Sensor error correction

SHARPEN

HDR

NEAT

DENOISE

LUT

FOCUS

COLOR

ZOOM   BLACK & WHITE

EMOTION

ANALOG   DIVE

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Guide to the basic functions of all programmes

Sensor error correction

Camera sensor errors, which can be caused by changing a lens, lint, dust, small hairs, water spots or other imperfections on the lens, lead to unsightly and disturbing spots in the image. They are particularly noticeable and clearly visible on smooth surfaces such as the sky or walls.

The sensor error correction module removes all these faults quickly and effectively. However, it can do much more than correct sensor errors: With the intelligent correction functions, other disturbing objects such as scratches, disturbing people or objects can also be removed perfectly.

In the editing window, simply place a marker on the fault with the mouse and the programme used will automatically search for suitable areas to replace them. If necessary, you can also move this correction area manually with the mouse to adjust the result even more precisely.

If you try out other presets after the sensor correction, it is possible that the interference points will become visible again, which can of course be corrected automatically. If possible, it is therefore advisable to use this module at the end of all processing.

The strength of this module naturally lies in error correction. However, if required, it can also be used creatively by 'cloning' parts of the image and thus realising unusual and surprising image fantasies.
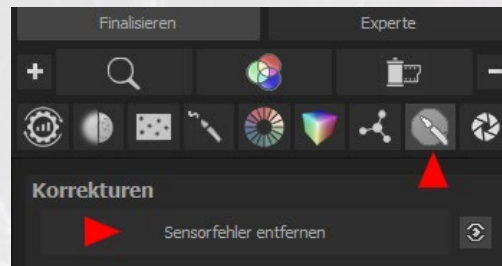
The user interface and operation of the editing window is the same in all programmes and makes it easy to find your way around when changing programmes

COLOR has been used as an example in this guide.

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1. Overview Correct sensor error window

Click on the **brush symbol** in the toolbar to display the **Sensor error correction** button.


Click the button again to switch to the editing window with the large image area in the centre and the reduced view with the tools and editing options on the right-hand side:

1. Reduced **image view** with zoom function.
2. **Contrast display** of the image subject to better localise sensor errors.
3. Activates/deactivates the **display of the corrected areas**.
4. Activates/deactivates the **display of the correction areas**.
5. **Selection of different quality levels** for the search of correction areas.
6. **Set mode (brush) to add a new correction area.**
7. '**Calculator**' that optimises all correction areas.
8. Deletes **all** existing **correction areas**.
9. Sets the selected correction area to **automatic mode**.
10. Deletes **one** selected **correction area**.
11. **Export/import** of the current correction ranges.
12. **Closes the window** and accepts all correction areas.

2. Flash workflow for removing sensor stains

Many of the functions and tools listed in the previous chapter are used for better visualisation or optimisation of the correction areas and are explained in further chapters.
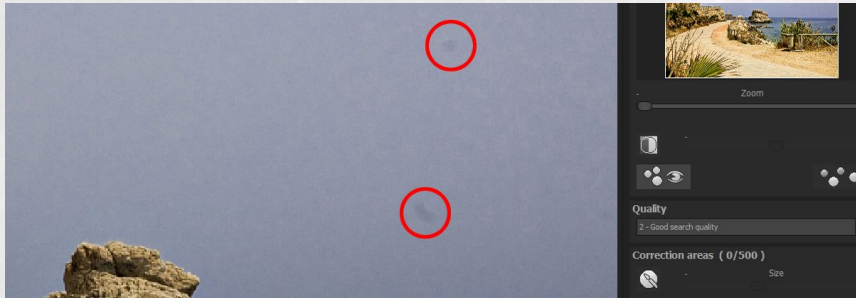
In most cases, where only one or a few imperfections need to be eliminated, in the image example sensor spots, this can be done very quickly and easily in **3 steps** with **one tool**, the **brush tool** or **placement mode**. This is why this flash workflow directly follows the chapter with the overview.
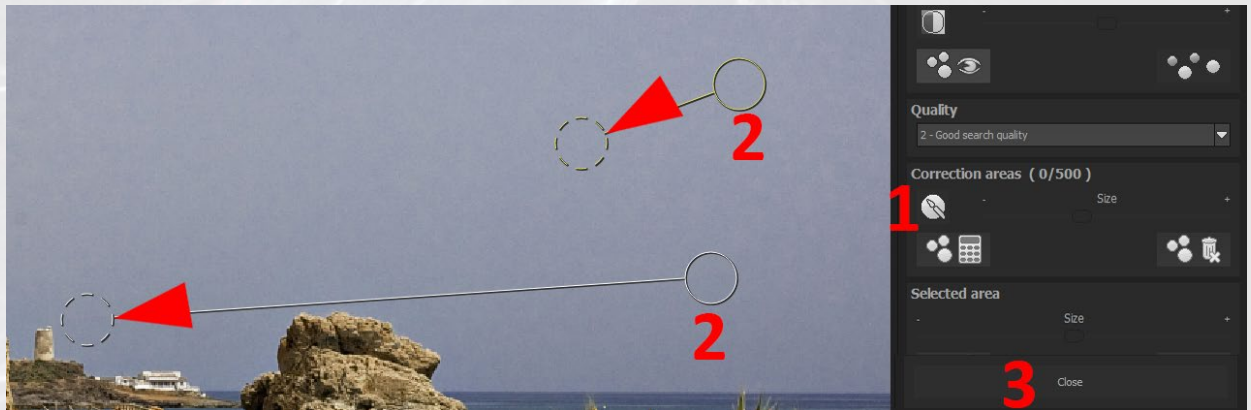

Flash workflow: **Activate the brush** (**1**), **position the circle on the fault** (**2**), click on **Close** (**3**) to return to finalise mode - done!

