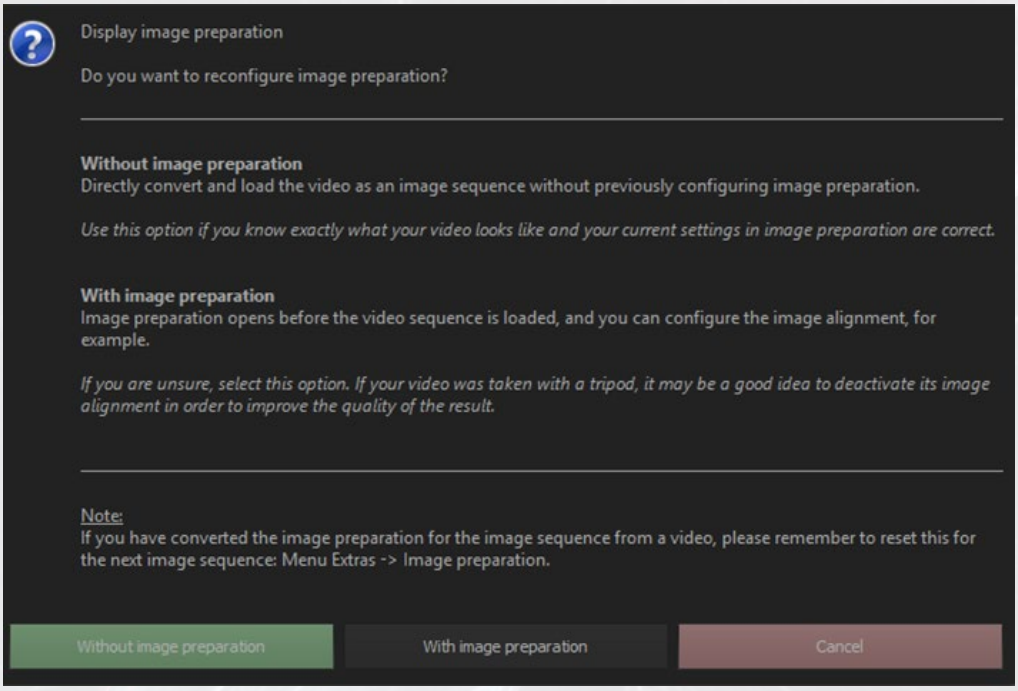


Various query windows will then open, which you can either confirm/cancel or in which you have to make decisions. In the top window, confirm the information by clicking on **I understand**.

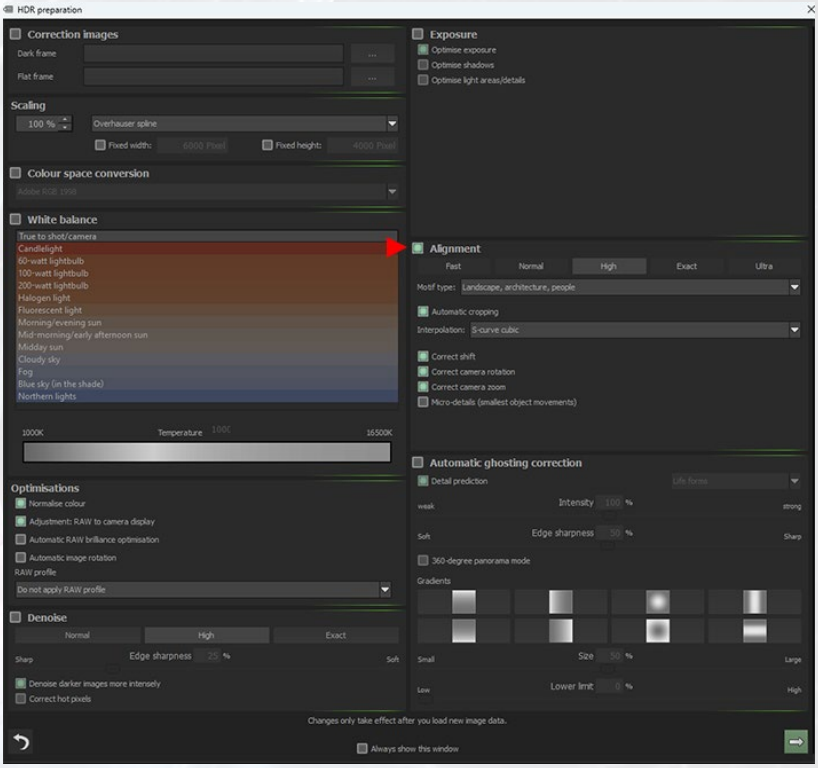


In the selected folder, select the desired video file and either **drag & drop** it into the work window as in the previous example or load it by clicking on **Open**.

