basICColor *input*

Reference Manual

Content

Chapter 1

Preface

1. Preface

Why an owl?

To see sufficiently, even in twilight or near total-darkness, owls have perfectly designed eyes to utilize residual light to a maximum.

The cylinder optics of the pupils and the cylindrical eyeballs remind strongly of the design principle of high speed lenses.

Large lenses with large apertures yield a large amount of light, which is sharply bundled to a small area .

Compared to the human eye, owls achieve a 3 to 10 times better twilight efficiency - even small details can be discerned with high resolution.

The new basICColor input 5 took this perfect blueprint of nature as a model to add to the unsurpassed color capabilities of our new profiling algorithms.

The software for camera profiling can create specific Digital Camera Profiles (DCP) for any camera and any illuminant in high quality.

input 5 distinguishes automatically between RAW or TIFF / JPEG format and creates DCP or ICC profiles with perfect shadow detail.

This guarantees the color correct visualization of these files in all RAW-Converters and image editing applications - for the first time you get identical appearance of the image from RAW-converter and the simultaneously created JPEG of your camera.

The ultimate goal for camera profiling - the exact reproduction of colors - is now possible for every camera owner.

Chapter 2

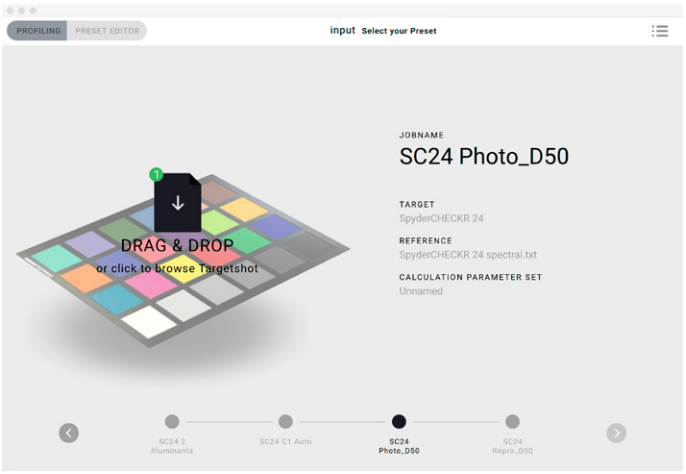
Overview and Quickguide

2. Overview and Quickguide

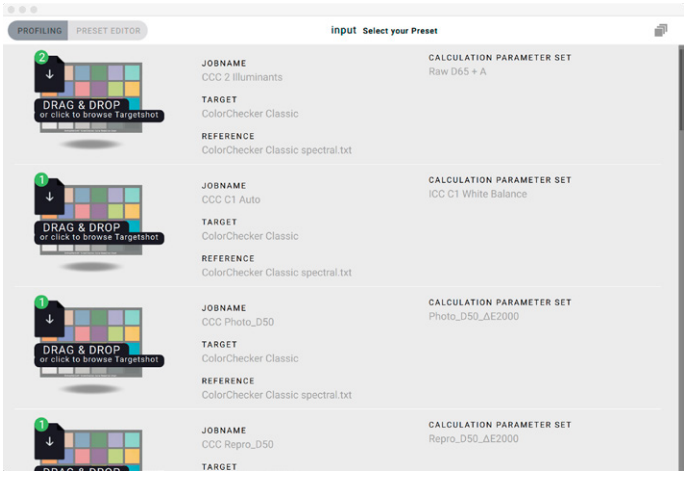
This part of the manual covers the basic handling of basiCColor input. The creation of an ICC-profile for a camera target is shown as an example.

2.1 Selecting a profiling target

Start basICColor input and the preset selection window appears. The application is delivered with a number of predefined presets.

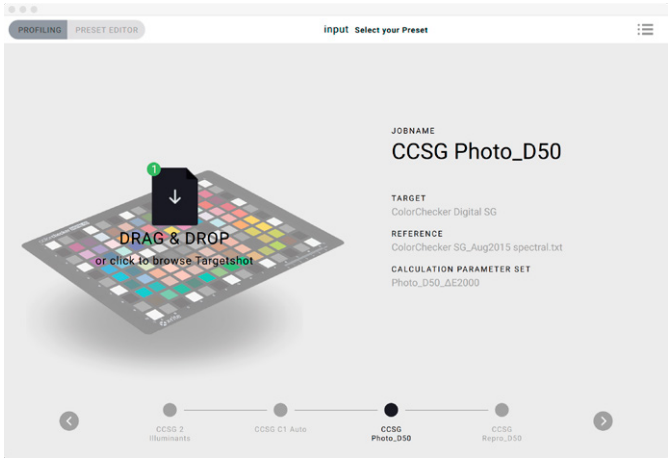


Click the button in the top right corner to switch between the single-target or target-list view. Which view you prefer is up to you, it has no effect on the performance of basICColor input.



In our example we use the default single-target setting for creating the profile.

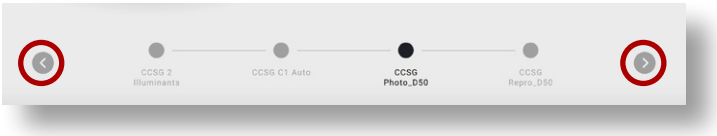
In the top left corner are two buttons where you can switch between the two modes of basICColor input 5. The application starts on „PROFILING“ by default.



The button „PRESET EDITOR“ is greyed-out and not active. Please refer to chapter 3 on how to use the PRESET EDITOR and utilize its functions.

When „PROFILING“ is active, the currently selected preset including the preset information is shown in the main window. The preset informations contains the preset name, the target used, the reference used and the calculation parameter set used for calculating the profile.

A list of pre-defined and available presets is located at the bottom of the main window. The current preset is marked with a black dot, all other presets are shown as grey dots. To directly change to



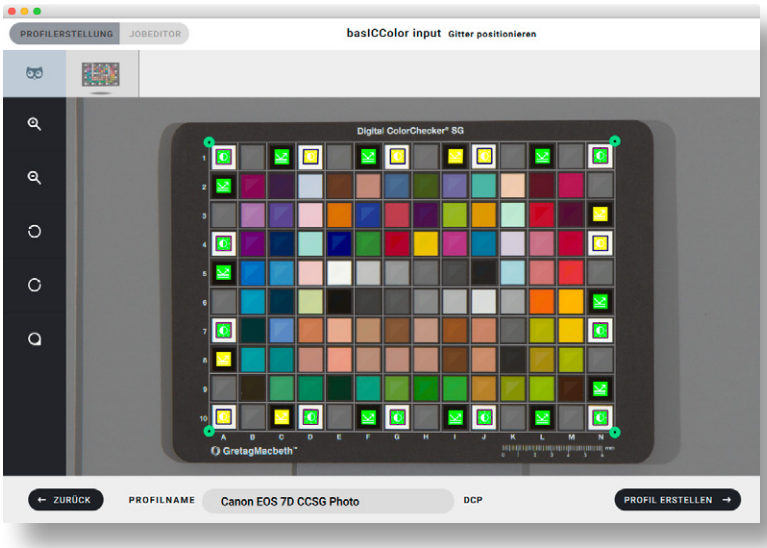
a new preset, click on the „grey“ preset you want or click the left/right arrows to scroll through all available presets.

You can see an animated preview of the currently selected target in the main window. On top of the preview target is a DRAG&DROP area. In the top left corner of the DRAG&DROP icon you can see a small number. This number indicates the amount of targets stored in this preset and therefor how may profiling images are needed

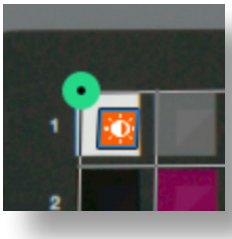
to run the preset. Most presets however contain only one target, mainly Multitarget presets require two or more images.
To create a profile from an image file (TIF-file or DNG for example) simply drag the file to the DRAG&DROP area. Alternatively, click on the DRAG&DROP icon and load the file via the opening dialog.

2.2 Placing the grid

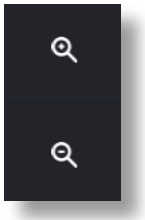
Once the profiling image was dropped to the DRAG&DROP area, basIC-Color input analyzes it and automatically opens the grid-placing window with the underlaying target.



The automatic placing of the grid usually works really well and a manual positioning is not required.



If a manual positioning is needed, simply „grab“ the green markers on the grid corners and adjust the grid.



Zoom
To place the grid corners exactly you can zoom in and out via the magnifier icons in the „Tools“ column to the left.

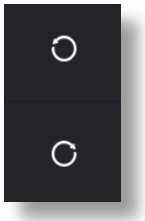
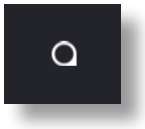
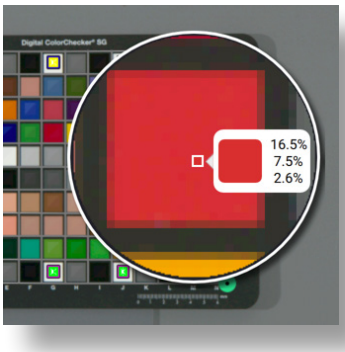


Image Rotation
Turn the target image with the help of the rotation tools in steps of 90°.



Magnifier Tool
Choose this tool to enlarge and view pixel-exact a certain area of the profiling image

See the selected pixel separately in the viewer next to the corresponding color values (in %) in the magnifier.



Furthermore, all grid patches are characterized. Patches, that are used for the profile creation are marked with a small triangle in the top left edge of that patch. Patches that are not used for the profile calculation are crossed out.

Exposure control
Many profiling targets show white, black and/or grey color patches around the edges. These patches are used for the exposure control. Ideally all white patches have next to identical RGB values. This means that the target is evenly illuminated.

basICColor input marks these patches with a square in the following colors:

Red - all patches marked red exceed the defined tolerances

Orange - all patches marked orange are just within the defined tolerances.

Green - all patches marked green meet the defined tolerances

Reflection control

When light falls on a color patch of the target, greater or lesser light is reflected from the surface depending on the material used (matt, silky, glossy, etc.).
This means that if the reflected light of the surface is reflected in the optics of the camera, the color field underneath is brightened. It is important for profiling that virtually no reflected surface light from the target enters the camera optics.
Remedy can be achieved by positioning the light sources differently so that the incidence angle of the light on the target changes and less light is reflected into the camera optics.
For the reflection control, the dark or black color patches of the profiling target are particularly suitable since the effect is most clearly visible on these.
For targets that have white, gray and black color patches around the edge, basICColor input displays a reflection check for the black patches

basICColor input analyzes the black patches around the edge and compares them to one another. The black color patches are then put in relation to one another. In this process, it is evaluated how strongly the black color patches differ from each other. For reference the average value of all black patches around the edge is used.

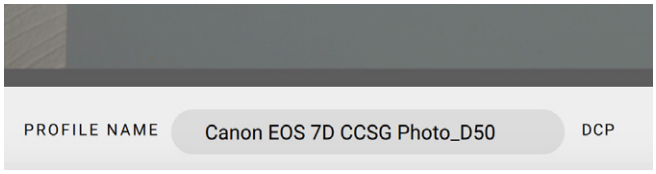
Green - all patches marked green meet the defined tolerances

Orange - all patches marked orange are just within the defined tolerances.

Red - all patches marked red exceed the defined tolerances

Depending on how many of the black color patches are marked with a red icon and what quality you expect of the profile, you should consider changing the illumination of the target so that fewer reflections are present, or that the color patches are more even illuminated.

Profile Name
In the bottom center of the main window you can type in a profile name. By default basICColor input suggests a name consisting of camera/scanner name and the profiling target name

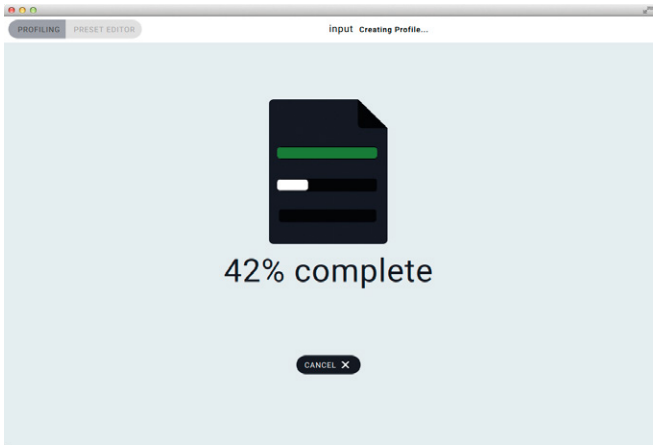


To the right of the input field you can see if an ICC profile or a “Digital Camera Profile” (DCP) is created.

