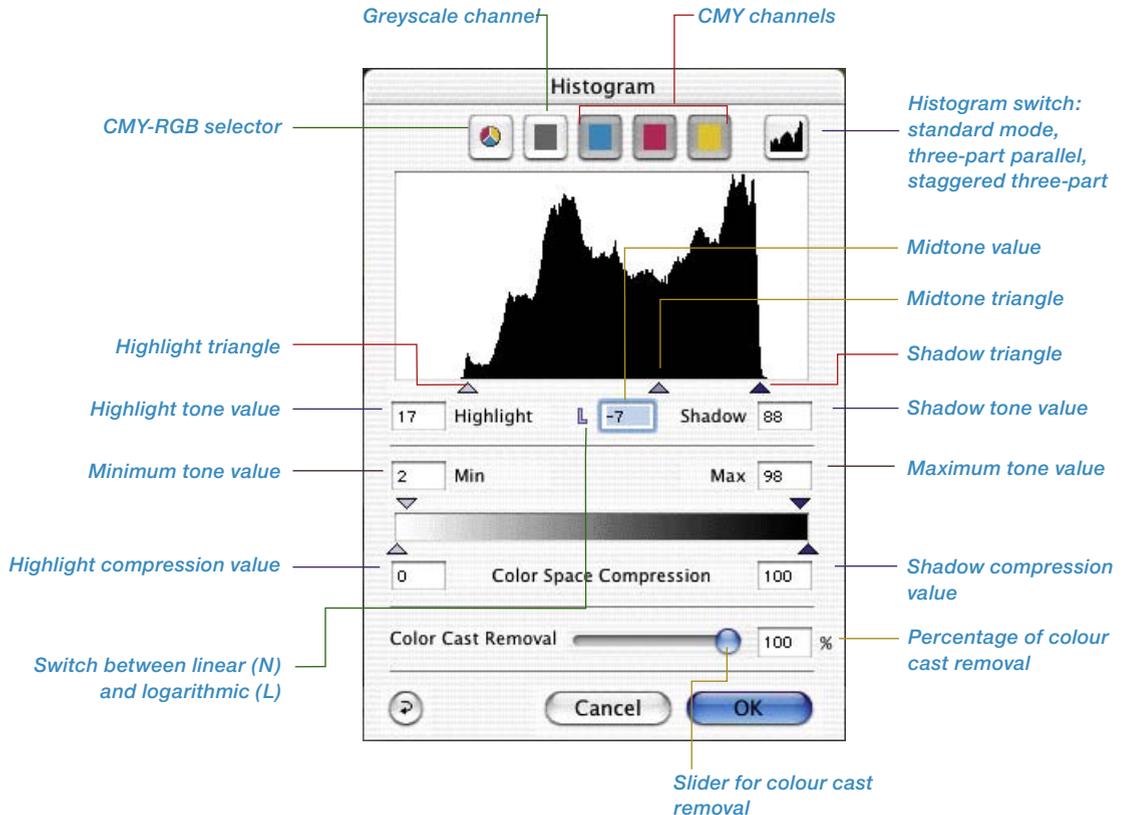


## 5.3 The Histogram

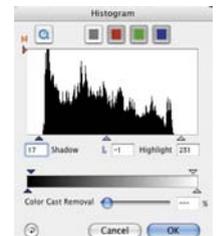


The histogram in *SilverFast* is a powerful tool with which you can examine image data in order to optimise them manually. We already used the histogram with the auto-adjust for control purposes.



### Histogram-Dialogue in *SilverFast...SE* versions

The dialogue is simplified in all *SilverFast...SE* versions and is recommended for novice users.



By setting the highlight / shadow points in the histogram, the available tonal values are expanded to occupy the entire greyscale of 256 values. The image becomes significantly more brilliant. In *SilverFast*, a variety of methods can be used to manually optimise the histogram.

**a. By Observation of Image Display**

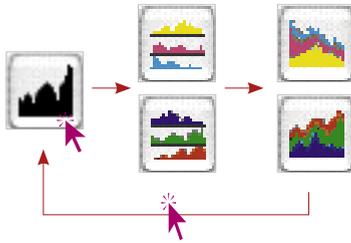
While moving an end-point in the histogram, the image will be updated in the scan frame in realtime, showing the effect of the adjustment immediately.