Use HDR image preparation or select standard presets

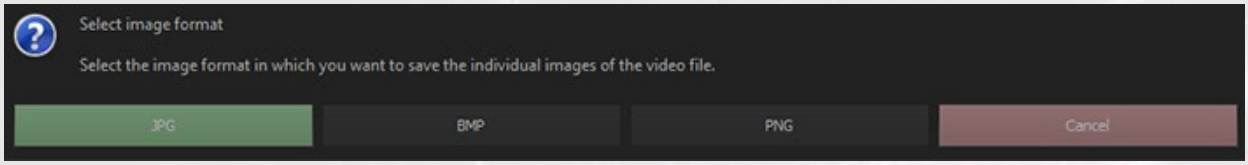


In this dialogue window, you can choose between the default **option without image preparation**, in which the video file is converted directly as an image sequence, or **with image preparation** ...

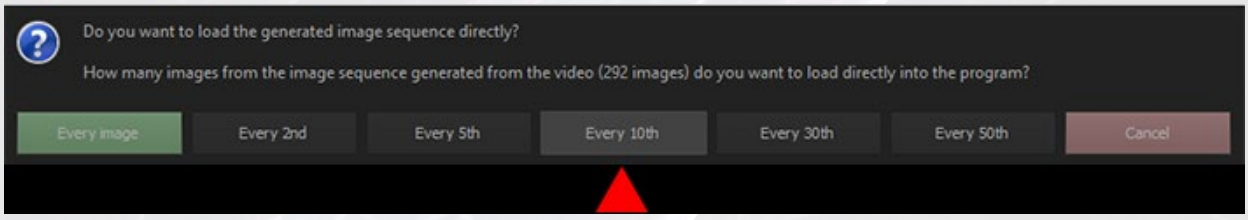


... and can **deactivate automatic alignment**, for example, in the **HDR preparation dialogue** window that then opens, which can also be called up at any time under **Extras/HDR preparation**. As a rule, click on the green button **without image preparation**.

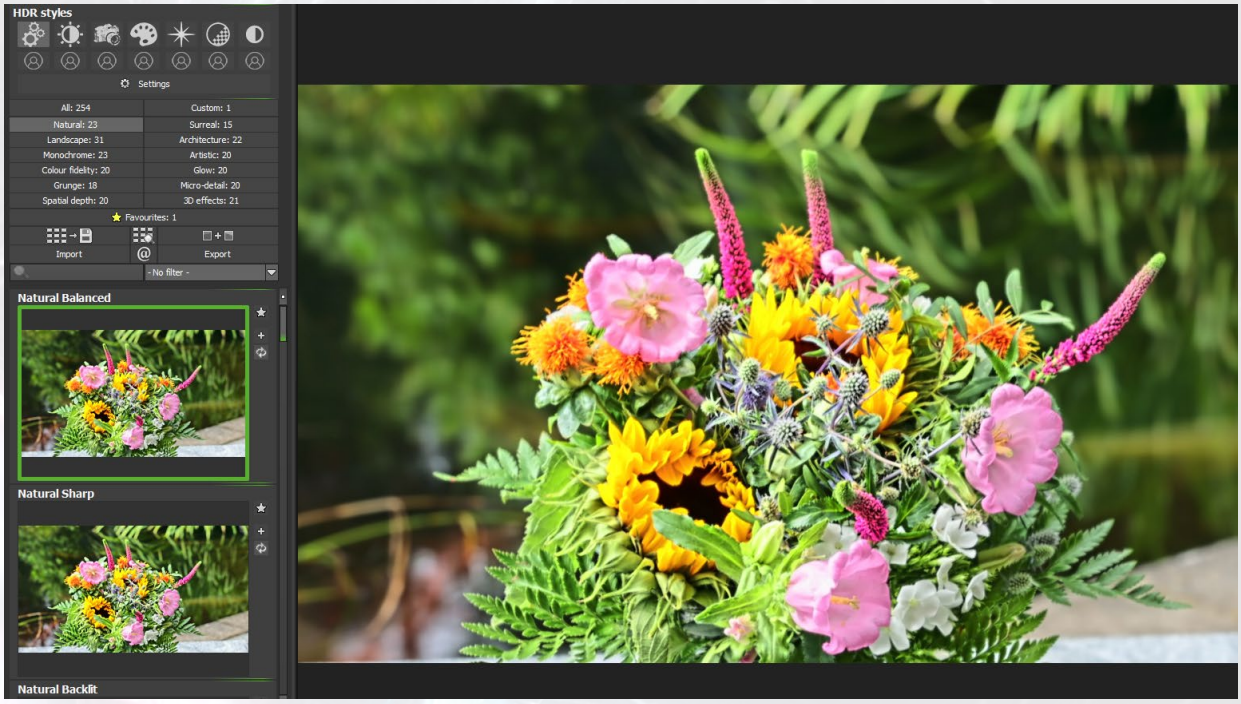
Select image format



In the next prompt, you have the choice between different file formats. If you decide in favour of the standard **JPG** format, for example, click on the green... button again.