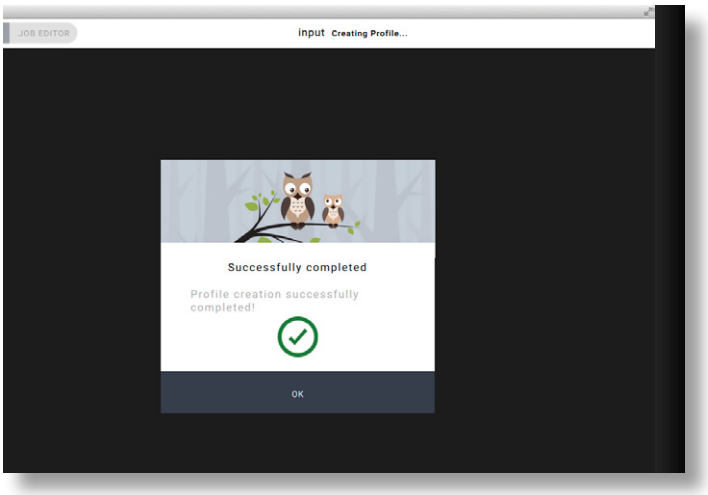
2.3 Calculation and Evaluation

Once the grid is set and a profile name is chosen, click the „Start-Profiling“ button in the bottom right of the main window to start the profiling process.

basICColor input creates the profile based on the loaded image and reference file.



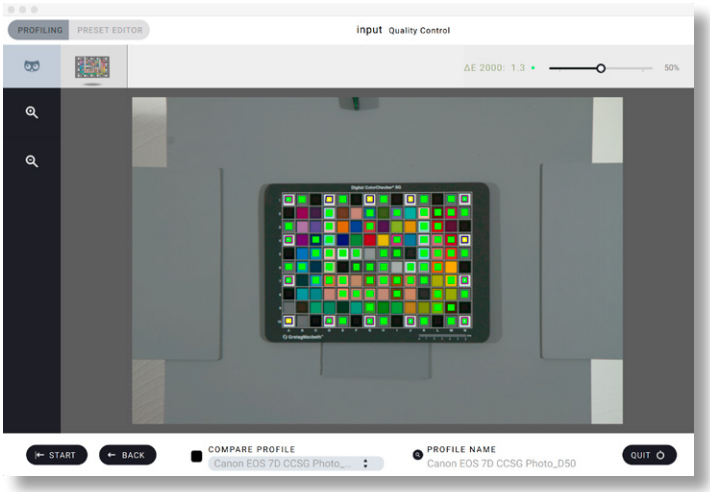
Once the profiling is complete, the profile is automatically stored in the system's profile folder and the user is informed by the status window.



The profile can now be used in other applications.

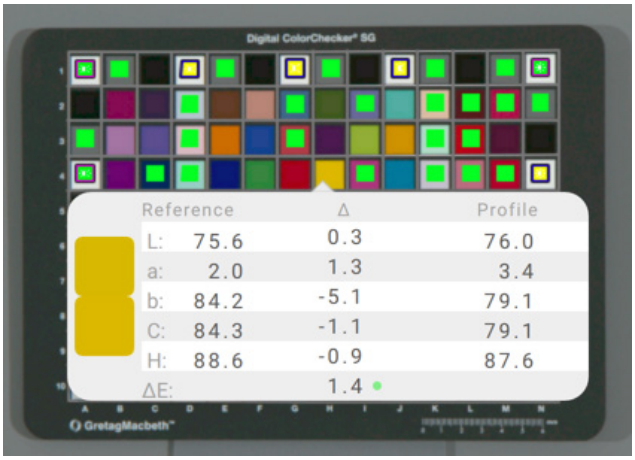
2.3.1 Quantile-Slider

Click on <OK> to access the evaluation window.



The Quality Control window shows the target with the grid again. In the top right corner you can find the quantile-slider.
By moving the slider the amount of patches in percentage are changing that are used for the quality control.
The number to the left of the slider shows the maximum color deviation (in ΔE) of the selected patches compared to the reference.

A red, orange, or green square shows, if the quality control passes or fails. (i.e. the color deviations are within the set tolerances)
This way the user can get a good visual impression in what color areas the profile might cause problems.
Click on a color patch and an information window opens. A detailed list of all calculated color deviations is shown.



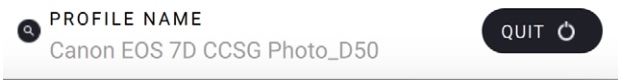
2.3.2 Compare Profile

In order to compare, basICColor input offers the option to allocate an alternative profile to the current target. Selectable are all profiles for the respective camera as well as input profiles of unknown origin, like scanner profiles for example. Furthermore it is differentiated between Digital Camera Profiles (DCP) and ICC profiles depending on the type of profiling target.

With the use of this function it is possible to compare different variations like different profiles or different illumination.

2.3.3 Location of profile

Click on the magnifier icon to the left of the profile name and the location where the profile is stored on the system is shown.



Click the „Quit“ button to close basICColor input

Chapter 3

Preset Editor

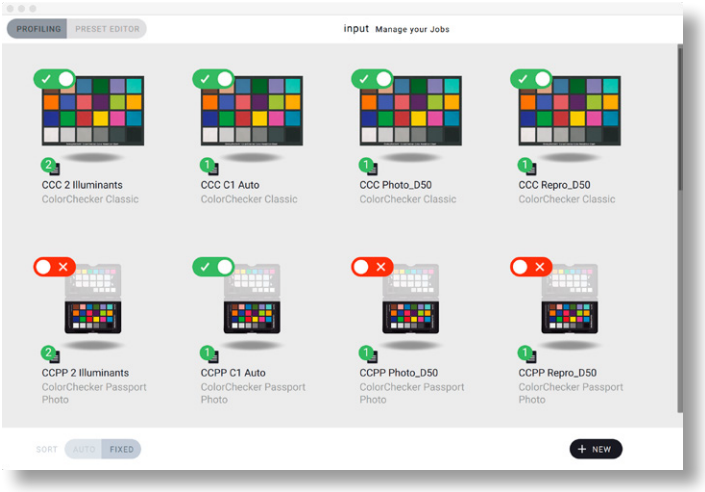
3. Preset Editor

The previous chapter explained the general working principle when creating a profile with basICColor input 5. A predefined preset was used.

This chapter covers the individual creation of presets, the available preset types and what to consider when creating a preset.

3.1 Show/Hide Presets

Open the PRESET EDITOR by clicking the button in the top left corner of basICColor input 5.



The PRESET EDITOR shows all available presets regardless if a preset is active or inactive.

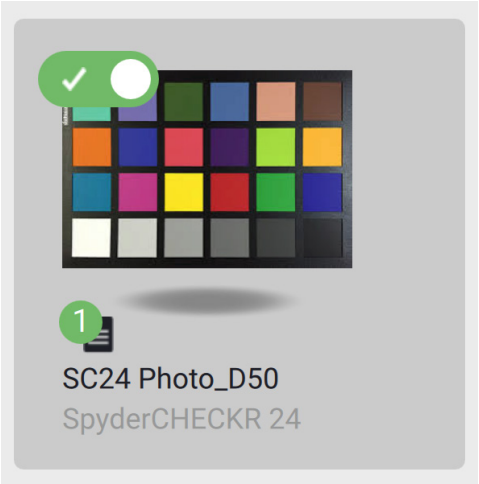
Active presets are marked with a green check mark, the inactive presets show a red X.

Only the active presets are shown when starting the application. This way the application can be customized to your needs easily, just have the presets for which you own targets active.

The button to hide/show the active/inactive presets works like a toggle switch. Click the white circle to toggle the switch.

3. 2 Preset Properties

Every preset has its own information. A preview of the target is shown (in Multicolor presets the target which was selected first

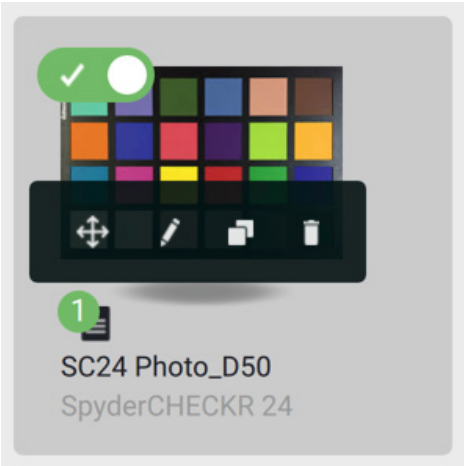


is shown).
Below is a page-icon with an attached green, numbered dot. The number in the green dot indicates the number of profiling targets in this preset.

Underneath the page-icon is the preset name in dark letters and the name of the target (first target name on multi target presets) in light letters.

3.3 Managing Presets

Run the mouse over the the preview target to access the tools.



Edit Preset

To edit a preset click on the pencil-icon. Editing a preset follows the same procedure as creating a preset as outlined in chapter 3.4

Duplicate

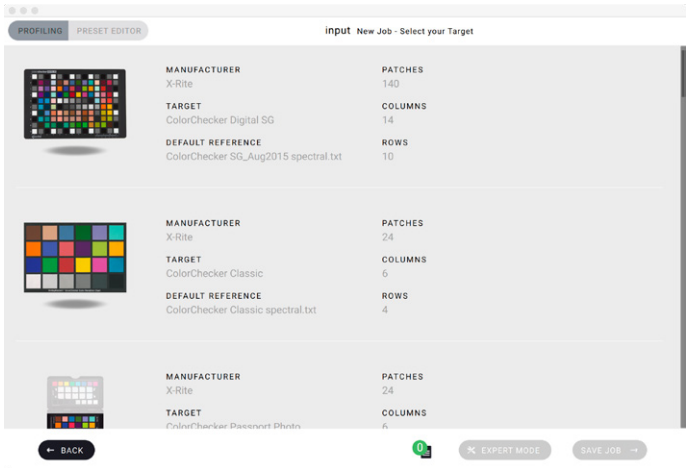
Click this icon to duplicate a preset. basICColor input suggests a duplicate name or you can rename the duplicate.

Trash

Click to delete the selected preset. Once the deleting is confirmed basICColor input deletes the preset without further warning. The deleted preset cannot be restored.

3.4 Create a new preset + NEW

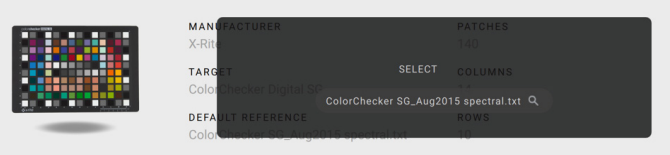
To create a new preset click the button on the bottom right edge of the PRESET EDITOR window.
A list with all available profiling target appears.



In the left column are previews of each target. The second column shows target-name, manufacturer and the standard-reference for this target. The last column contains detailed target information (number of patches, rows and columns)

3.4.1 Target Selection

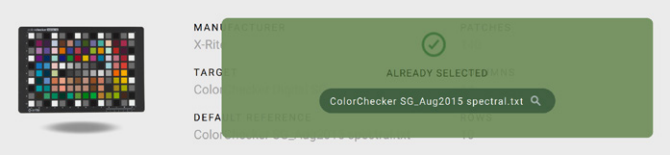
To select a target run the mouse over the second or third column of the wanted target. The „Select“ window opens. With a click on the „SELECT“ window the target is selected for the new preset.



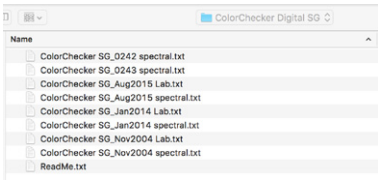
Once clicked the „SELECT“ window turns red and if you move the mouse off this particular target it turns green. This symbolizes that the selected target is integrated into the preset.

3.4.2. Reference Selection

Every target has a standard reference file. This file is automatically selected when choosing a target. If you want to change the reference file for this target in the preset click on the current reference file name, highlighted in dark green.



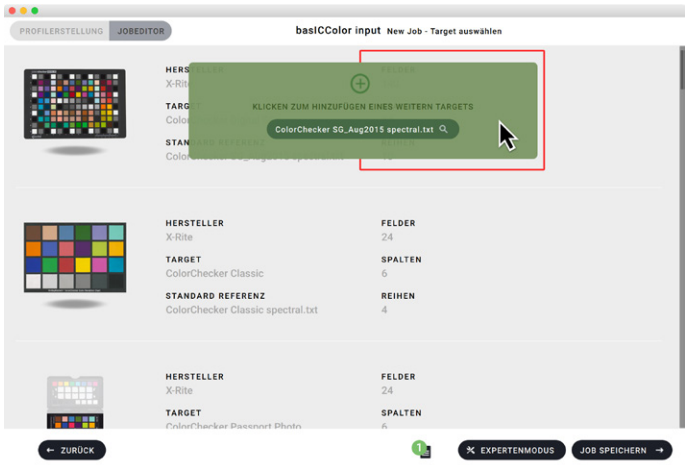
The folder with all available reference files for this target opens.