The secret of this speed lies in the intelligent automatic programme: the moment you have located the fault with the circle, you trigger the automatic process with a click of the mouse: The program quickly searches for a **reference point in the image without a fault**, which is visualised by a dotted circle and **replaces the marked image area, the fault**. Click on the button with the brush symbol again to mark the 2nd sensor spot in the image example, confirm the position with a mouse click and return to finalise mode by clicking **Close**.

**In most cases, the result is so convincing that no further optimisation is necessary.**

The individual steps are explained in more detail below.

Vergrößerung des Bildausschnittes:
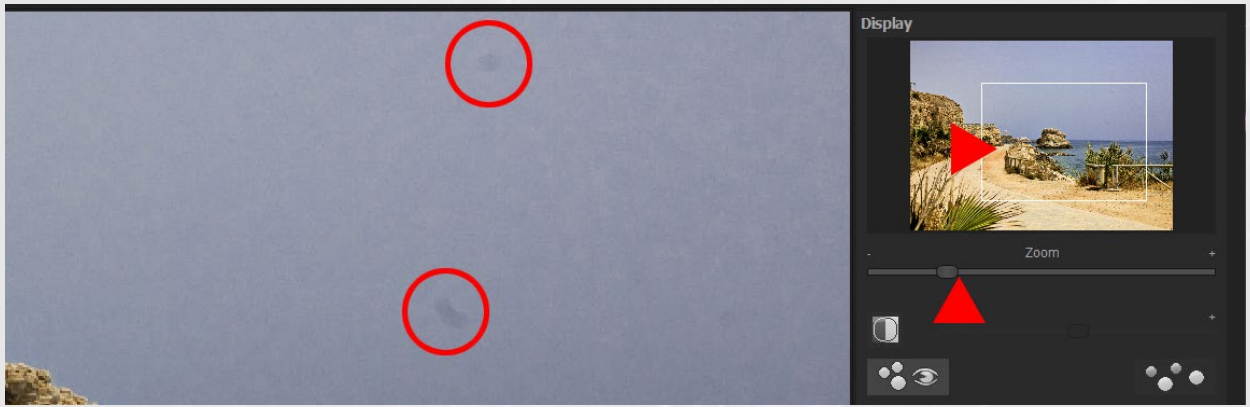
 better localise the interference points, you can enlarge/reduce the image section with the mouse wheel upwards or downwards and move the image section to the desired position in the image by holding down the mouse button. Alternatively, drag the **zoom slider** to the right up to the desired zoom level and move the white-bordered rectangle to the desired position while holding down the mouse button.

Better visualisation of faults via the contrast display:
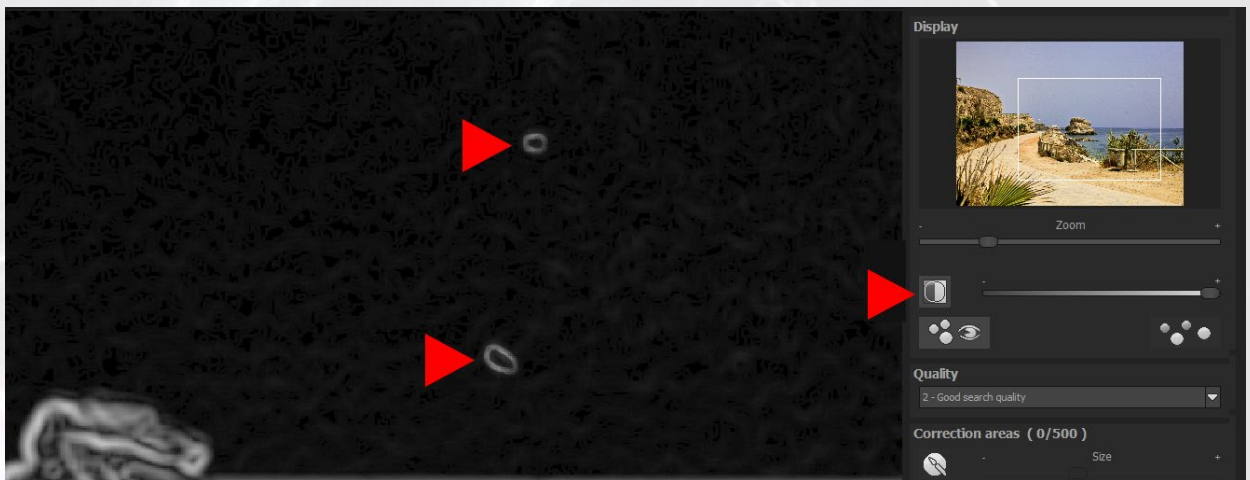
If the sensor spots are difficult to localise, the **contrast view** can help: Click on the button to display it and use the slider to the right to further emphasise or attenuate it. The interference spots are outlined in **white** and therefore stand out more easily from their surroundings. Click the button again to hide them again.

Note: The programme cannot, of course, distinguish between 'normal' details in the image and the sensor spots you are looking for. Therefore, other areas of the image are also outlined in white, but can be easily distinguished from the interference spots.