... and make the final decision: How many images of the image sequence (**292 images in the example**) do you want to load directly? If you decide in favour of **every tenth image**, the loading process begins with automatic image alignment. The **30 images** (in the example) are loaded ...

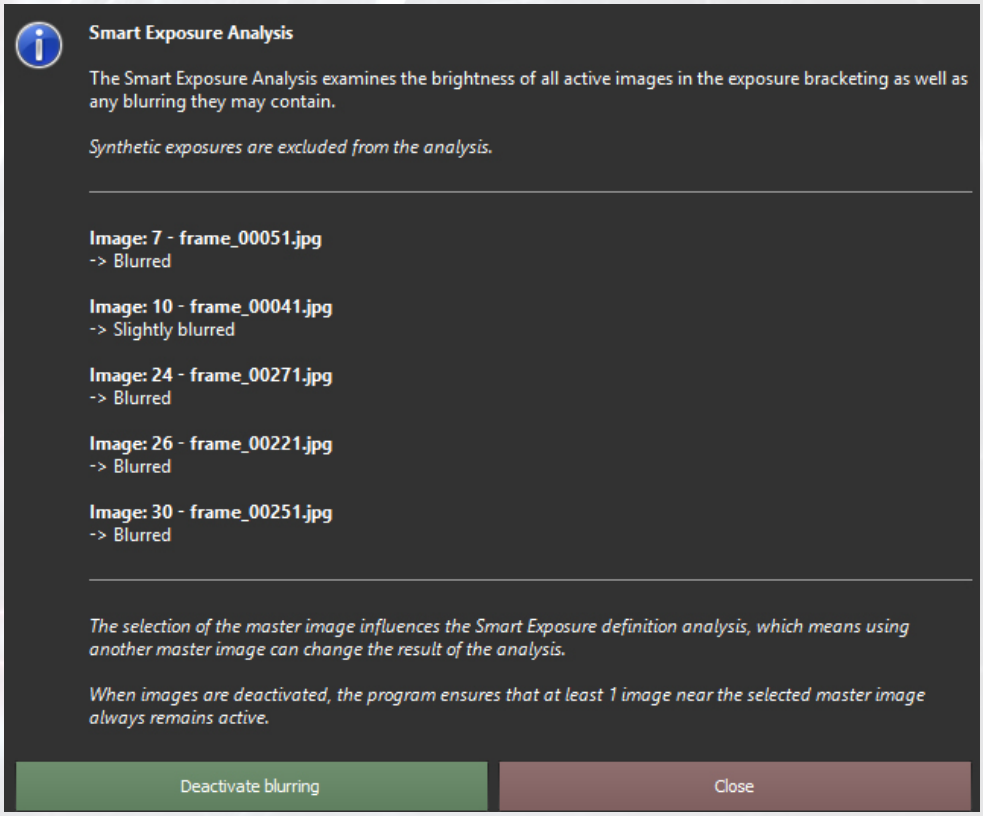


... and you can see the **resulting image after the HDR fusion in post-processing**.