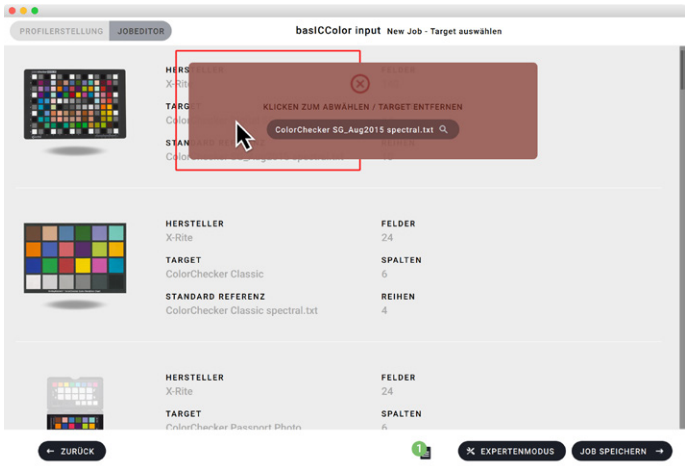
Note: The folder with the reference files is in the jobs folder of basICColor input.
Mac OS X : Macintosh HD/Users/Shared/basICColor Jobs/basICColor input 5/templates/references
Windows: C:\Users\Public\Documents\basICColor Jobs\ basICColor input 5/templates/references

3.4.3 Multi Target

With basICColor input 5.2.2 and higher, it is possible to add a target several times to a job in order to average captured images or scans for profiling. To do this, move the cursor over the right area of the selected target and in that moment the displayed text changes from „ALREADY SELECTED" to "CLICK TO ADD ANOTHER TARGET".

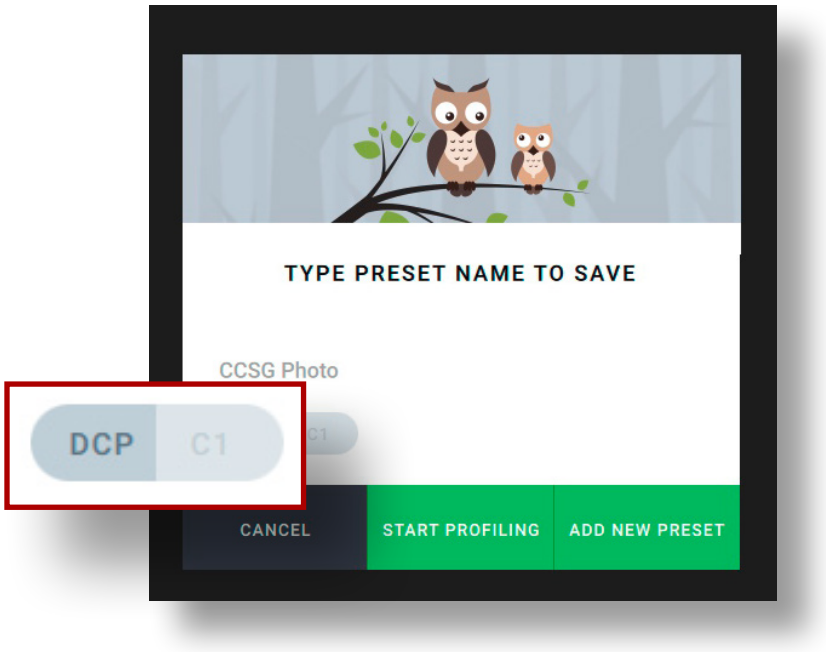


A click now adds another target to the job. If you move the cursor over the left area, the color of the selected area changes from green to red and the text to "CLICK TO DESELECT / REMOVE TARGET". A click now removes added targets or deselects the target if there are no more targets available.



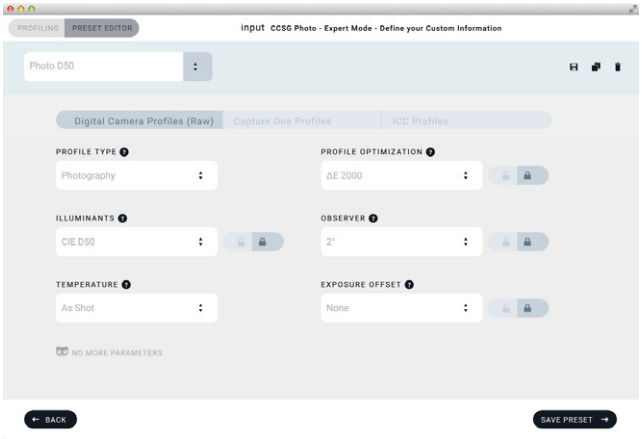
3.4.4 Save Preset

Selecting the reference file finalizes the creation for a new (Multi-target) preset in a normal case. Click the „SAVE PRESET“ button at the bottom edge of the target selection window an enter a new preset name in the following dialog. Choose „START PROFILING“ or go back to the target selection list with „ADD NEW PRESET“ or chancel this preset creation altogether. Once a preset is created with „START PROFILING“ or „ADD NEW PRESET“ it is shown in the list of presets.



3.5 Expert Mode

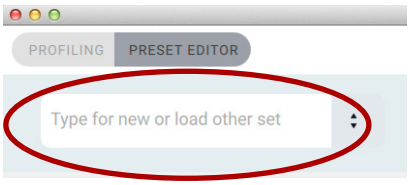
The Expert Mode is the technical core of basICColor input. Here it is defined what criteria and methods are used when creating a profile with basICColor input. In the main window of the Expert Mode the main parameters can be defined. It can be determined if certain parameter can be adjusted by the user or if the full profile creating process shall be done without any input of the user.



It is important to know that basICColor input differentiates between the workflows of Digital Camera Profiles (DCP) creation, creation of ICC profiles from RAW images for Phase One's Caputre One software and creation of ICC profiles from TIFF and JPEG images. The main window offers a tab for each model. The setting options are always assinged to all three workflows in a preset.

All three settings can be saved together as a selectable preset, so these preferences can be loaded in other presets quickly.

Start out with giving the preset a new name in the input field located in the top left corner of the main window.



Save the preset with a click on the disc-icon located at the bottom of the main window. By a click on „SAVE PRESET“ the preset is saved but no selectable preset for the preferences is created.

Lock Settings

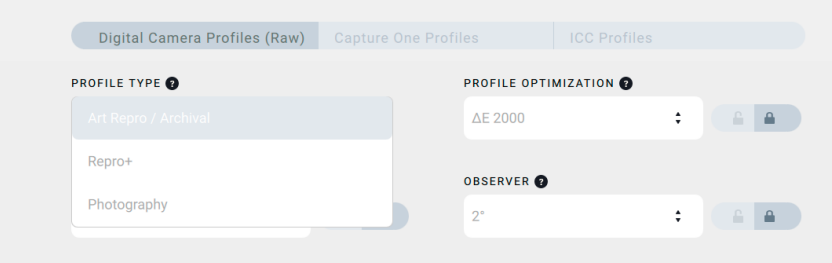
Next to most settings is a lock-icon. By clicking the icon the selected setting can be locked and the user cannot alter a setting for profiling and/or this options hidden respectively. This way the UI can be kept clean and the user gets to only see the relevant settings.

3.5.1 Tab Digital Camera Profiles (RAW)

The main characteristic of a Digital Camera Profile (DCP) is that it affects the color behaviour of an image in a workflow much earlier than an ICC profile.
The color matching calculation considers the behaviour of the camera sensor and the lighting situation also. This happens so early in the workflow that the setting of the color temperature and the global adjustment of the image brightness do not matter for the calculations.
However, both adjustments can be considered or adjusted,

Therefore basICColor input offers the following preferences:

PROFILE TYPE
basICColor input offers three profile types for different aims.



Art Repro/Archival
Our goal here is to obtain a colorimetric match, which we can only get if we can turn off Adobe's non-linear lightness correction. We achieve that by embedding a curve in the profile. This curve will mostly be very close to linear, but simply its presence gives us a completely different color reproduction. ACR's "trimming" will result in a darker image than we want, but we can now achieve our final result by linearly scaling the RGB values using Levels after the Raw development in the RGB working space.
Images, that are exposed with this setting, appear darker when they are processed further in an image editing program after being exposed without exposure correction. This has to do with the fact that through the correction curve of Adobe Camera RAW an automatic exposure suppressed. However, precisely this automatic exposure of ACR would destroy the colorimetric accuracy in the profile, therefore this effect is intentional.

When the white point in the image editing program is adapted after the RAW exposure then the colorimetric precision is kept and spread correctly over the full brightness.

This profile type is primarily for workflows where a particular colorimetric precision is wanted when developing RAW images.

Repro +
Compared to the method “Repro / Archival”, this method works with the correction curve embedded in the ACR. Thus, the ACR correction curve is applied on the reference data so that the data is displayed correctly in ACR or Lightroom again.
Compared to the “Repro / Archivierung” method no correction of the white point in ACR is necessary at a later stage.

The disadvantage of this method is that although the color data is handled colorimetrically correct, but the dynamic scale of the shot is adjusted by ACR automatically and thus the colorimetric precision on the brightness axis is slightly changed. Usually this is not a disadvantage.

Photography
In this method no correction curve is written into the profile. The automatic exposure correction of Adobe Camera RAW works and the captured image has the widest possible contrast range.
This profile type works for most photographers, it provides punchy yet color corrected RAW development.

ILLUMINANTS
The Lab color system refers to the standard light D50 by default. The colors are corrected so that they are displayed correctly in a D50 lighting condition.
However, if one knows that the color data will be viewed in a different lighting condition, then it can be altered in preparation using this setting.

Example:
One already knows when recording that the created images will be viewed in an environment that uses fluorescent lamps as the light source (in a museum for example), then a color adjustment can be made at this stage already.

If a different illuminant (other than the standard D50 lighting condition) is selected at this point then it has to be adjusted throughout the whole following process (i.e. monitor, printing system etc.)

Note: Illuminant adjustments take effect only if the chosen target reference file contains spectral measurement data.

Color Temperature
It is very important to know the lighting conditions in the RAW workflow, i.e. with what light source (illuminant) was the scene illuminated?
A Digital Camera Profile works only ideally if the camera white balance was done with a grey-card and the image was then taken with this grey balance.
For profiling, it is therefore relevant whether an image was taken in daylight or under artificial light because the spectra of different light sources differ in part considerably.
Therefore it is obvious, that for every light source a Digital Camera Profile must be created.

As shot
In this method, the white point/illuminant recorded/determined by the camera is used from the RAW file. A white balance with the use of a proper grey card (basICColor grey card for example) is a must before taking a shot of the profiling target

D65 + std. Illuminant A (Dual Illuminant)

Adobe Camera RAW interpolates the color temperature of an image of two different light spectra. To create a profile with dual illuminant two shots of the profiling target with the same camera are required: one shot of a warm light source (for example, incandescent light) and a second shot of a cool light source (for example, cloudy daylight).

This way mixed light conditions for example are compensated in Adobe Camera RAW by interpolating between the lighting conditions in order to determine the appropriate color temperature.

Exposure Correction

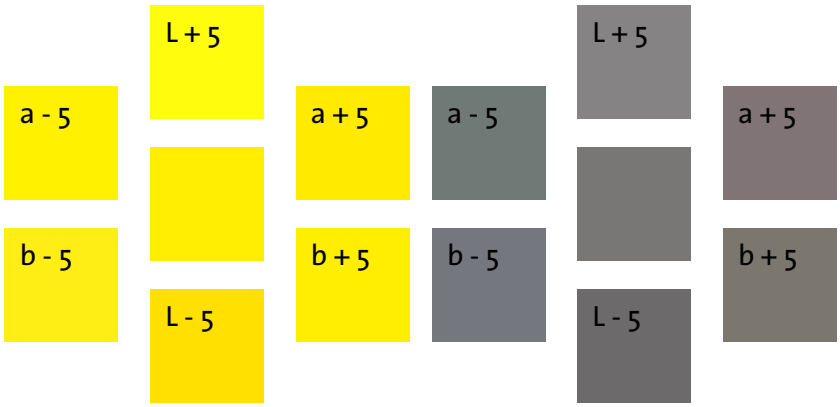
The use of exposure correction is primarily appropriate when „Art Repro/Archival“ was chosen as the profile type, because with this type of profile the white point must be adapted to scale the image to the full dynamic range .

A correction is possible in half aperture levels. Select an appropriate correction level to adjust the exposure.

Profile Optimization

The Lab color space is currently the color space that best represents the human color perception.

Unfortunately, this color space is not perceptually equidistant and human color perception varies to different degrees, depending on the color location and direction of the color change. Taking yellow as an example, the human eye perceives a change in the hue angle towards green or red and a change in brightness stronger than an equal change in color saturation.



The color perception of individuals is particularly sensitive on colors near the gray axis . Even small shifts in color saturation and hue angle are perceived as strong change .