**b. By Observing the Densitometer Readings**

While moving an end point in the histogram, you can immediately observe the changed values in the densitometer readings. By pressing the “Shift” key and clicking on a part of the image with the hand-symbol on the scan frame, the densitometer will be fixed at this point until you click again while pressing the “Shift” key. Now you can control exactly what changes on certain parts of the image occur when moving the triangle points on the histogram.

For further info check out the chapter “Multiple densitometer (Multiple FixPip)“.

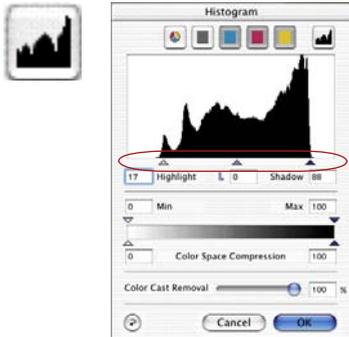
## Three-Part Histogram



The histogram of the presentation of each individual colour channel (R, G or B, or C, M or Y) can be switched to the parallel presentation of all three-colour channels (R, G and B, or C, M and Y) in all *SilverFastAi* plug-ins, starting with version 5. A feature which greatly simplifies working with the histogram and make it clearer.

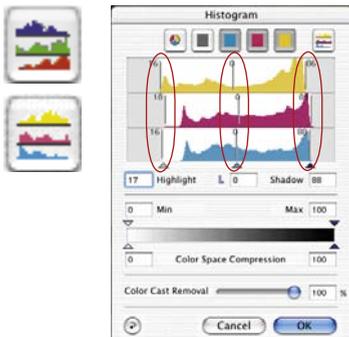
Switching is done by clicking an icon in the upper right portion of the histogram dialogue. An additional click on the icon will switch to the next indicator mode. The indicator modes are as follows:

### 1. Standard Mode



Only one colour channel is shown in the dialogue window in this mode. By means of the icons above the graphic, you can choose between total presentation and individual channels. Setting lights, depths and middles can be done by click-dragging the small triangles below the graphic.

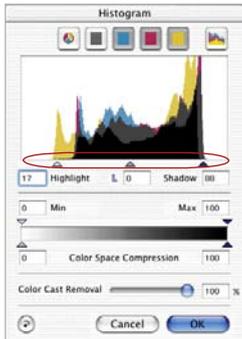
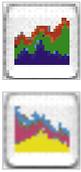
### 2. Three-Part Parallel Presentation



All three-colour channels are each shown as a single graphic in this mode.

Dragging the numbered vertical lines in the individual diagrams will set the lights, depths and midtones. The numbers at the lines indicate the amount of shading that will be used for light, midtone and depth.

In addition, you can switch between total presentation and the presentation of the individual channels by using the icons above the graphic.

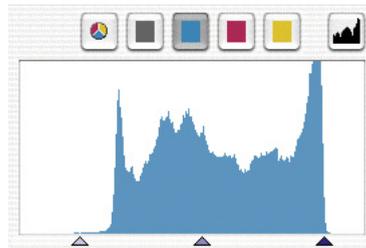


### 3. A Staggered Three-Part Presentation

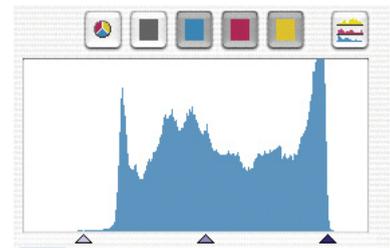
All three colour channels are displayed, one after the other, in a graphic, together with the total curve. Setting lights, depths and middles is done by click-dragging the small triangles below the graphic.

#### Histogram Channel Selection

To choose a single colour channel in the histogram, for example the cyan channel, click on the appropriate button. To manipulate two channels simultaneously, hold down the “Shift” key and click on a second channel button. To activate all three channels, click on the grey button.



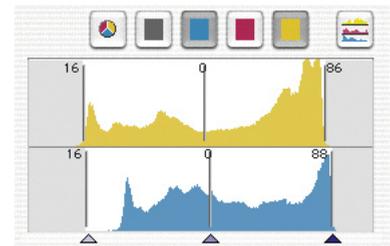
*Histogram in standard mode,  
only cyan is selected*



*Histogram in three-part mode,  
only cyan is selected*



*Histogram in standard mode,  
cyan and yellow are selected*



*Histogram in three-part mode,  
cyan and yellow are selected*

## Automatic Colour Cast Removal

The procedure for removing colour casts from scanned artwork has been greatly improved since the *SilverFast* version 5. Now the user can not only remove a possible colour cast automatically, but also determine the degree of colour cast reduction by means of a slider. The changes will appear in the large preview of *SilverFast* in realtime.