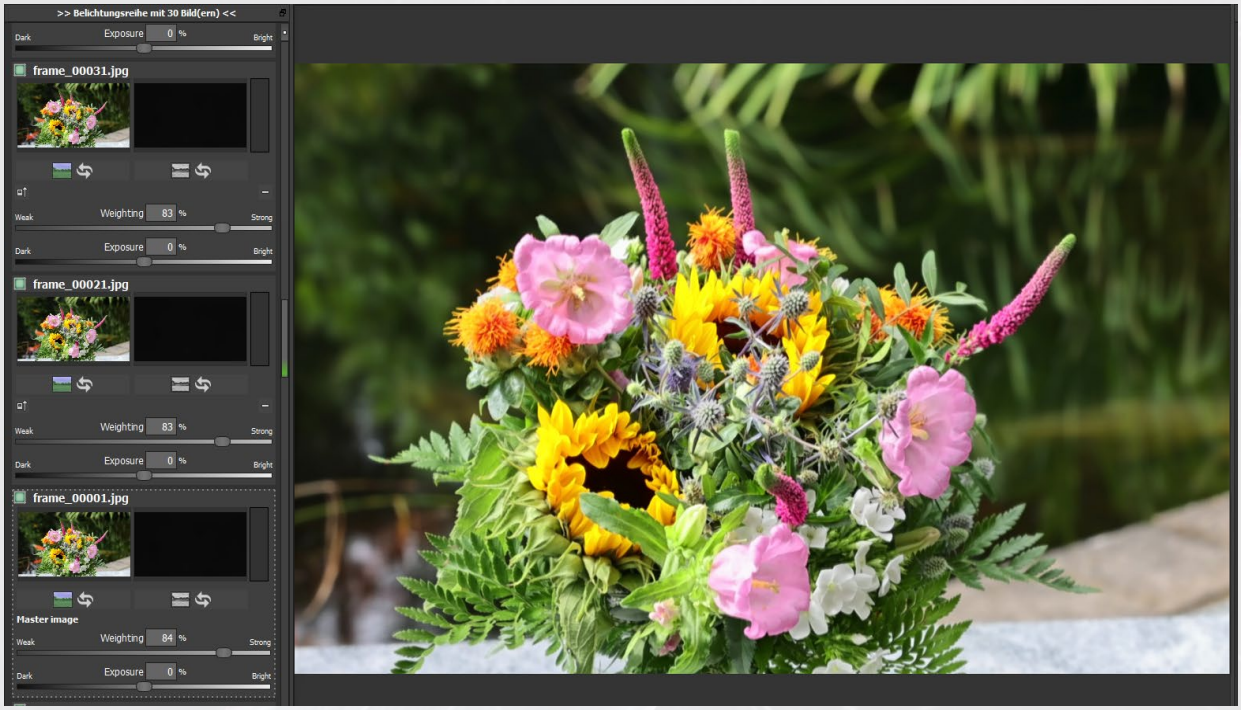
Eliminate blurred, incorrectly exposed images

The subsequent steps up to the finished image are identical to those of the individual image files or exposure series.

For video sequences with many converted individual images, it is always worth checking for blurred or incorrectly exposed images by clicking on the **Smart Exposure Analysis** button.



The analysis shows **4 blurred** and **one slightly blurred i**mage, which can be excluded from the recalculation by clicking on **Deactivate blurring**.

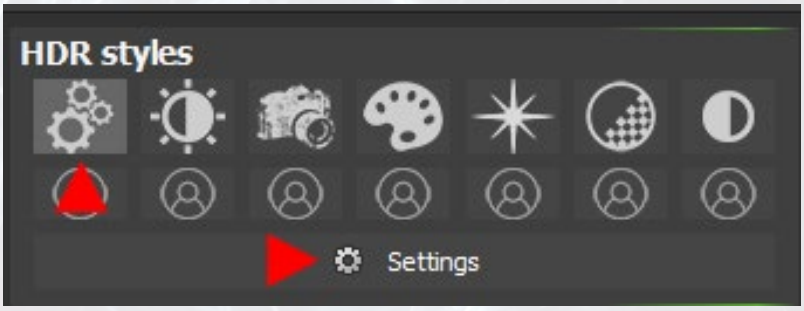


The resulting image is convincing after correction in the exposure bracketing ...

... and after switching to post-processing with an unusual richness of detail and variety of colours.

7. HDR-styles

Load an exposure series, a single image or a video sequence and see the result of the HDR concept:
- **HDR fusion via the algorithms**.
- **HDR style** and preset with the decisive **tone mapping** effect.
This combination essentially determines the desired image look or the intended image mood.
With the **HDR styles**, you can already define a desired **basic mood for the respective image motifs**.
Note: The general handling of the presets is the same in all programmes and is described in the **Presets guide**.



The preset HDR style **Balanced** ensures a harmonious and balanced HDR image as in the image example above. **This and all other HDR styles have an immediate effect on all selected presets.**
In the **top row**, select HDR styles with the respective standard settings.
In the freely assignable and configurable HDR styles in the bottom row, **you can create your own individual and personalised HDR styles** via settings if required.
In the following examples, the same image motif and the same preset with the tone mapping effect **AI - Balanced** have always been selected for better comparability.

Shadows and Light: This style ensures a **deep** and **brilliant image impression**.

Fine details: If fine detail drawing is required, this style, in which the **details are particularly emphasised**, can be the first choice. In the example picture, the structures of the leaves and the bricks are shown to their best advantage.

Grunge: This HDR style gives an image a surrealistic grunge look and can be an interesting, somewhat unusual and attractive alternative.