The different color deviation formulas try to include human color perception into the calculation and also to take particularities of color perception into account.
Generally speaking, the more modern a formula is, the more precisely the calculated values match the human color perception.
The color deviation formula CIE ΔE76 contains no corrections and returns the absolute color difference . All other formulas contain appropriate correction factors. For detailed explanation of the structure of these formulas please refer to relevant literature.
For profile optimization in basICColor input we recommend to use the ΔE 2000 formula.

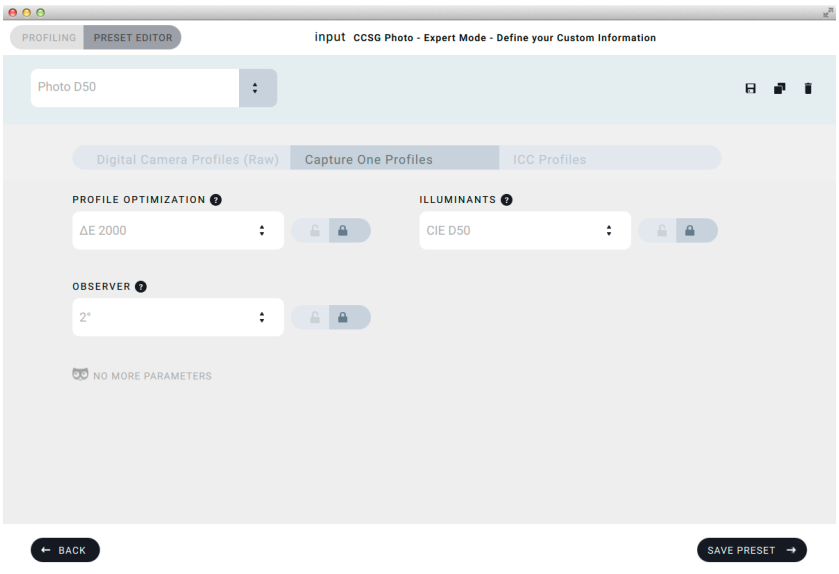
OBSERVER
Depending on how much space of our visual field is taken by a color area is perceived the human eye differently.
This behavior is considered by the viewing angle of the so-called "normal observer" during color conversion.
.
Relative small, rather point-like color areas are perceived as 2° "normal observer".
For color areas that cover a large part of our visual field the perception presents the 10° "normal observer"

Example:
A billboard is to be printed. It must be considered that the colors on the monitor tend to be seen as a 2° normal observer compared to standing directly in front of the large format Poster - it's rather perceived as the 10° normal observer.

Usually it is impossible to estimate how close a viewer will be standing in front of an object. In general objects are mostly viewed from some distance. We recommend to use the 2° observer setting by default.

3.5.2 Tab Capture One Profile

basICColor Input ICC profiles that are created for use in Capture One software use the Lab color system as a PCS. This is in essence the main difference to profiles which are used for the conventional ICC workflows.



PROFILE OPTIMIZATION

Please refer to profile optimization in capter 3.5.1 Tab Digital Camera Profiles (RAW) on page 23.

OBSERVER

Please refer to information regarding OBSERVER on page 27.

ILLUMINANTS

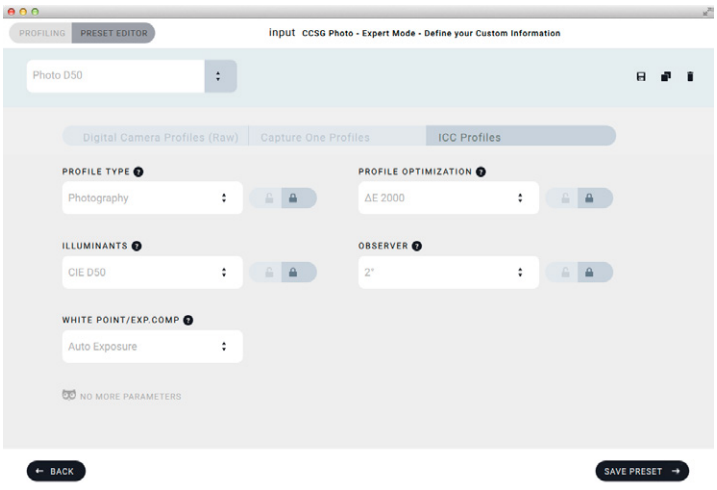
Please refer to information regarding ILLUMINANTS on page 24 and following.

3.5.3 Tab ICC Profiles

The ICC profiles are so called „output-related“ color profiles. This means that the development of the RAW image has to be complete prior to the ICC profiling. But this also means that all RAW images of a series have to be developed with the same settings so that the ICC profile stays valid. As soon as one RAW image is developed with a different setting, the ICC-profile loses its validity and the data is no longer color correct.

PROFILE TYPE

basICColor input offers 4 types of profiles for the profile creation.



Art Repro / Archival

This option offers the most accurate colorimetric color reproduction. The gray balance of the image is maintained. If there is a cast in the image it is kept and not corrected.

Photography

This type of profile provides a colorimetric accurate color reproduction. In addition the gray balance is adjusted in the image to achieve neutral color values (RGB = 242/242/242 for example) in the gray areas.

Scanner

The routines have been optimized primarily for creating ICC profiles for scanners.

Grayscale

This profile type was developed especially for scanner profiles. A normal ICC profile is created and after profile creation, the a* and b* values in the LUT are set to "0" (ZERO). This results in a very nice grayscale profile. Note: the colored squares in the quality control window after creating the ICC profile are not significant!

ILLUMINANTS

Please refer to information regarding ILLUMINANTS on page 26 and following.

WHITE POINT/EXP.COMP

basICColor input offers two settings for the white point:

None

Use this setting if the profiling target was photographed in ideal lighting conditions.

In many cases it is assumed that the white point in the image (the whitest patch on the target) has a RGB value of about RGB = 250/250/250 and the black patch of the target of about at RGB = 20 /20 / 20.

These are the ideal working conditions for the creation of a profile. If an underexposed or overexposed image is used for profiling, the requirements for a high quality profile are not met.

basICColor Input nonetheless tries to create a high-quality profile.

Auto Exposure

By using this option basICColor input first analyzes the target shot and determines whether it is over- or underexposed. Should this be the case basICColor input makes an automatic exposure adjustment and creates the ICC profile on this basis.

PROFILE OPTIMIZATION

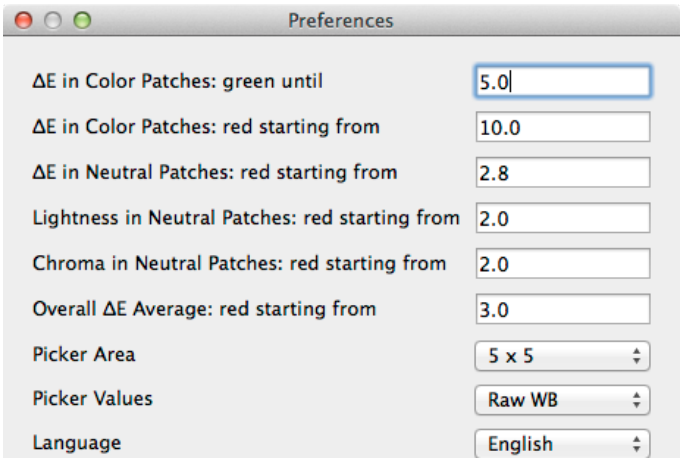
Please refer to profile optimization in capter 3.5.1 Tab Digital Camera Profiles (RAW) on page 25.

OBSERVER

Please refer to information regarding OBSERVER on page 29.

3.6 Preferences

Access the preferences to determine the tolerance values via „<cmd>+“ on Apple computers or „<strg>+“ on Windows computers. Alternatively open the preferences via the menu of basICColor input. „Main menu -> basICColor input -> Preferences“ for Macintosh and „Main menu -> Edit -> Preferences“ for Windows operating systems.



3.6.1 Tolerances for quality assurance

Set the tolerances for the assessment of the color differences here. The parameters set here are used in the evaluation of patches for quality assurance.

Picker Area

To display the color values in the magnifier tool, this setting determines the range over which the average is calculated. Unit = pixel.

Picker Value

The visualisation of the color values in the magnifier tool can be changed to raw camera values using “Raw”. In the default mode “RawWB” (WB = WhiteBalance) developed values are displayed. With “Raw”, the zoomed image section is visualized “RAW”

3.6.2 Language

Select the operating language for basICColor input here.

Chapter 4

Workflow in Photoshop, Capture One and Lightroom/ACR

4. Workflow in Photoshop, Capture One und Lightroom/ACR

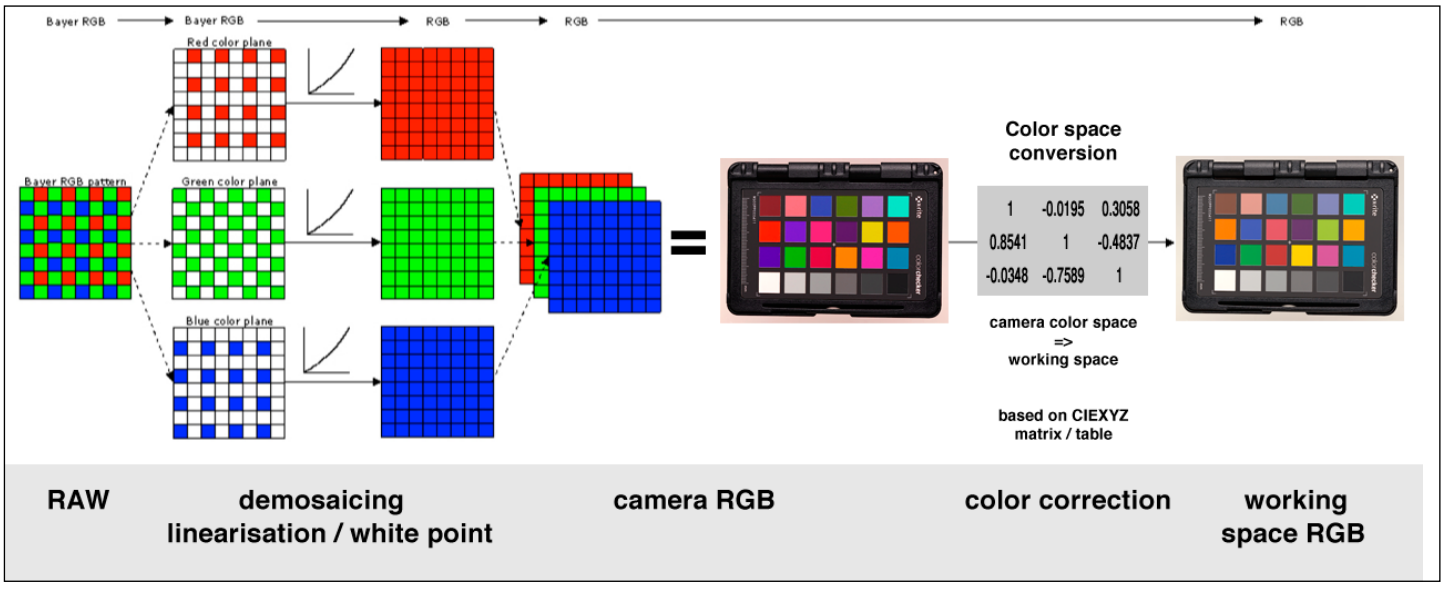
4.1 ICC- and DCP-profile

ICC profiles are used widely, in Photoshop, several RAW-converting applications (Capture One for example) and also in scanner applications. DCP-profiles on the other hand are used in Adobe RAW converters (Adobe Camera RAW / Lightroom / Bridge). Because DCP-profiles (Digital Camera Profile) were developed around the DNG-format of Adobe, they are known as DNG-profiles also.