Of course, the automatic function can be deactivated or activated as desired by using keyboard shortcuts and the degree of the automatic colour cast adjustment can generally be limited to desired optimum values (see “Options...” \ “Auto” \ “Colour Cast Removal”).

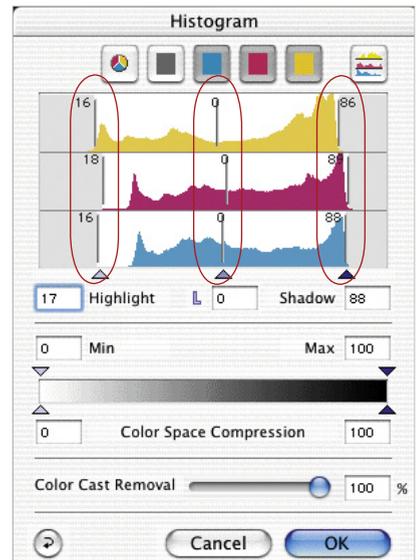
The automatic function for colour cast removal can be activated or deactivated by presetting, depending on the scanner and its qualities.



If the icon for “auto-adjust” is “normal”, meaning it has a grey background, *SilverFast* will remove an existing colour cast by clicking on the icon.

The result can be seen in the histogram as follows:

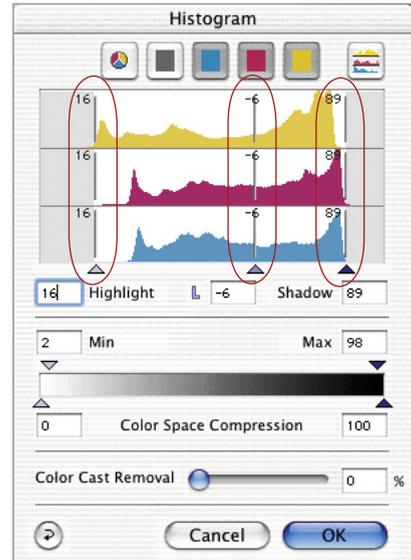
The sliders for highlight, midtone and shadow areas are off-set, indicating different values and the amount of colour cast removal is shown in the indicator panel as a percentage.





If the icon for “auto-adjust” is coloured, *SilverFast* will retain an existing colour cast and it will **not** be removed by clicking on the icon.

The result can be seen in the histogram as follows: The sliders for highlight, midtone and shadow areas are all vertically in line, indicating identical values and the amount of colour cast removal is shown in the indicator panel as a line with no value.

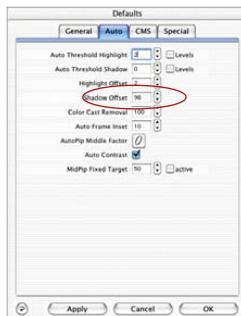


### Using the Slider for Manual Colour Cast Removal

By using the slider you can determine how much of an existing colour cast you would like to remove. By moving the slider with your mouse you can see the resulting changes in realtime in the preview, as well as in the individual diagrams of the histogram dialogues. A value of “zero” for colour cast removal means that the colour cast will be retained. A value of “100” means that the colour cast will be completely removed.



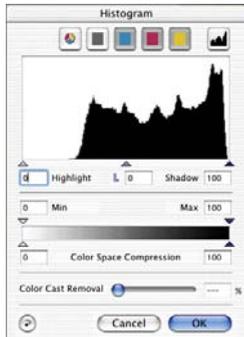
If you would like to remove a colour cast by manually dragging the slider to an individual histogram, the automatic function is of course eliminated. The indicator panel for the colour cast removal is then crossed out.



You can change the presetting of optimal values for automatic colour cast removal in the dialogue “Options...” / “Auto” / “Colour Cast Removal”.

## Optimising a Histogram Manually

In the left image at the bottom of this page, we have fixed the densitometer on the white area (which should become a neutral white). The values displayed show that a slight touch of red (C11-M17-Y16) is present. We now want to eliminate the reddish cast and generate a neutral white of a value of 5-5-5 and start with the cyan channel first.