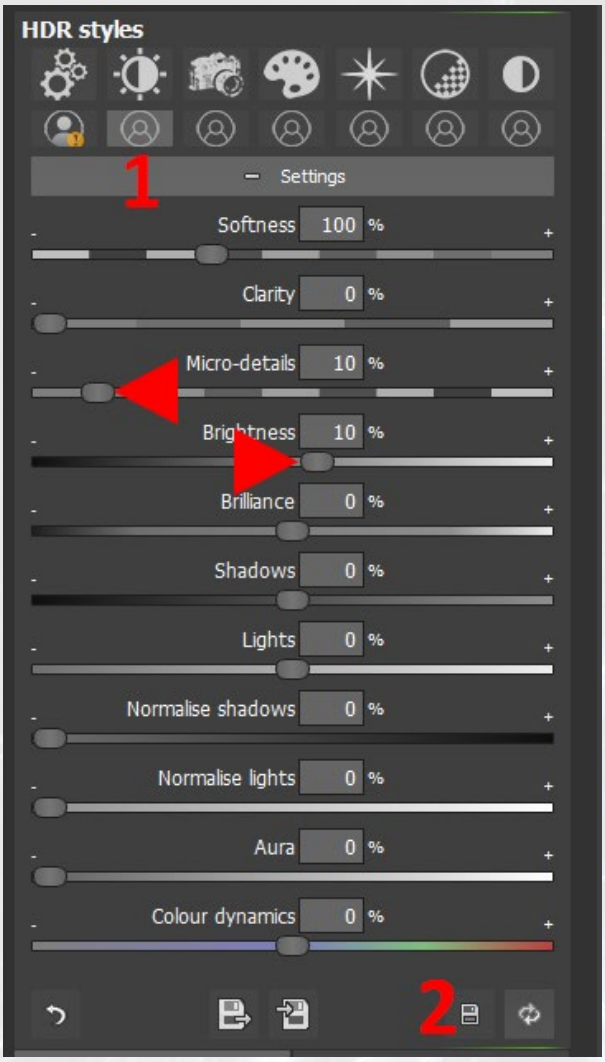
Radiant: This style also differs significantly from **Balanced** and makes the image motifs appear **brighter** and more **radiant**. The structures are significantly less pronounced compared to Fine Details, for example, and appear softer.

Monochrome: The last two HDR styles offer unusual monochrome variations: **Monochrome** activates a **harmonious and balanced style**.

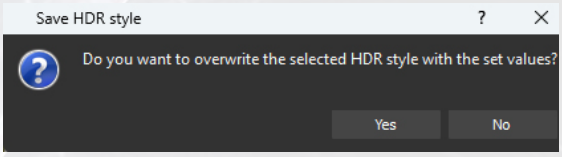
Monochrome deep: This style creates a ‘deeper’ monochrome image look: The deep are darkened slightly, the highlights are brightened, which creates a richer contrast and increases the depth effect.

Note: HDR styles are ‘linked’ to tone mappings (see next chapter). If a tone mapping effect is deactivated, switching an HDR style has no effect.

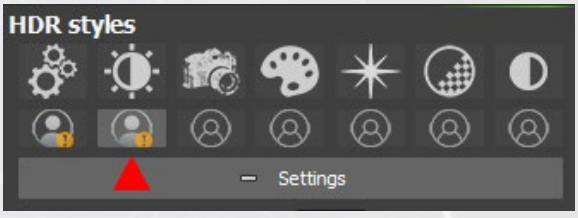
Configure your own HDR styles



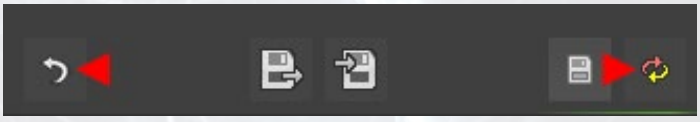
By clicking on one of the freely assignable HDR styles and then clicking on **Settings**, a configuration window opens in which you can influence the image look in the desired direction using the slider settings. In the example, the **Micro details** slider has been moved to the right and **Brightness** to the left below the HDR style **Shadow and Light.**



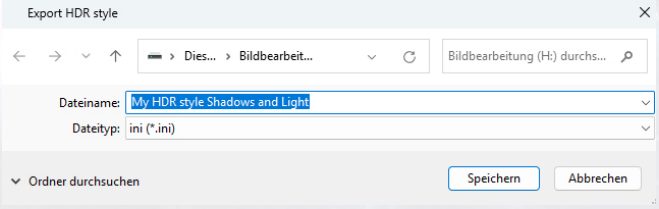
Click on Overwrite to display the prompt, which you confirm with Yes and thus save the currently set values.
Clicking on the minus sign collapses the configuration window.