4.1.1 Working principle/ Creation of ICC-profiles

ICC profiles are designed for the color conversion in the workflow only. The demosaicing - the actual RAW conversion - happens earlier. Basis for the calculation of an ICC-profile is therefore a developed file in the camera-RGB-color space with correct exposure and correct set white point (RAW-workflow: TIFF 16 bit, JPEG-workflow: JPEG 8 bit)

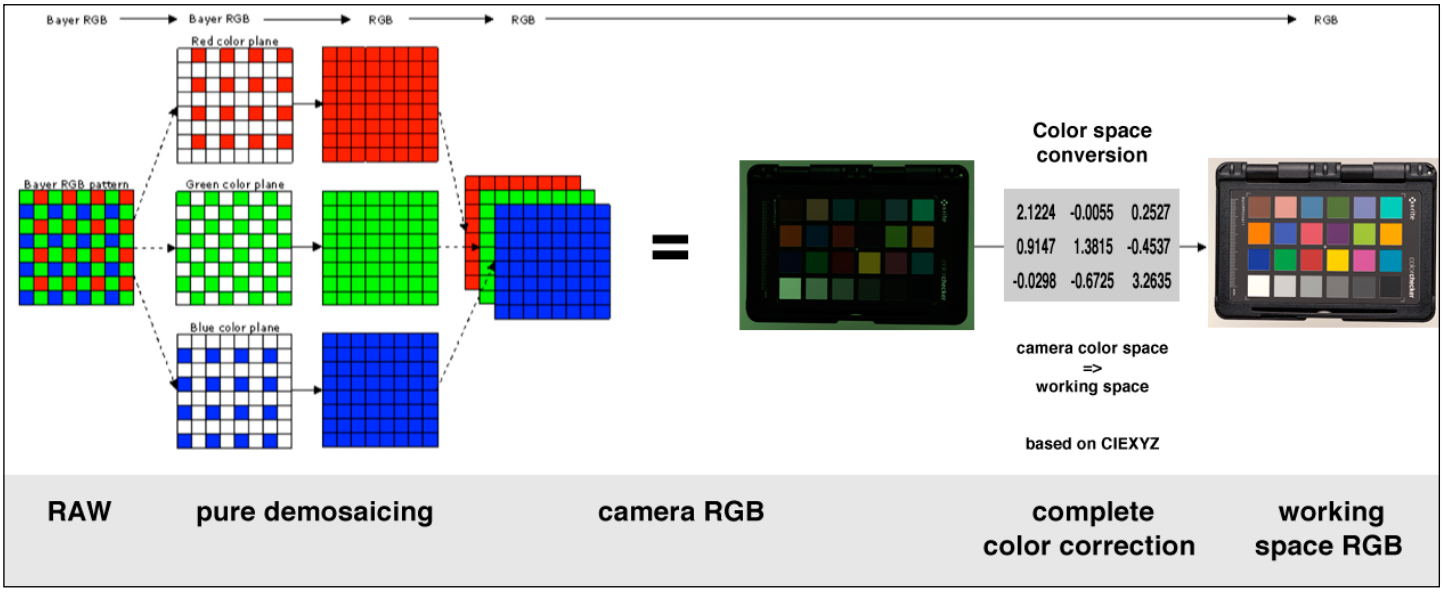
The process is split, similar to a printing processes: a pre-processing (linearization / white point) followed by a 3-dimensional color correction (ICC-profile). Therefore it is possible to save and employ an interim result - a “calibrated“ camera RGB with an embedded camera profile - in an ICC-based RAW workflow (16bit or 8 bit). This is not possible in DCP workflows.



4.1.2 Working principle / Creation of DCP-profiles

In a DCP workflow, the first processing step is purely restricted to the demosaicing. Only one color conversion occurs in the workflow which does all color adjustments in one calculation. The basis for this calculation method are today's high bit-depth RAW data. Therefore in DCP workflows, only the output is provided in working spaces.

The basis for the calculation of DCP profiles is therefore a RAW or DNG file. You can directly load the RAW files of compatible cameras in basICColor input 5. If you want to change the white balance set on the camera or if your RAW files are not recognized or show unusual results in the profiling, then open your RAW files in Lightroom and ACR, and convert them to DNG before loading them in basICColor input 5.



4.1.3 Paths to profiles

ICC Profiles:
MAC:
HD/Users/User/Library/ColorSync/Profiles

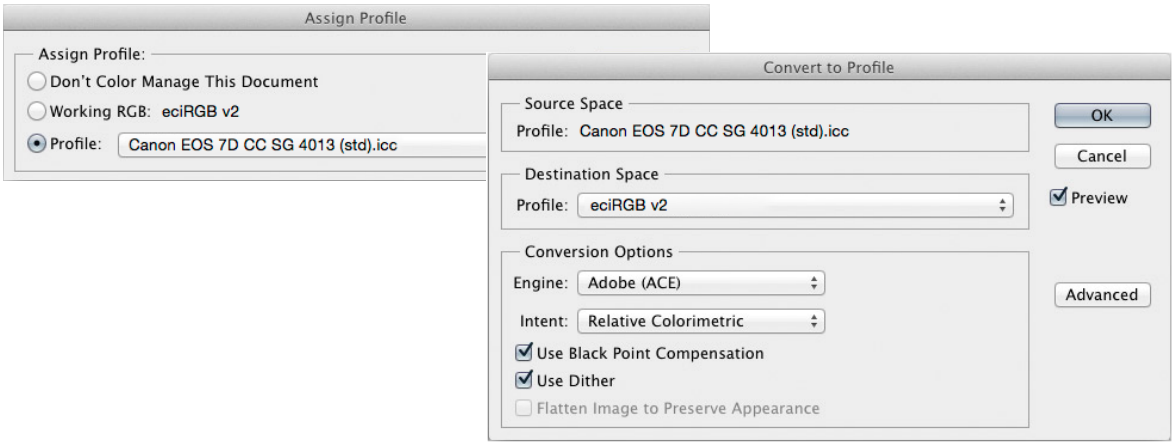
PC:
C:/Windows/System32/Spool/Drivers/Color

DCP Profiles:
MAC:
HD/Users/User/Library/Application Support/Adobe/CameraRaw/CameraProfiles

PC:
C:/Users/User/AppData/Roaming/Adobe/CameraRaw/Camera-Profiles

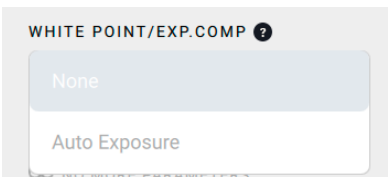
4.2 ICC-profile in Photoshop / JPEG-workflow

Managing camera profiles in Photoshop is straightforward. In a JPEG workflow, the camera creates a finished RGB file, without access to the internal processing. Post-process the file in Photoshop by assigning a camera profile first (Menu: Edit - > Assign Profile ...) and then convert the file to the wanted work/storage color space (Menu: Edit - > Convert to Profile ...) .



To create an ICC profile, shoot a profiling target with the same color space setting that you use for the production shots. Most cameras offer sRGB and Adobe RGB, some (for example Leica) also eciRGBv2. For the largest possible color gamut of the largest color space should be used (eciRGBv2 or Adobe RGB). For the best possible tone value reproduction (JPEG = 8 bits) use the same color space that will be used for the finished processed file.

Load this image in basICColor input 5 and create an ICC profile. Use the manual white balance of the camera for the profiling shot if possible. Be sure to use a metamerism-free gray card and pay attention to a proper exposure.



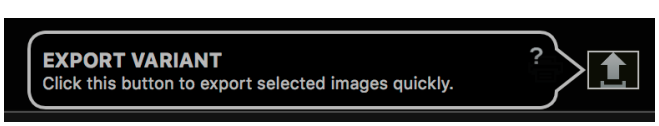
For the profile calculation you can then use both white balance settings. With „None“ calculated profiles take your white point and exposure (for example, a selective underexposure for more editing reserves in the highlights) into account and correct it without tone value loss during profile assignment in Photoshop. If white balance and exposure of the target shot are not perfect, select „Auto Exposure“ for an automatic correction of the shot prior to the profile calculation.

4.3 ICC-profile creation for Capture One

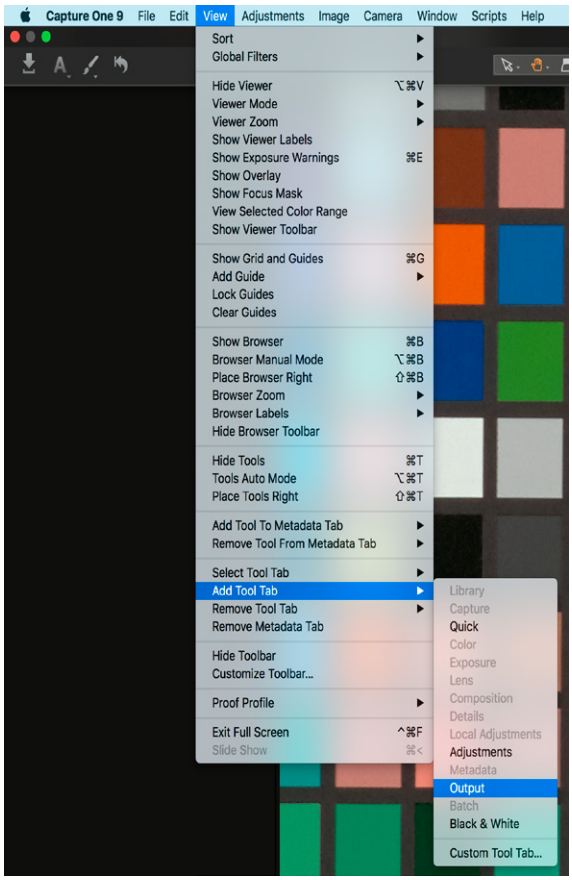
Capture One, software by Phase One is a widely used ICC-based RAW converter. The profile creation follows the general principle of ICC profiles, but basICColor input 5 provides some additional settings for Capture One (short: C1).

4.3.1 Presets of C1

Capture One provides several ways to export data. For profiling you need a 16bit TIFF in the camera color space („Embed camera profile“). In the Quick Export-dialog of C1 (version 8.x and 9.x) this option is available but unfortunately it is reset during data export.



IMPORTANT : Use Quick Export of C1 exclusively for production data (working color spaces : sRGB , Adobe RGB , eciRGB v2 , ...)
Do not use for profiling (embed camera profile)!



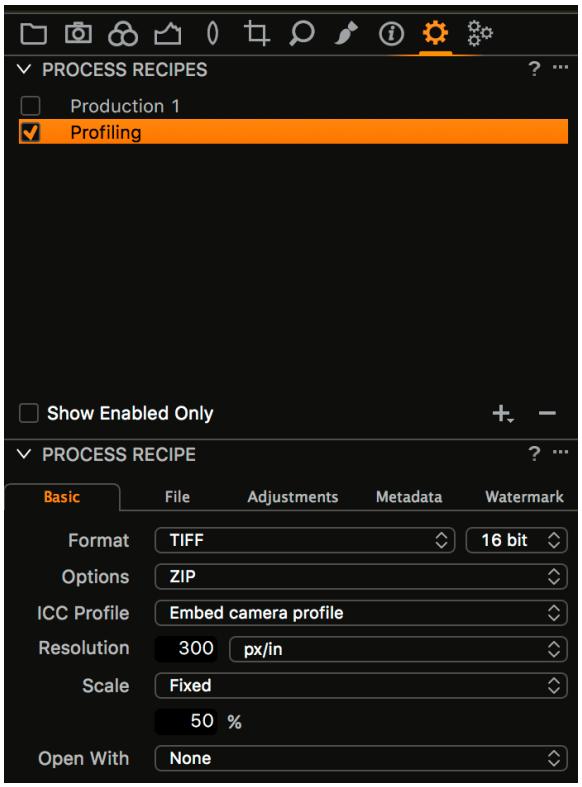
For the export of a profiling target image use the “Output“ tab.

In the standard configuration of C1 v8.x/ v9.x the “Output“ tab is often not visible. Open it via the menu (View > Add Tool Tab > Output).

We recommend keeping the “Output” tab visible, since file export settings are specified here and the selected output ICC profile determines the RGB values shown by the Cursor Tools.

4.3.2 Export the target-image

Go to the “Output” tab and set up a process recipe for camera profiling.

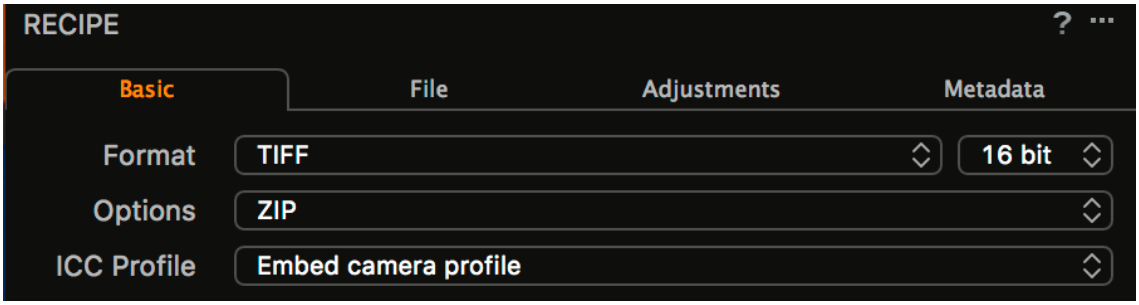


Setting the output ICC profile to “Embed camera profile“ is especially important.

This ensures that the camera RGB values which are required for profiling are written without conversion to a working color space in the file.

Please select TIFF 16 bit as file format.

To keep the file size small, you can activate the ZIP compression. Depending on the sensor resolution of your camera, crop the file and re-size it smaller. The calculation of ICC profiles does not require extremely high resolution.