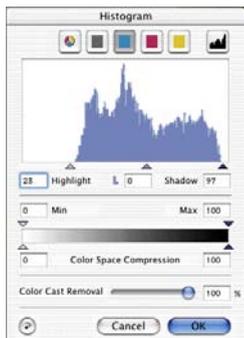
*Histogramm not opti-*

C	18	→	11
M	25	→	17
Y	24	→	16



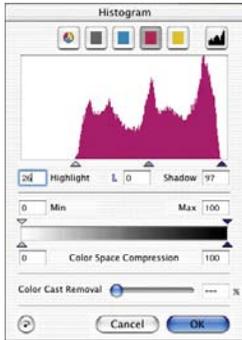
### a. Optimising the Cyan Channel in the Histogram

Click on the cyan button. Now we move the highlight triangle in the cyan channel towards the beginning of the first cyan pixel until the densitometer reads the value “5”. Notice that we had to move the triangle slightly to the left of the first pixels. Had we moved the triangle exactly onto the first pixels, the densitometer would have read a value of “0” for cyan.



*Histogram optimised  
(cyan only)*

C	18	→	5
M	25	→	25
Y	24	→	24



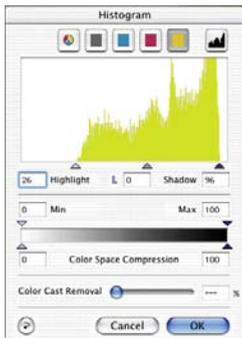
### b. Optimising the Magenta Channel in the Histogram

Click on the magenta button. As above, we now define the magenta channel. By moving the triangle we also realise the value of “5” for the magenta display in the densitometer.

C	18	→	5
M	25	→	5
Y	24	→	18

### c. Optimising the Yellow Channel in the Histogram

Click on the yellow button. Here, too, we move the triangle until the densitometer shows a value of “5”. We now can see that within the image a beautiful, neutral white has developed, as shown on page before.



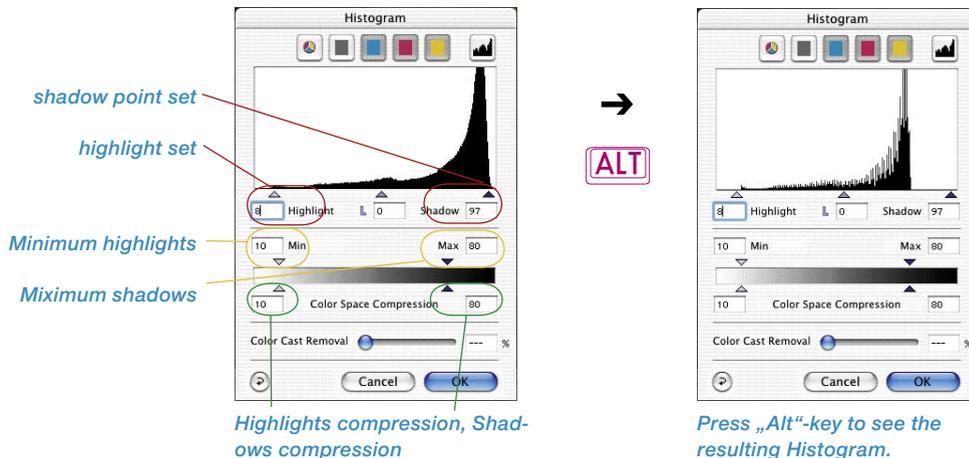
C	18	→	5
M	25	→	5
Y	24	→	5



## Compression of Colour Space in Histogram

In order to adjust the colour space to certain output- or printing requirements, you can compress the colour space in the histogram dialogue.

This does not mean that the source- or scanner-colour space is cut-off, but that the existing tonal values of the scanner are evenly distributed to the compressed scale of the new destination- or output-colour space.



*Highlights compression, Shadows compression*

*Press „Alt“-key to see the resulting Histogram.*

The *SilverFast* histogram is controlled by five significant values:

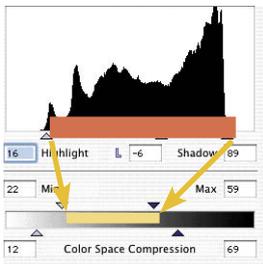
- the absolute 0% value (“specular highlight”),
- white point set (“highlights”),
- midtone value (“midtone”),
- shadow point set (“shadows”) and
- absolute 100% value (“max black”).