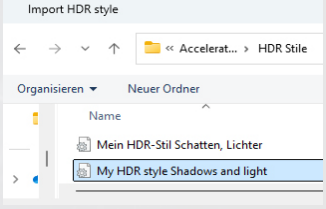


The **orange-coloured** circle with the exclamation mark indicates that the default settings have been overwritten according to personal taste.



Reset settings: Click on the coloured arrows to reset the **current HDR style** to the **default value**.
Clicking on the 'back arrow' resets **all HDR setting values to a neutral default setting**.

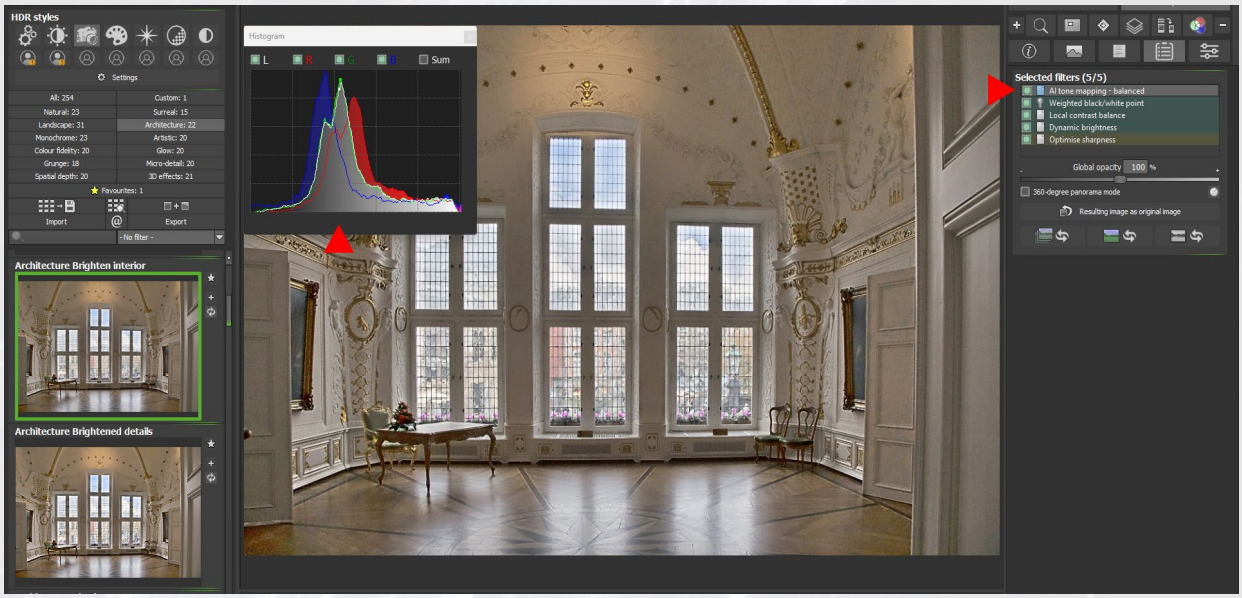




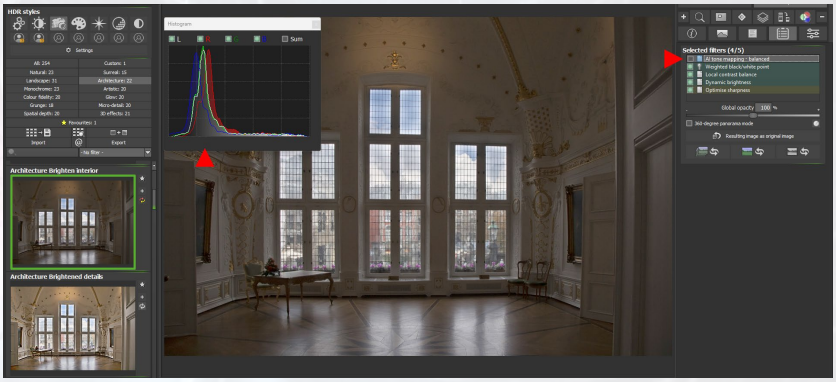
Export/Import: Click on the buttons in the centre to export or re-import the active HDR styles.

8. Tone mappings

Alongside **HDR fusion** and **HDR styles**, **tone mappings** plays a crucial role in the HDR process.
In **tone mapping**, the **dynamic range**, the adjustment of the brightest and darkest areas in the image, is **optimised**. This compression of the brightest and darkest tonal values changes the dynamic range to the visible range experienced in reality and leads to the impressive resulting images in HDR as in the image example below, which is confirmed by the two histogram comparisons shown. Some of the extraordinary **tone mapping effects** such as **AI - Balanced** in the image example are supported by artificial intelligence.