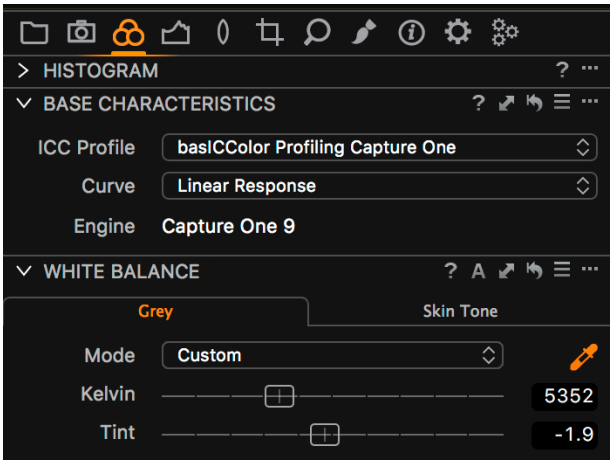
Activate (check-box) AND select (highlight) your profiling process recipe.

Only when this process recipe is selected will the correct camera RGB values for exposure control be shown by the eyedropper or other cursor tool moving over the image.

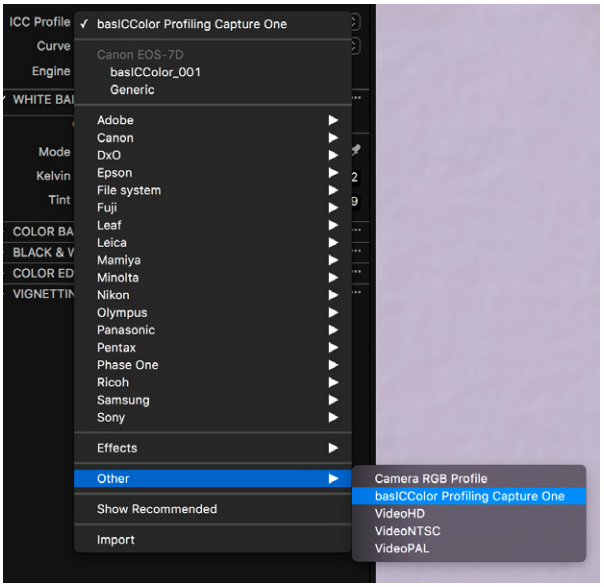
If you have selected a processing specification that converts into another working color space (for example, sRGB , Adobe RGB , eciRGB v2 , ...) the eyedropper shows RGB values that are converted via the active camera profile into the selected output color space

In the Image Browser, select the image of your profile target with which you want to calculate an ICC profile. The correct exposure should show camera RGB values of approximately 245-250 on the white patch of the profiling target.

The visual appearance is not important, because it's done via an old existing profile - the new profile is yet to be created. However, uniform illumination is critical. Check this with the eyedropper. The variations should be under ΔRGB = 5.



Now go to the "Color" tool tab. If you have already carried out an individual white balance in the camera using a metamerism free gray card, you can set the White Balance Mode to "Shot".
Otherwise, click with the White Balance eyedropper tool on your gray reference in the target image (gray card, gray CaliCube , a gray reference field , ...). The White Balance Mode field will show "Custom".

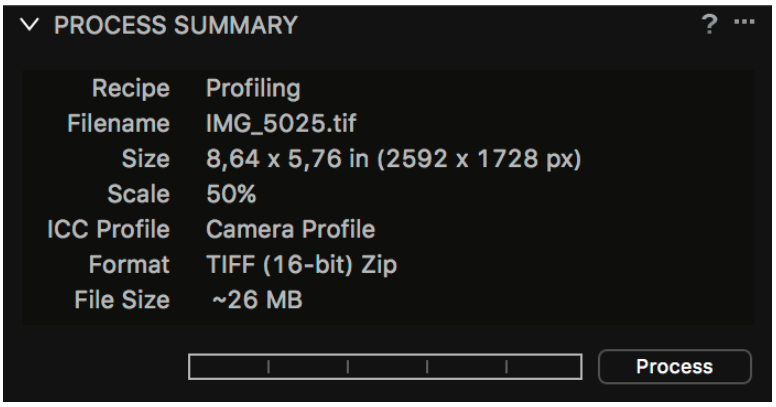


Now in Base Characteristics, select "basICColor profiling Capture One" for the ICC Profile. You will find the profile drop-down menu under "Other".

The ICC profile works only as a spacer in basICColor input 5 - it's only needed to identify the TIFF file automatically as a C1 - profiling image.
It does not change the camera RGB values. The screen apperance changes and signals the selection of the image for profiling .

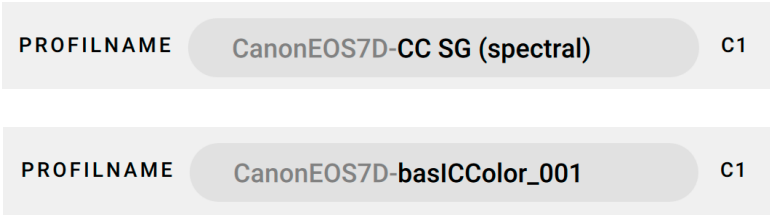
Profile creation is possible with any of the options for "Curve". But it is essential to use the same Curve setting when applying the profile that was used when creating the profile. For the most linear behavior of your images / profile use the "Linear Response" setting, if you work with "Film Standard" then make a profile for that as well.

Now go to „Process Summary„. Check if the correct processing specification is selected and click „Process“ to export the TIFF file .

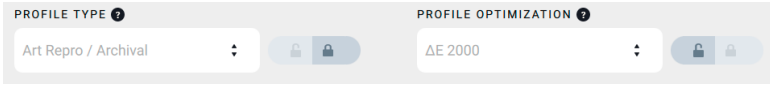


4.3.3 C1-Parameter in basICColor input 5

Load the from C1 exported TIFF file in basICColor input 5. The program recognizes the TIFF file automatically as a C1-file and shows this next to the suggested profile name.



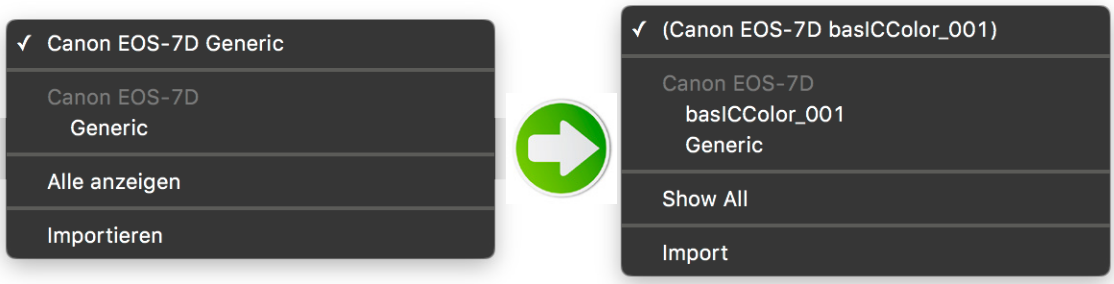
The first part of the profile name is assigned automatically and can not be changed . It is required by C1 to assign the ICC profile to the corresponding camera model. The second part can be edited freely. Suggested is the name of your selected preset, or enter a desired name.

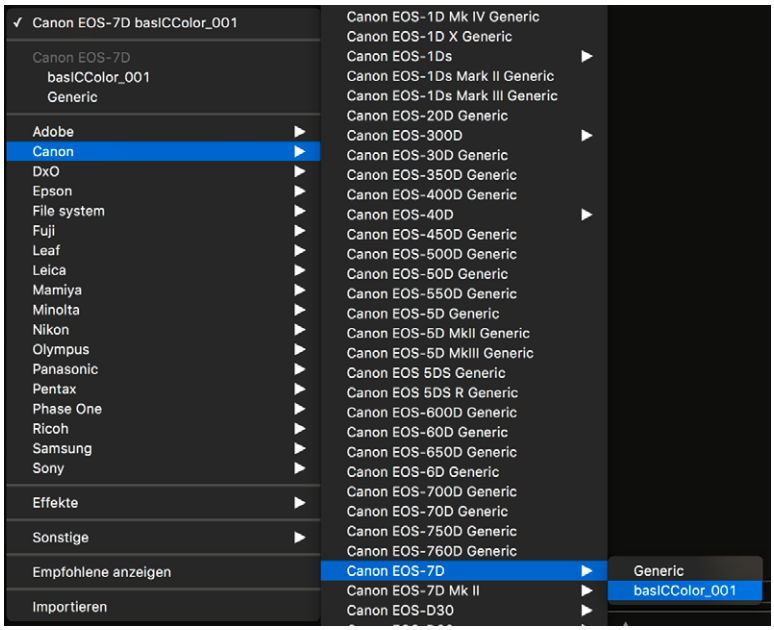


Select more parameters for the profile calculation in the next screen. You can choose as long as the settings are unlocked in the expert preferences. The profile type „C1„ selects L*a*b* as the PCS of the profile and a calculation algorithm that optimizes the ICC profile for the color management tools of Capture One .

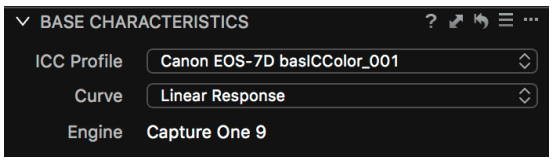
4.3.4 Using the profiles in C1

After calculating a new profile Capture One must be restarted so that it can access it. basICColor input 5 stores the profiles so that they are assigned automatically to the corresponding camera by Capture One. You can find the new profiles for your camera after restarting C1 in the profile list to match the selected image, as well as in the complete profile list, filed under the appropriate manufacturer and model of camera.





IMPORTANT:
When applying the profile, please ensure to always use the same curves-adjustment as for profiling. Only then can the ICC profile-work correctly.



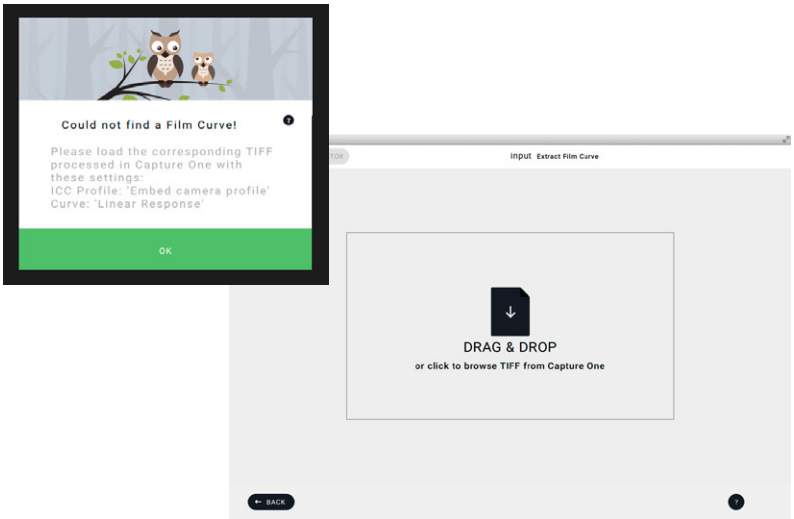
4.3.5 ICC profile creation using RAW data for Capture One

Capture One software can inherently only work with ICC profiles. And in principle no ICC profiles can be created from RAW image data.
That's why basICColor input has a build-in RAW-engine now! This means that basICColor input can "develop" RAW files itself. This function is primarily used for the internal representation of RAW data in basICColor input. In combination with a film curve from Capture One, basICColor input is also able to directly create ICC profiles from RAW image data.

This requires that the film curve used in Capture One is made available for basICColor input. An image is developed and saved as TIFF-file with Capture One software first (as outlined in previous ones chapters)

If a RAW file is then dropped onto the Job, basiCColor input "looks" if a TIFF-file with this particular film curve was used before and makes use of it again.

If no matching film curve is available, basICColor input requests the Captue One developed TIFF-file in order to extract the C1 film curve for further processing.



Once a film curve is "known" by basICColor input further RAW files can be processed - no further TIFF file(s) input is requested.

Please note that Caputre One software offers various film curves. If you are not always working with the same film curve we recommend to create several basICColor input Jobs for different C1 film curves.

4.4 DCP-profile creation for Lightroom and Adobe Camera RAW

Through the single-step color conversion in the Adobe-DCP -workflow handling of the profile creation is very dependant on the chosen DCP calculation parameters. Either the automatic exposure of Adobe (profile setting „Photography“) or experienced user (profile setting „Art Repro/Archival“) adjusts the white point.

4.4.1 Preparing the target shot

DCP profiles are calculated on the basis of RAW and DNG files. Therefore no special preparation is needed. Load the RAW files directly from your camera into basICColor input. The important thing is that you have already adjusted the white balance on the camera - best with a metamerism-free gray card.

Due to the fact that especially Hasselblad cameras have sensors from different companies it is possible that input cannot retrieve the correct identifier for the dcp profile and your profile won’t show up in Adobe Camera Raw. If that happens please use the latest Adobe DNG Converter and convert your Raw file to a DNG. If you profile from the DNG input will be able to write the correct information into the dcp profile.