Movable triangles controlling the compression are intelligently connected. This assures, values for “highlights-“ or “shadows compression“ never to become smaller than values for “Min“ and “Max“.

## Movable Triangles and Value Fields „Min“ and „Max“

“Min“-, “Max“- movable triangles’ position represent the values for highlights and shadows in the histogram.

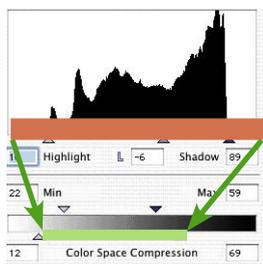
The range between highlight and shadow points set will be projected to “Min“ and “Max“ values for the final scan and should the situation arise be compressed.



## Movable Triangles and Value Fields “Colour Space Compression”

Colour Space Compression triangles’ position represent the absolute values “0%“ and “100%“ in the histogram.

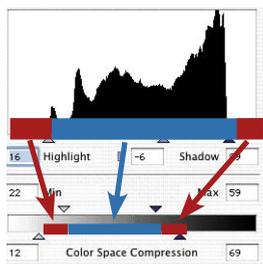
For the final scan the whole range of the histogram will be projected into the colour space range marked by the two triangles and will be compressed accordingly.



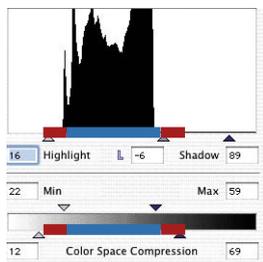
## Final Result

The visible tonal range in the histogram, occurring before the white point (0 to 9%) and after the black point (88 to 100%) will become 12 to 22%, resp. 59 to 69% after the colour space compression.

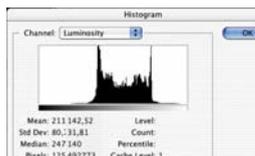
Tonal values between white and black point (9 to 88%) will be projected to Min- and Max-values (22% to 59%).



**ALT**



Pressing the “Alt“ key will simulate the final scan histogram already here.

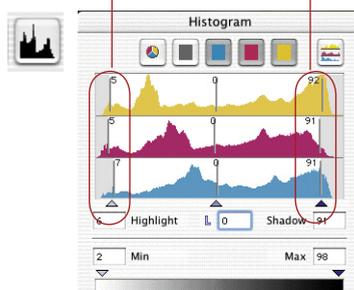


*Resulting histogram in Photoshop*

## Example for Colour Space Compression



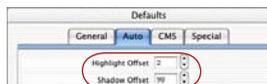
After doing a prescan height and shadow point are manually set with the highlight-shadow triangles in the histogram.



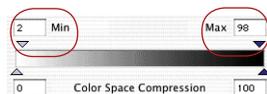
The Position of the highlight and shadow point becomes obvious with position of the outer movable triangles.

These are somewhat inset from the edges of the complete tonal range, here at 5% and 93%.

Highlights and shadows still have detail information visible and are clearly distinct from the specular highlight (0%) and the very black (100%) ab.

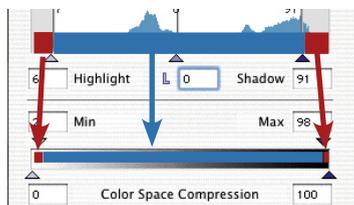


According to the general settings for Min and Max values under OPTION / panel „Auto“ / menu „Highlights at %“ and „Shadows at %“ have been set, the complete tonal range can be compressed for the output.



Values for Min and Max can also be changed for the actual scan frame directly in the histogram dialogue. Both movable triangles „Min“ and „Max“ are serving this purpose.

The example has a min value for highlights set to 2% and a Maxi value for shadows set to 98%.

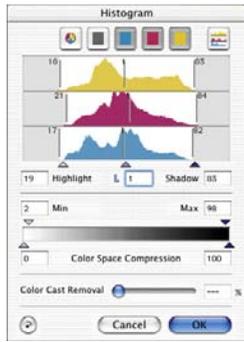


Visible tonal values in the histogram, occurring before the highlights (0 to 5%) and after the shadows (93 to 100%), will become 0 to 2%, and 98 to 100% with the compression.