Mark fault location
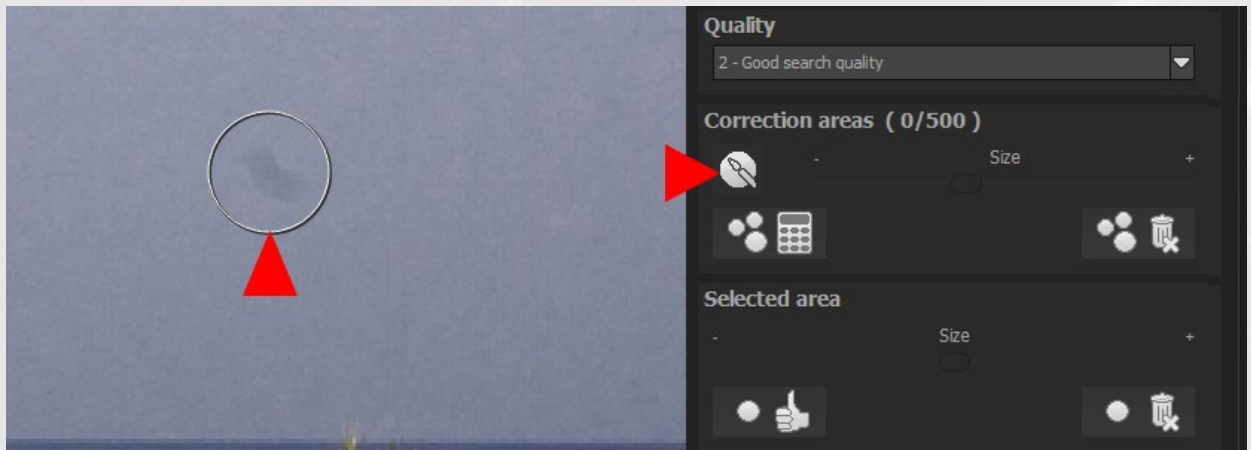
Activate setting mode/brush: By clicking on the **brush symbol** to define the new correction area, a circle becomes visible in the image at the mouse arrow, which can be varied in size using the slider to the right of the button or using the plus or minus buttons, which has the advantage that the mouse does not have to be released.
The circle should always be slightly larger with 'leeway' than the error itself so that the correction is optimised.

Position the circle: If you now position the circle on the sensor spot and confirm the position with a mouse click, the programme automatically and quickly searches for a 'corresponding' or most suitable area in the image that replaces the interference spot so well that the correction is not noticeable.

Visualisation of the reference point: This area is displayed in the **dashed circle** and parallel in the circle with the original fault location.

Display of the correction ranges made: At the same time, the display next to **correction ranges** changes from (**0/500**) to (**1/500**) and documents that one of 500 (!) possible corrections has been made to the image.

Hide display: If you move the mouse outside the window, the display disappears and shows an overview of the image with the corrections.

All other imperfections are treated in the same way after reactivating the brush.
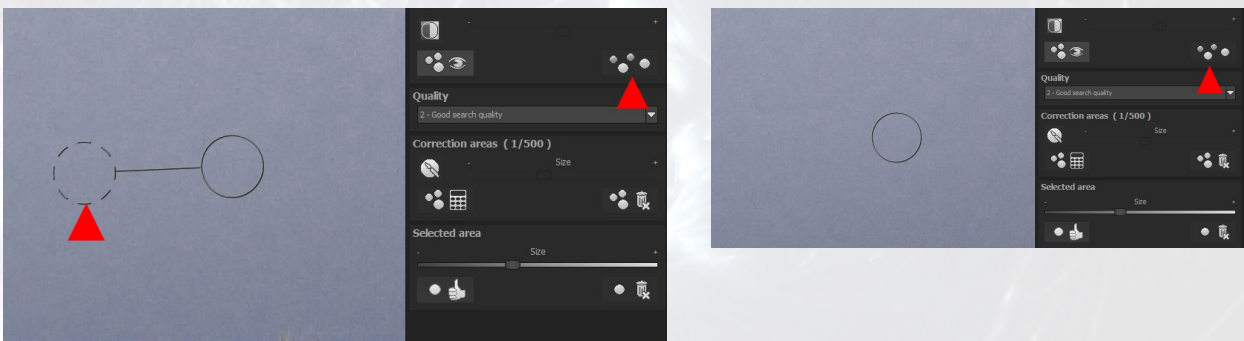
3.   Show/hide correction areas
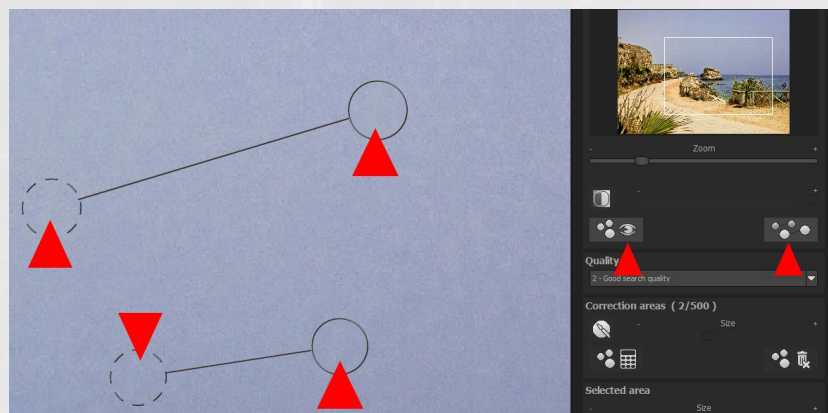
The 2 buttons below the contrast display can be used to switch the displays of the **corrected areas** (left) and the **correction area targets** (right) on and off.
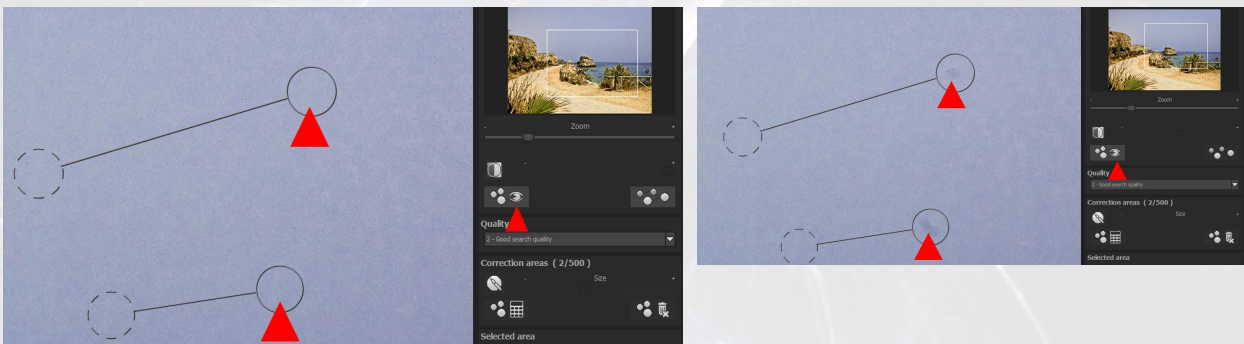