If you want or need to change the white balance, or the RAW files are not recognized because the camera is not directly supported by basICColor input, use DNG. Open your RAW images first in Lightroom and ACR, and convert them to DNG before loading them into basICColor input. In DNG a changed white balance can be stored within the file, in other RAW formats only in the Light-room-catalogue or in a separate sidecar-file (XMP) that can not be loaded into basICColor input.

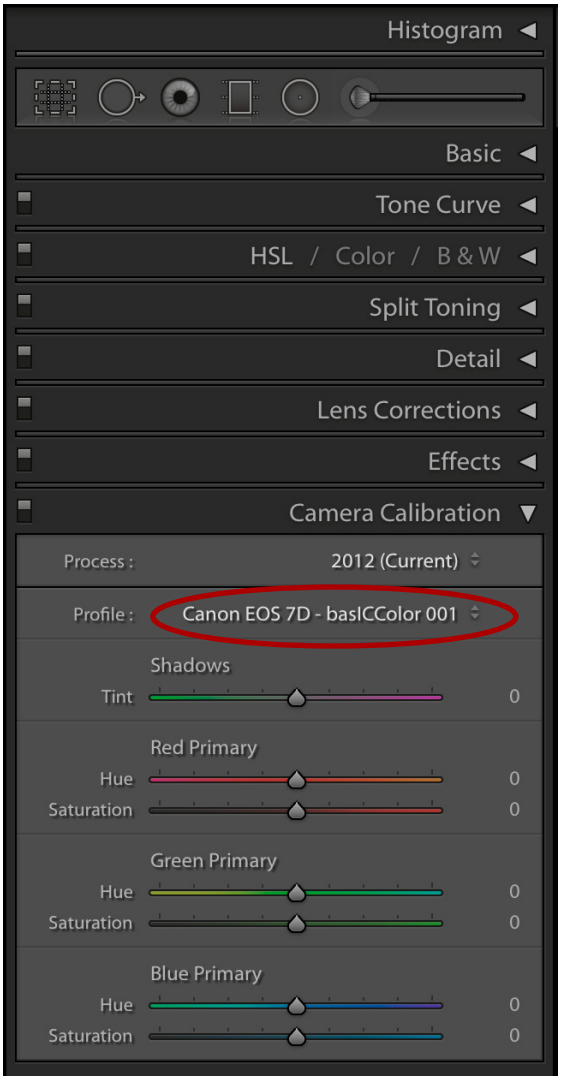
4.4.2 Calculation parameter of basICColor input

DCP-profiles are created for Adobe programs (Lightroom / Adobe Camera RAW / Bridge) only. You will therefore find all parameters described in detail in section 3.5.1 of this manual (page 23 forward).

4.4.3 Using the profiles in Lightroom

basICColor input automatically saves the DCP's profile to the correct operating-system folder. Launch your Adobe program again, when a newly created DCP profile is not yet displayed. Find the DCP-profiles in the Camera Calibration tab.

The profile calculation setting „Photography" generates an automatic dynamic exposure adjustment with the Adobe RAW converter when applying a profile. If you have created your profile DCP with the „Art Repro / Archival" setting, your images will possibly initially a appear a bit too dark, as this type of profile suppresses the automatic, dynamic exposure adjustment of Adobe in favor of a higher color accuracy. The user can adjust the exposure and white point. Adjust your white point within the RAW conversion via the exposure settings or scale your data after development via Adobe Camera RAW in Photoshop linearly with the help of the curves or tone-value-tool to the desired white point.



If your workflow always requires the same exposure compensation, you can also calculate a new „Art Repro/Archival“ DCP profile with a fixed exposure compensation (half-step increments) for a more comfortable workflow. This setting combines the „Art Repro/Archival“ profile calculation method with a static Adobe exposure adjustment within the RAW conversion.
Read chapter 3.5.1 for more details.

Chapter 5

Shooting the Profiling-target

5. Shooting the profiling target

5.1 Illumination, light source and shot

5.1.1 Illumination

Aim:
The basis for the calculation of a camera/scanner profile is the comparison of the measured data from the profiling target (measured with spectrophotometer) and the RGB values of the patches from the image or scan.

Most measurement devices use a so-called 45°/0° measuring geometry. The measuring surface is illuminated at a 45° angle, from one or more light sources, the measuring optics „guide“ the light below 0° to the measuring sensor. The principle is a classic photography repro structure. Therefore the target must be photographed in this lighting.

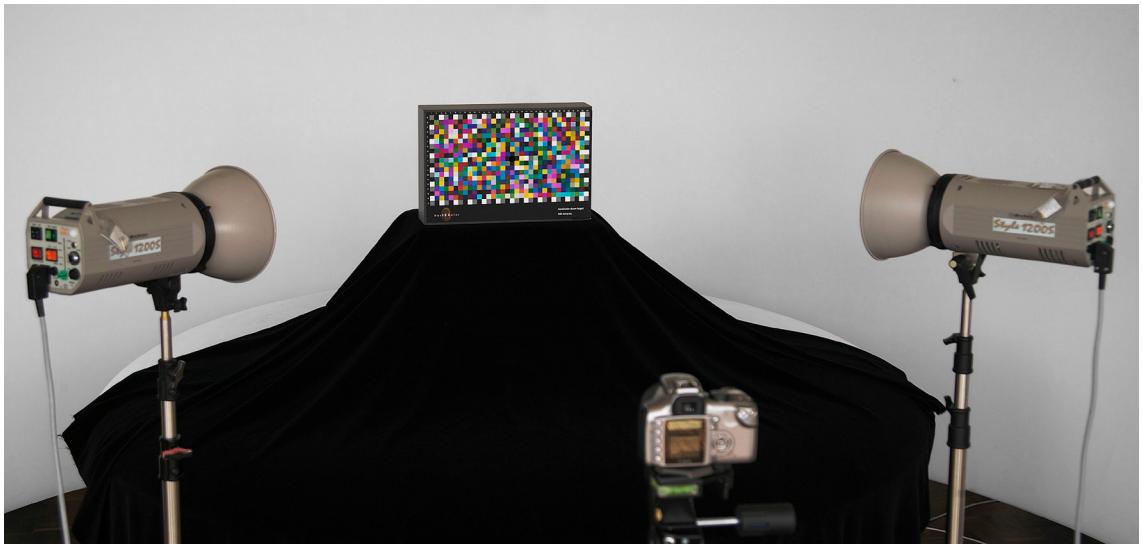
In regard to color and exposure a uniform illumination is extremely important for the profile quality

ΔRGB < 5 **the RGB values should not fluctuate more than 5 over the target surface**

Scanner
Scanners are usually constructed in a 45°/0° geometry also. When profiling scanners, the illumination should always be easily achieved and it should be sufficiently uniform. However, put your target in the center of the scanning width, not near the edges

Photostudio

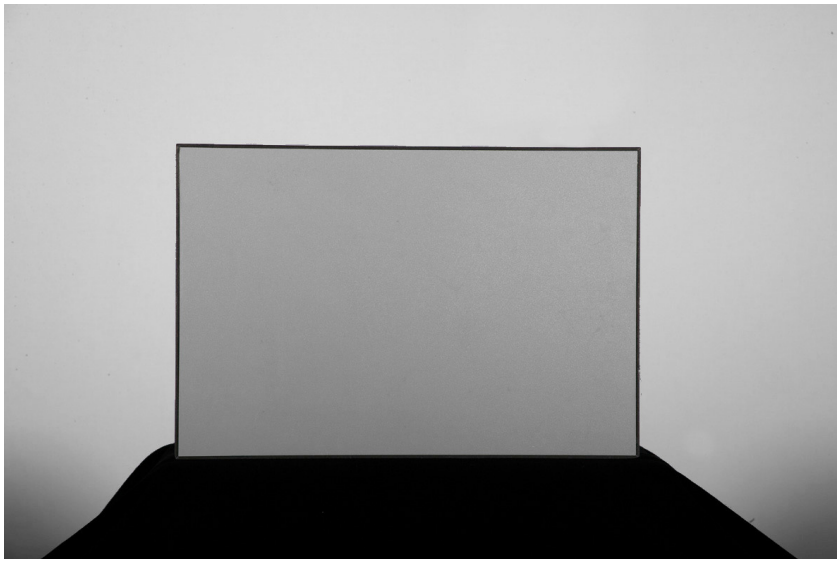
For the shooting of a target for camera profiling for profiling studio light, set up a repro lighting with two lamps. Use normal reflectors, set the lamps to the same height as the target and position them at an angle of about 45° and from the target as far away as possible. This is the easiest way to achieve a uniform illumination. Also highly suitable are two narrow softboxes. If space is tight, put the lights on a slightly shallower angle (60° to the optical axis) in order to prevent reflections on the lens.



Pay attention to surface reflections on the profiling target - particularly on targets with a semi gloss surfaces. A good indicator are the black patches. If there is sufficient distance between the lamps, you can use square softboxes or umbrellas if their standard reflectors generate light illumination structures. The width of the soft box should be significantly less than the distance of the lamps to the target. If large soft boxes are too close to the target profile, the risk of surface reflections increases and the illumination no longer agrees with the measurement geometry of the reference data.

Whilst (high) studio ceilings usually do not return disturbing light, bright floors or a substructure can often cause uneven illumination. Use black lining - especially when the ground is colored.

If you use the basICColor dcam target with light trap, use the built-in (on the back) full frame gray card to control the uniformity of the illumination. Pay attention not only to the brightness, but also to any color deviations. If the lamps vary in color, you should replace one of them. To test the color match it's best to take to a seperate shot with each lamp.



Natural day light.

For profiling with natural daylight, the same rules as for studio light apply in principle, but the light management can be more difficult. The aim is a uniform illumination without reflections in respect to color and brightness. Search for a suitable shooting location and eliminate reflections - use black lining if needed. In difficult environments, shoot the target from an angle. You can set the grid in basICColor input 5 so that the distortion from the angled shot is taken into account. By doing this you can achieve a uniform Repro lighting:

- Illumination of target	under 0°
- Shot	under 45°
- Black lining to stop reflections	under -45°

5.1.2 Camera-focal length, picture section, resolution and lens correction

Critical, when shooting the target, are local reflections. Therefore, it's best to use a light telephoto lens. So you have a narrow shooting angle, the lamps can be positioned well and keep reflections under control easily. Wide-angle lenses are unsuitable .

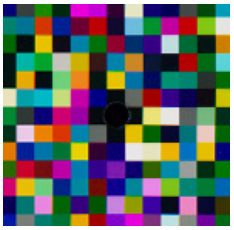
Use approximately half the picture diagonal for the target. The natural vignetting of the lens is thus negligible and edge shading with larger apertures take less affect. The picture section is usually not a problem as for the profile calculation no high resolution is required.

In the ICC profiling (TIFF / JPG) a lens correction (vignetting) may be applied additionally in order to achieve an even more homogeneous illumination. The correction of chromatic aberration can also be turned on, but does not affect the profiling, since the patches are evaluated not quite to the edge. In the calculation of DCP profiles a lens correction is obsolete, since the RAW file is processed directly.

5.2 Exposing the picture and exposure correction in the profile

5.2.1 Exposing the profiling picture

The shot used for profiling should precisely show the white fields of the profiling targets (RGB values 240), highlights in the chrome ball of CaliCube may be higher. The light trap shows the noise of the system (ideally RGB = 0/0/0), the black patches should be clearly distinct. If in doubt, expose somewhat scarce to get more tone value reserve in the lights.



When checking the RGB values for the exposure in the RAW converter with the pipette, the color management is already active. For ICC profiling in Capture One (for example), set the exposure settings „Embed Camera Profile„ for the pipette tool. This ensures you are seeing the right camera and RGB values. If a working space (eciRGB v2, AdobeRGB, sRGB,...) for the output is set in the exposure settings, the pipette indicates the into this color space the converted RGB values, which can lead to significant distortions depending on the active camera profile.

5.2.2 Exposure control by the profile

Since the processing of ICC profiles and DCP profiles differs greatly, the exposure control by the profiles is very different

There are 4 options:

ICC-Profile

ICC based applications apply these profiles „absolute“ on the data. A camera profile is assigned to the final data (passed through the demosaicing process) and only controls the further processing. When calculating the ICC-Profile the „Auto Exposure“ setting can be activated , which corrects the RGB values before the profile is calculated.

a) Profile calculation with „Auto Exposure“

- the RGB-values are adjusted prior to profile calculation
- ICC-profiles from differently exposed images are very similar
- ICC-profiles do not expose correct when beeing applied.

b) Profile calculation without „Auto Exposure“

- The RGB-values are used untouched
- ICC-Profile from differently exposed images differ clearly
- The ICC-profile controls the exposure when applied.