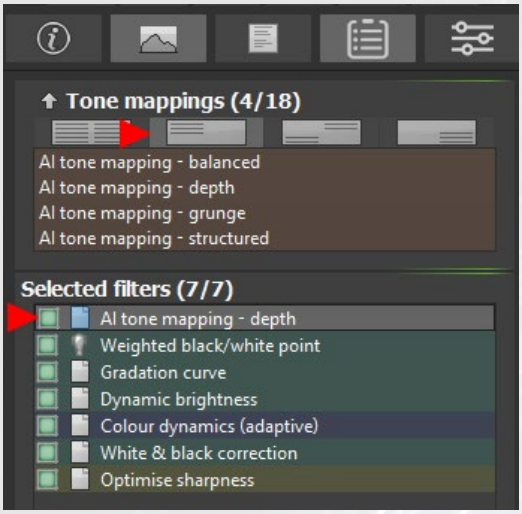


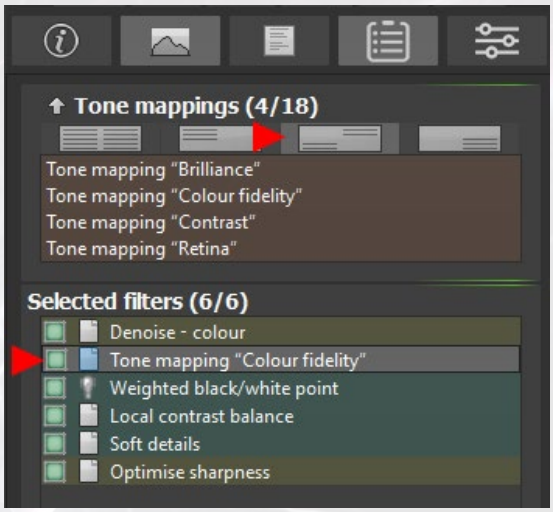
In the image example of a single image with the selected HDR style **Fine details** and the preset **Architecture Brighten interior**, you can see the effects associated with the preset when you switch to **Expert mode**.
The **tone mapping effects**, in the example **AI - Balanced**, significantly determine the image character in all presets.



If you switch off the effect by clicking in the green box, the difference is obvious: the background is 'correctly' exposed and the foreground is much too dark.
Note: The **Expert mode** with explanations on understanding and using the effects is described in detail in the **Expert guide**.

Interaction of HDR styles and tone mappings





In the **HDR styles** chapter, it was pointed out that switching from one HDR style to another must fulfil certain requirements in conjunction with the tone mappings:
In a selected preset, in the graphic on the left this is **Architecture Depth**, either an **AI tone mapping** from the list of tone mappings must be active, in the example **AI - Depth** or a tone mapping effect from the list of "modern tone mappings as in the graphic on the right with **colour fidelity** in the preset **Colour Fidelity Balanced**.

Overview of the tone mappings on offer

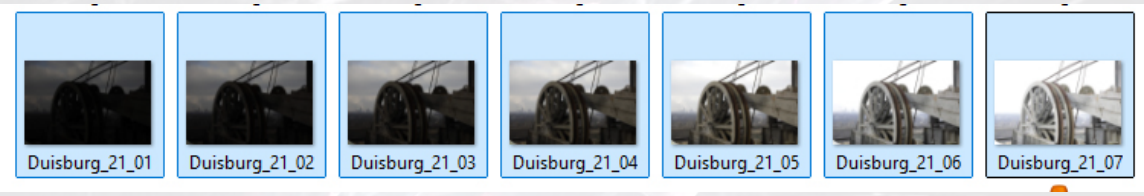
If you want to have an overview of all available tone mappings, click on the button in the toolbar.

The list that then appears is divided into **4 categories**. The corresponding tone mappings are displayed by clicking on a selected category (from left to right):