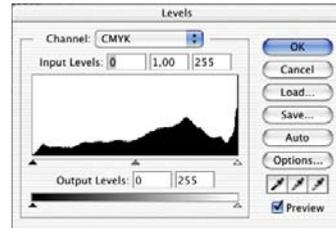
Tonal values between white- and black point (5 to 93%) will be projected in between Min- and Max-values (2% to 98%)

## Compressing Colour Space via Histogram

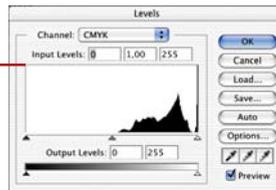
You can see a few examples of colour space compression with the help of the histogram in *SilverFast*:



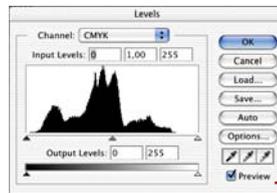
*Colour space without compression*



*Compression to 3-40%*



*Resulting histogram  
(3-40%) in Photoshop*



*Resulting histogram  
(54-94%) in Photoshop*



*Compression to 54-94%*

## Multiple Densitometer (Fixed Pipette, MidPip4)



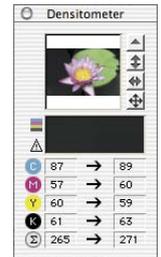
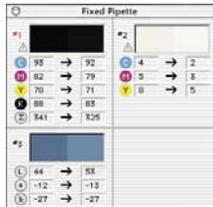
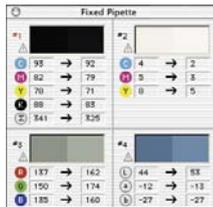
Up to four densitometer measurement points are available in any *SilverFast* plug-in (*MidPip4*).

The measuring values of these pipette measuring points will no longer be shown in the densitometer window, but in their own window. The windows will attempt to adapt to the number of measuring points, meaning they will change their size, depending on the number of fixed points and the selected colour types (RGB, CMYK, grey etc.).

The colour types can be adjusted for each pipette independently of each other.

If all fixed points have been deleted, the window will close automatically. If the window is closed, all fixed points will automatically be deleted.

A fixed point can be created by pressing the mouse key on preview and holding down the “Shift” key as before. If the mouse hits on an existing fixed point, the point will be deleted. If the mouse hits on an existing fixed point and the mouse is moved, the fixed point will be shifted.

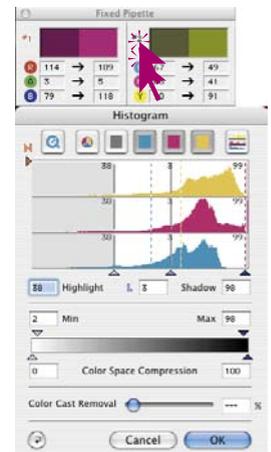


## Displaying the Densitometer Measure Points with the Histogram and Gradations Dialogues



The measurement values of the active densitometer point are displayed as a coloured, vertical line within the open histogram dialogue. They are represented as coloured points on the gradation curve in the respective dialogue.

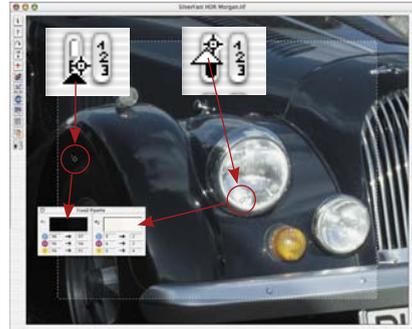
The activation of an inactive densitometer point is done by simply clicking onto it (here Point #2). The respective values are immediately taken into the dialogues.



## Transfer of the Brightest/Darkest Point to the Multiple Densitometer



By clicking the white or black area in the icon for “darkest/lightest point” while holding down the “Shift” key, the reading found by *SilverFast* will be transferred to the window “fixed pipette”. Good control of corner values can thus be assured.



## Selecting the Colour Space in the Densitometer

Hold down the “Ctrl” key and click into any of the measuring value cells of the densitometer. A pop-up window opens and by selecting another colour space the measured values in the densitometer will be converted to the values of the selected colour space. The following colour spaces are available: RGB, CMYK, Lab, CMY, HSL, K and LCH.

Now as before you can select the desired colour spaces by clicking the value display.