Display corrected areas off/on: As soon as you have made a correction, the area is replaced by the appropriate correction area and is no longer visible (graphic on the left). This default setting is visualised by the greyed-in button. If you want to make the fault visible again (graphic on the right), click on the button with the **eye symbol**. Click again to hide the fault again.

Display of the correction area targets: The correction area targets indicated by the dashed circle are also visible by default (graphic on the left) and the button is greyed out. Clicking on it switches off the display and hides the area targets (graphic on the right). Clicking the button again shows them again.

4.   Delete individual/all correction areas

You can delete **one** correction area by clicking on the **button with the recycle bin** symbol and **one dot** or **all** correction areas by clicking on the **button with the recycle bin symbol** and the **3 dots**.
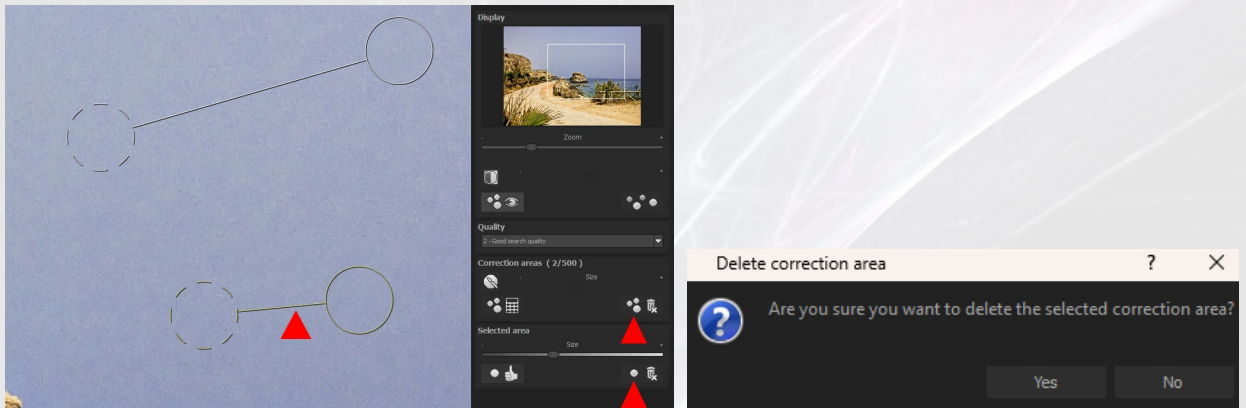

Delete one correction area: If you move the mouse over the correction area that you want to delete, the lines are coloured yellow. Click in the source or target circle to activate it.

Click on the button below to display a prompt asking whether the selected correction area should really be deleted.
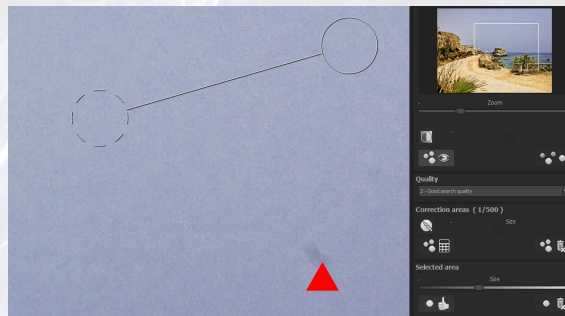