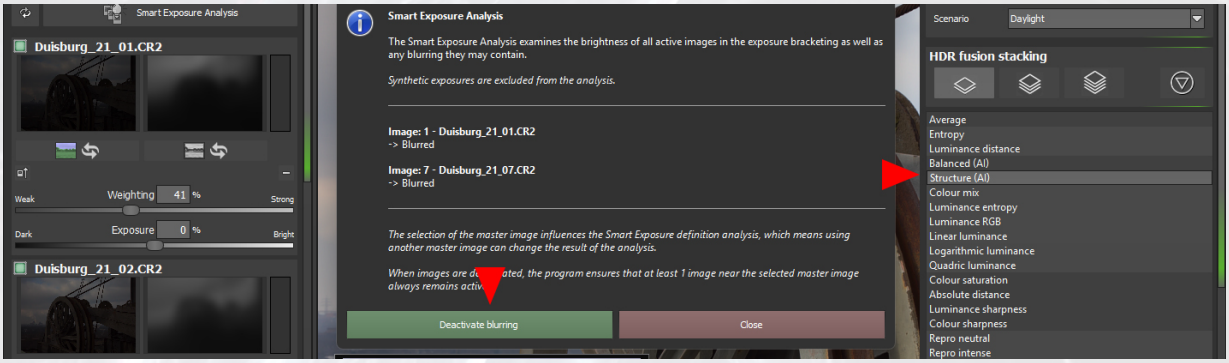
- List of **all available tone mappings**.
- List of **all tone mappings with artificial intelligence**.
- List of all **'modern' tone mappings**.
- List of all sound mappings **of past programme versions** from #1 to #4.

From the HDR fusion to the final image

In the flash workflow, you immediately saw the finished result image after loading an exposure bracket, in the following chapters the process of HDR fusion with many individual processing variants and then switching to post-processing. By adopting the standard presets and HDR styles or selecting a desired preset and alternative HDR style, you will see the final HDR image.
The following example shows once again the individual intermediate results and the final result image



For example, load this exposure series with 7 images, ...

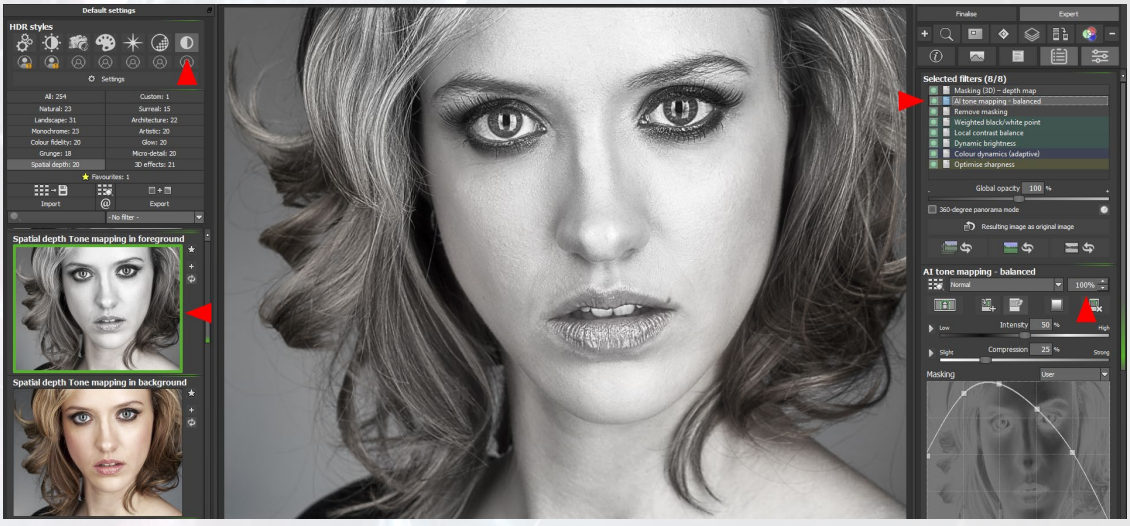


... the **Smart Exposure analysis** recognises 2 blurred images after switching to **Edit exposure bracketing**, which are excluded from the calculation by clicking on **Deactivate blurring**. **Structure (AI)** was selected as the algorithm and all other standard settings were adopted.

After switching to **post-processing**, the fusion image would look like this without HDR style, preset and tone mapping because all effects are deactivated.

Finished HDR image

In the example, the HDR style **Grunge** and the preset **Architecture Intensive** with the tone mapping **KI - Grunge** have been selected with a convincing result image that can be quickly customised to personal taste by selecting other HDR styles and presets.
Change opacity: If, for example, the tone mapping results in colours that are too 'colourful' for some motifs, the **opacity** can be **reduced** as desired in the parameters when the effect is active.
If the **overall effect** of the preset is too strong or needs to be increased, set the desired effect using the **Global opacity** slider.



The final image example shows that **HDR** can of course also 'do' portraits impressively. Here, the combination HDR style **Monochrome depth** was combined with the preset **Spatial depth tone mapping in foreground**. This preset category allows differentiated exposure, sharpening, blurring or application of tone mapping via the generated depth map, as in the example. The tone mapping effect is **AI - Balanced**.
The parameter presets for **Intensity**, which controls the strength of the tone value **compression**, and Compression, which can be used to influence the luminance of the bright areas if required, have been adopted.