If you confirm the query with **Yes**, the correction area is deleted and the fault is visible again.
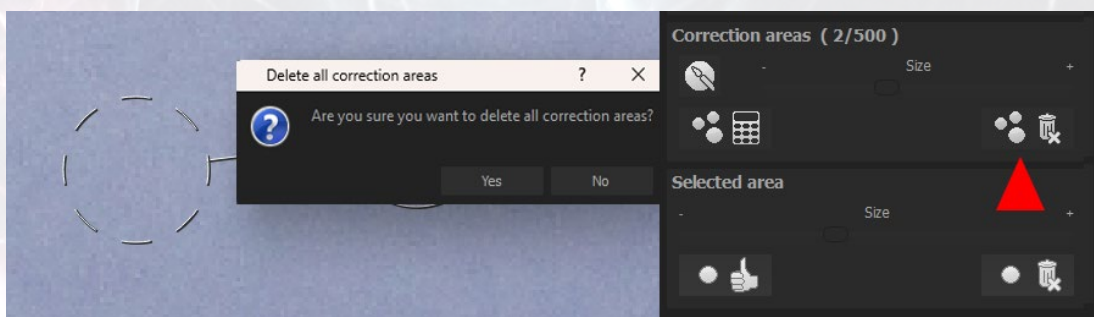
Delete all correction areas: Click on the top button to display a prompt asking whether you really want to delete all correction areas. If you confirm the query with **Yes**, you will immediately see the original with all the fault areas.
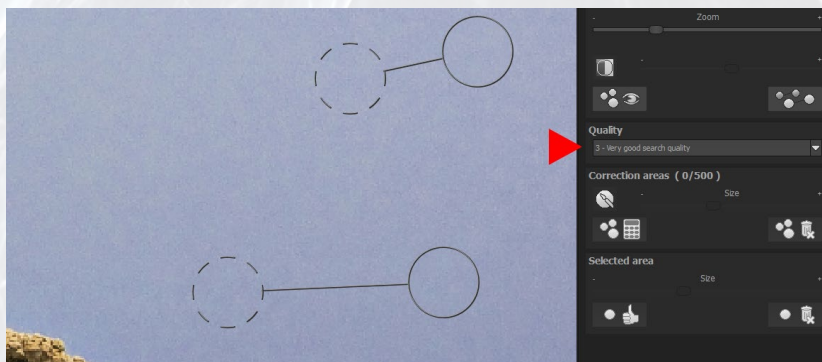
5. Select quality levels

The preselected quality levels determine the quality and the radius with which the appropriate areas are searched for to replace the imperfections in the image.
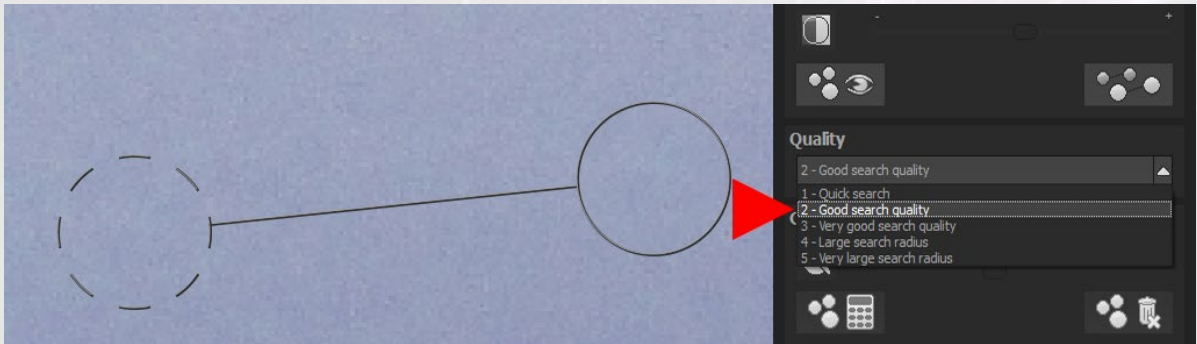

In most cases, the default quality **level 2 - good search quality** provides very good results. If required, you can choose between 5 quality levels and change the search quality to the next quality level, for example.

If you have already set correction areas, the area for which you want to change the quality level must be deleted as described in the previous chapter. The newly set quality level applies to all other new correction areas.


Example quality level 3: Search radius and target area differ only slightly from the level set by default.
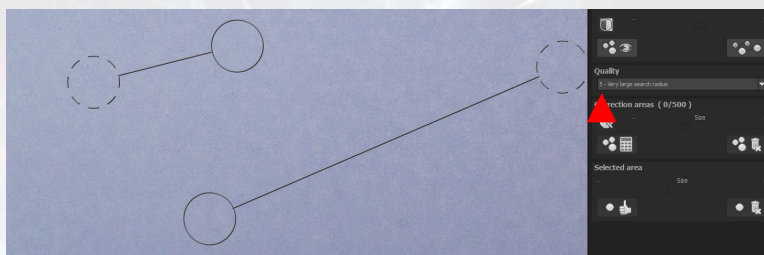

Example quality level 5: The highest quality level causes the automatic programme to select what it considers to be an even more suitable reference range.

## 6. Set correction range manually, correct automatically

In exceptional cases, it makes sense to move correction areas manually.
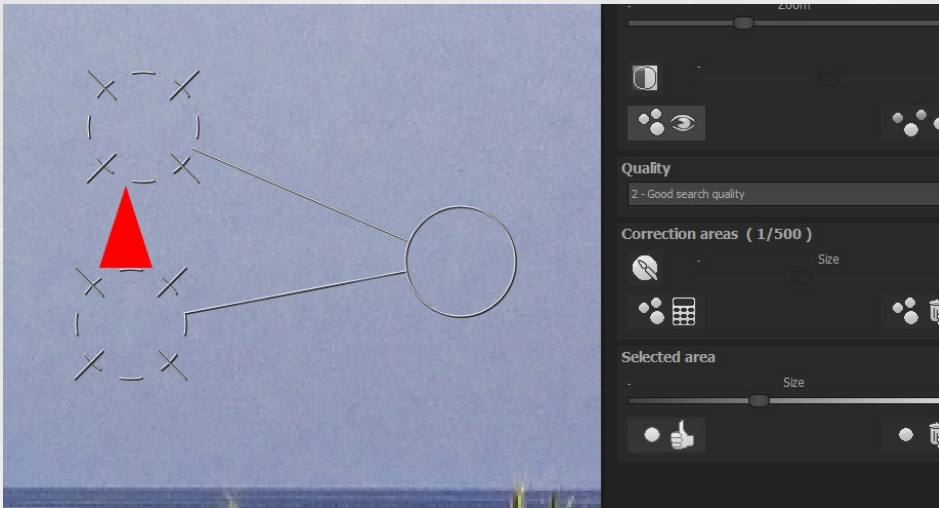
Move the exchange area: By simply clicking in the dotted circle, you can drag it in any direction and release it at a desired position.
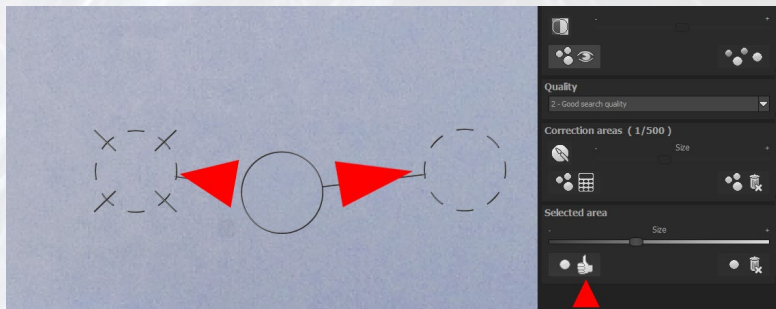
Automatic correction: If you have set a correction area and set the **replacement area manually**, an alternative replacement area is **automatically** searched for by clicking on the 'Thumb up' button.
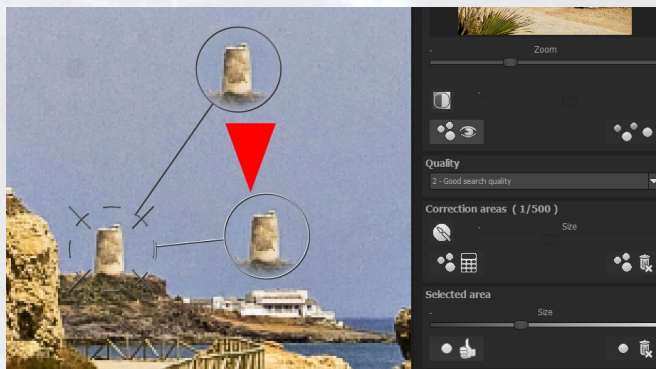

Set the exchange area and correction area manually: In this case, the **exchange area** has not been set to an interference point for better demonstration (see also the **Cloning** chapter). The correction area can now be moved as required and placed in the desired position.

7. Correct correction ranges after preset change if required

Click Close to return to the same preset in **Finalise mode** as before the change. If you now try out other presets, the corrections will be just as effective for most presets.

There is a simple solution for the exceptions such as the preset **colour scheme coffee** in the example image, where the imperfections are visible again:
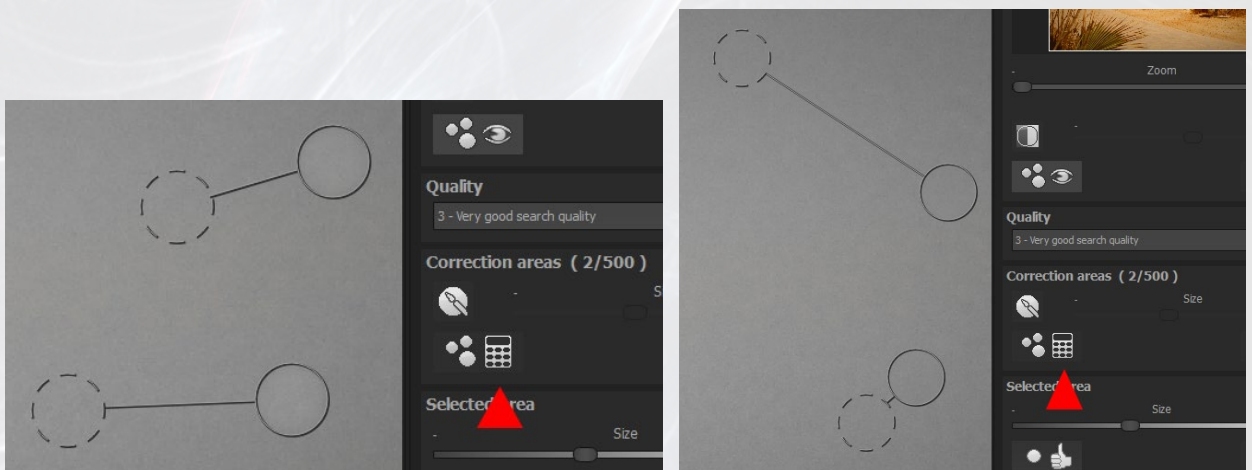
Switch back to **Remove sensor errors** and click on the button with the **calculator symbol**. All optimum correction points or replacement areas are recalculated in a matter of seconds.


When you switch back to the **colour scheme coffee** preset, the sensor spots are eliminated. You can repeat this process with the correction using the calculator as often as you like for other presets.

Note: Due to the 'problem' described above, the corrections in **Remove sensor errors** should be placed last in the workflow if possible.

8. Data exchange: Export/Import

The current correction areas can be saved in a file if required, either to make them available to other users or to import the correction areas again when loading the same motif at a later date. If you only use the correction areas yourself, **saving them as a project** fulfils the same purpose: when the project is called up later, all correction areas can be displayed in the **Remove sensor errors** module and added to or corrected as required.
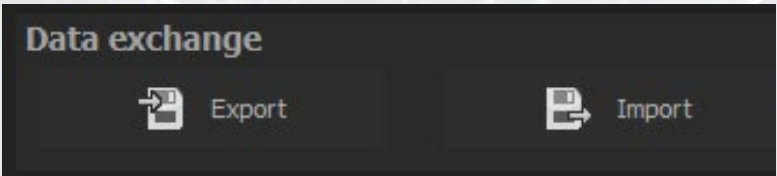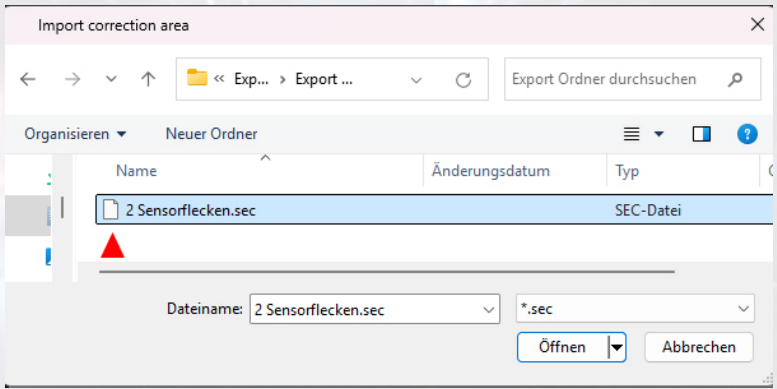

Export: Click on the **Export** button …
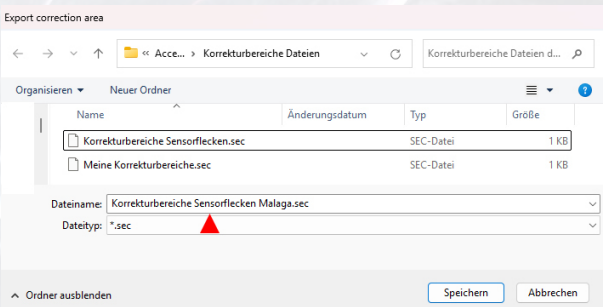
… select the desired folder and save the file, preferably with a 'descriptive' name so that you can find it again quickly later.
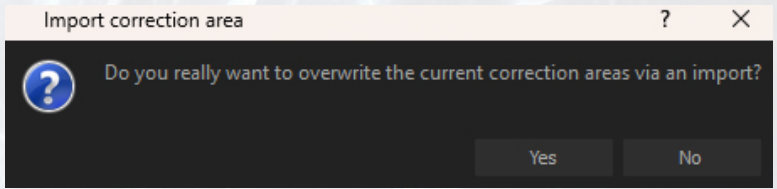
Import: Click on Import to display a prompt asking whether the current correction areas should be overwritten by the import. Confirm this with Yes, …

… import the desired file by double-clicking and see all saved correction areas.

9.   Eliminate faults of any kind

Of course, this module can be used not only to remove sensor spots, but also to remove any kind of interference from objects or people.

Picture example 1: In contrast to reality, the unpleasant and annoying mosquito bites are eliminated in seconds.

Image example 2: If necessary, correction areas can also overlap (graphic on the right) if the size of the brush cannot cover the entire object or subject as a correction area.

10. Creative use: cloning

Just as you can **remove** imperfections, you can just as easily and quickly do it the other way round: select, duplicate or multiply objects. This creates 'normal', interesting or funny variations in a flash.

Image example 1: The yellow balloon is to be duplicated.

Step 1: Select the correction brush and position the circle somewhere near the balloon. The position of the automatically selected exchange area does not matter.
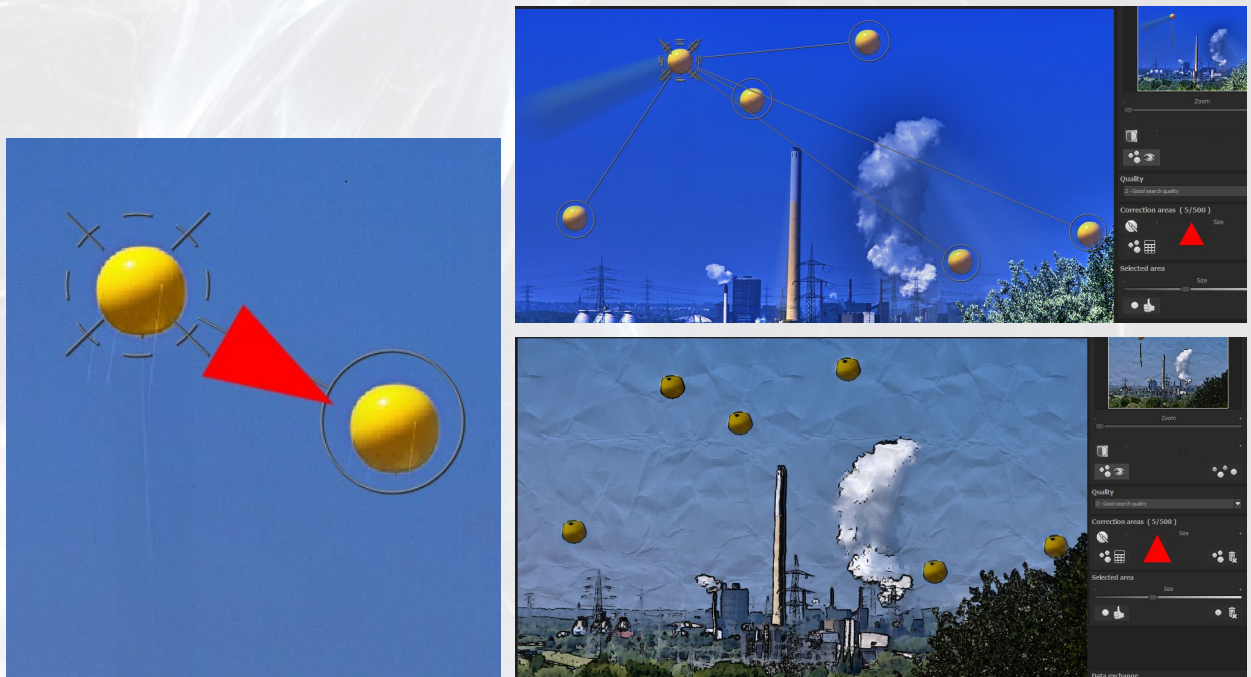
Step 2: Click in the **dotted circle** (exchange area), drag it onto the object you want to clone and position the correction circle with the **solid line** as desired - done!

Correction: By clicking in the correction or exchange circle, you can correct the respective position as required. You can repeat this cloning as often as required. In the right-hand graphic above, after cloning 5 times, the **Landscape light beams** preset has been selected, in the graphic below, **Artistic scribble**.

Image example 2: Cloning pancake topping

Here, the pancake should be topped a little more generously with the somewhat sparse topping of a plum.

 Just as in the example with the elimination of the person from the sea, when cloning objects that are larger than the circle, you can position and **overlay the dotted exchange circle several times** in order to be able to clone the fruit completely, as in the image example.
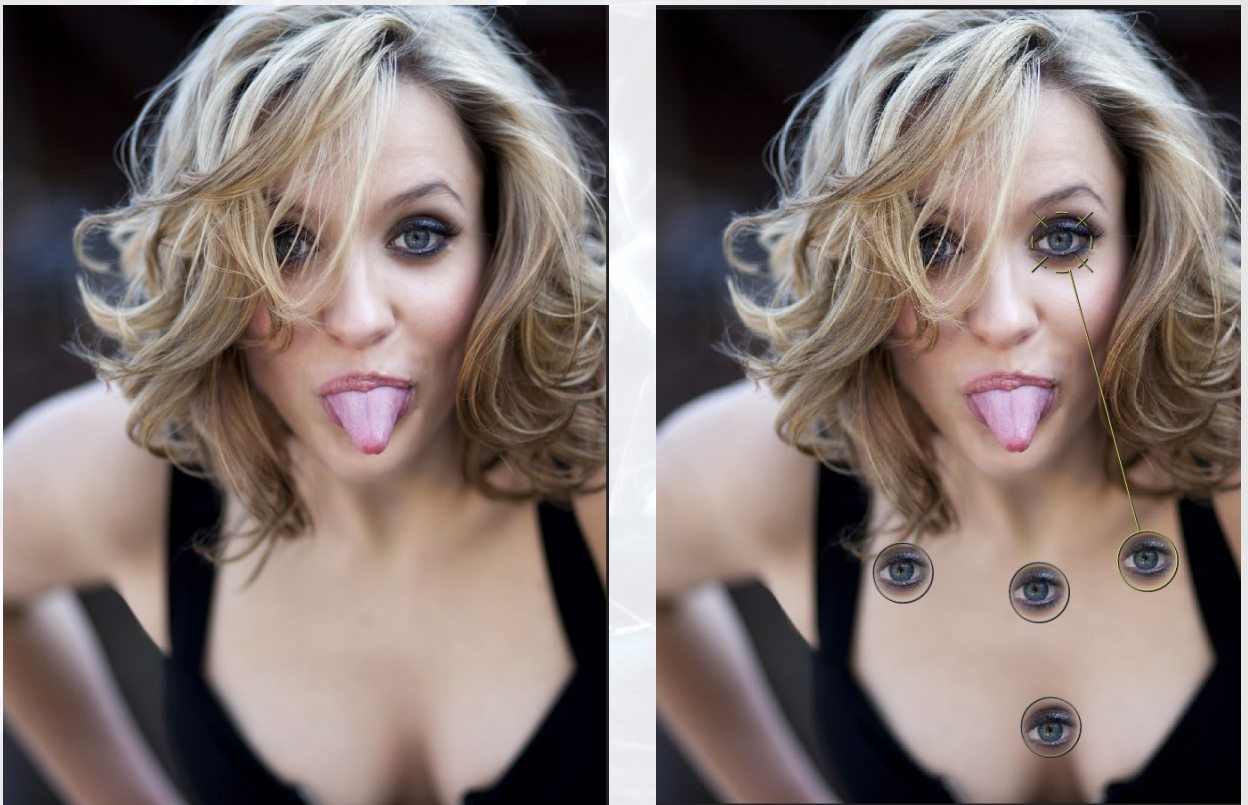

Image example 3: This example also shows that this module can be used in a variety of ways and that even unusual ideas can be realised quickly and easily.