Example: Profiling image under exposed

-> ICC-profile adjust the brightness
(comparable to the tone value priority in the camera)

Digital Camera Profiles (Adobe Camera RAW, Adobe Lightroom, Adobe Bridge):

The basic behavior of ACR is an exposure adjustment of the data. This function is used with the „ Photography“ setting. It makes the workflow quite comfortable, but reduces the maximum achievable accuracy slightly by the type of automatic adjustment. By the use of option „Art Repro/Archival„ basICColor input 5 prevents this automatic adjustment by a predetermined curve in the DCP profile.

The final white point adjustment of each image is then carried out manually by the user. Usually the brightness needs to be increased. Therefore it's possible to set a standard correction in the DCP profile in half step increments. Alternatively, you can save the exposure increase together with the DCP-profile as a default value in a processing application like Lightroom .

c) Setting „Photography"
- automatic exposure adaptation through the RAW-converter
- optimized for a faster and further automated workflow

d) Setting „Art Repro / Archival"
- manual exposure adaptation through the user
- optimized for a maximum color coordinate accuracy
- setting of standard correction in half step increments possible

5.3 White-/Neutral-/Grey balance

5.3.1 White balance and camera profile

White balance and camera/scanner profile work together - like linearization curves and printer-profile in print. The white or neutral balance, together with the exposure, defines the operating point of the input system, which the ICC/DCP-profile then describes. Therefore carry out a neutral balance before profiling and before production shooting.

5.3.2 Usage of grey cards

Use always the same metamerism free gray card for profiling AND production - the basICColor gray card for example. It is also incorporated in the rear of the light trap for basICColor dcam target. Strictly speaking, a camera profile only describes one lighting situation. With a reliable neutral balance using a metamerism free gray card a camera profile is quite usable for several (spectrally similar)light situations. The gray area of basICColor CaliCube also consists of this material .

The Kodak gray card, however, is intended only for the exposure in analogue photography . It is unsuitable for the gray balance in digital photography.

5.3.3 Grey balance in camera and software

The neutral balance can be carried out both in the camera and in the software . Both have advantages and disadvantages.

Grey balance in the camera

+ fully applicable for JPG and all RAW workflow
+ automatic adoption when exposing
- troublesome in practice in highly variable lighting conditions
- usually requires a somewhat larger grey card

Grey balance in the software:

+ im RAW-workflow comfortable and flexible
+ a small neutral surface works
+ usable for ICC-profile creation and in the production situation, due to the ICC-profile being calculated on basis of a exposed TIFF file
- When DCP-profiling only changeable if the DNG file format is used because the DCP-profile is calculated on the basis of unprocessed RAW data
- lossy at JPG workflow

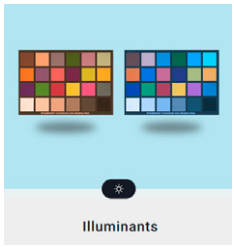
5.3.4 Conversions-filter vs. electronic white balance

The sensitivity of camera sensors is optimized by many manufacturers to average the expected light spectrum. In warm to average daylight most sensors show a fairly even channel distribution.

If the color temperature is very low or very high, red and blue channel are exposed greatly different. In particular with very warm artificial lights the blue channel is heavily underexposed compared to the red channel, whereby the system noise increases more than the selected ISO sensitivity suggests.

In artificial light situations where the shooting light is scarce, one would prefer a faster shutter speed and an electronic white balance and possibly its own camera profile for artificial light .

However, if enough artificial light is available (for example, photo studio with halogen lights) the „analog„ white balance conversion filter in front of the light sources or the object is the better choice. In this case one can also work better with a daylight-based camera profile .

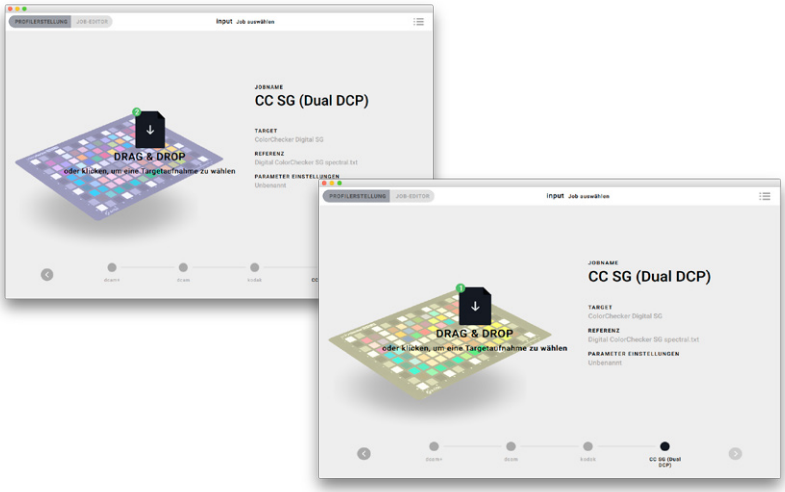


5.3.5 Dual-DCP-profiles

When using Digital Camera Profiles (Adobe Camera RAW , Lightroom, Bridge) another very effective tool for dealing with very different color temperatures is available: the Dual Digital Camera Profiles

Here an image with a cold light (about 6,500 Kelvin, cool daylight) and one in warm light (2850 Kelvin, halogen lamp) are combined into a digital camera profiles . The profile then contains two color conversions and interpolates in-between, depending on the color temperature of the current capture.

For profile calculation load the D65 shooting first, then the halogen-light shot.



The effect in practice is similar to a series of profiles for different color temperatures that are selected automatically . For maximum color accuracy you should still standardize the shooting situation as best possible and, if necessary, optimize the noise performance of the sensor . If changing light conditions can not be avoided a dual DCP profile is the most efficient way to deal with this situation and to achieve the maximum possible accuracy in a simple manner.

Chapter 6

Metamerism and spectral profiling

6. Metamerism and spectral profiling

The term metamerism generally describes the effect that the spectral properties of light and object are not clearly recorded by a three-channel sensor as our eyes (XYZ) or an RGB-based recording system. As a result, the same object color may look different under varying conditions or two colors appear sometimes equal, sometimes different.

6.1 Metamerism effects

In practice three metamerism effects have to be discerned.

Sensor-metamerism:

- a spectral color stimulus (or a spectral object color + a light spectrum)
- two sensors

=> two different color coordinats in the 3-channel system

Light/Object-metamerism - change of illuminant

- one sensor
- one object color (reflection spectrum)
- two illuminants

=> two different spectral color stimuli
=> depending on illuminant same or different color coordinates in the 3-channel system

Light/Object-metamerism - metamere object colors

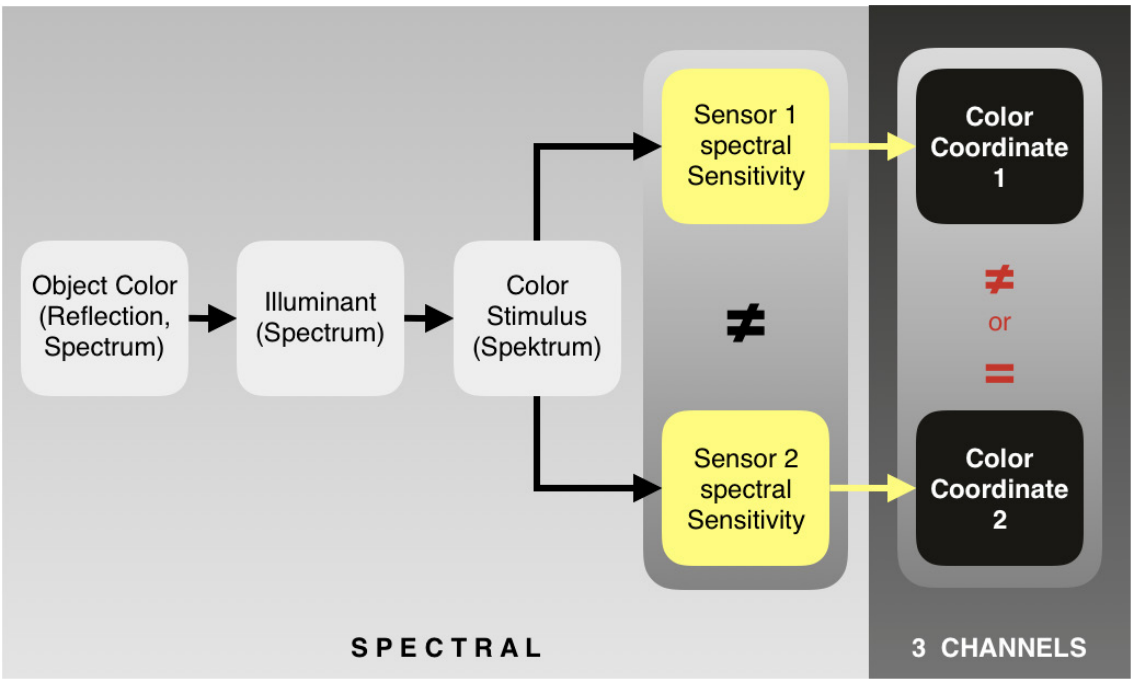
- one sensor
- one object color (reflection spectrum)
- one illuminant

=> two different spectral color stimulus
=> depending on illuminiant same or different color coordinates in the 3-channel system

6.1.1 Sensor-metamerism

The same spectral color stimulus is perceived differently by two different 3-channel sensors .The cause is a different spectral sensitivity of the color channels of the two sensors. This effect is apparent on monitor calibration also: the same spectrum of a monitor is measured slightly different with two different colorimeters (also 3 -channel). The result in monitor calibration is a slightly different white point calibration despite the same software setting. Using recording systems, the white point is usually equalized by the neutral balance . The sensor metamerism shows mainly by a different hue angle and saturation.

- a spectral color stimulus (or a spectral object color + a light spectrum)
- two sensors
  => two different color coordinates in the 3-channel system

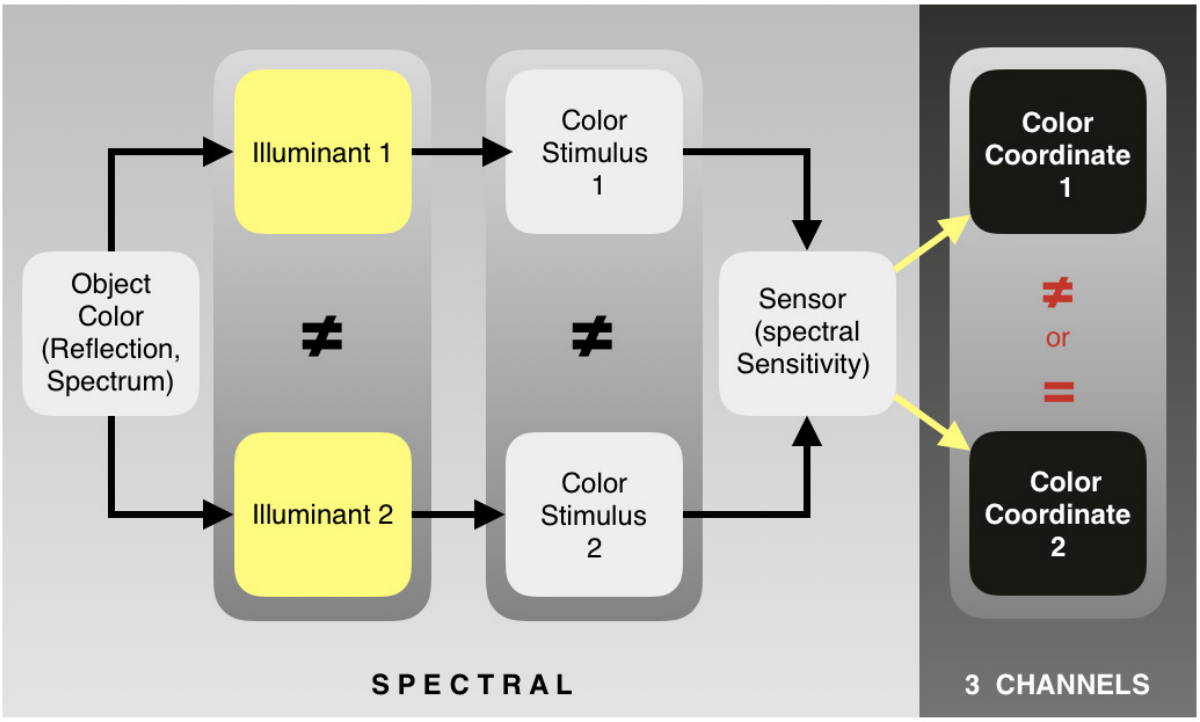


6.1.2 Light/Object-metamerism

(- change of illuminant)

The same object color may appear different for one sensor under two different illuminations despite adaptation to the appropriate color temperature . This effect is known in everyday life in the selection of clothes (black in artificial light , in daylight dark blue ; brown in artificial light, olive in daylight; reds that shift, depending on the light, towards magenta, blue tones that change towards lila; changing color cast of grey ...). In photography, of course it is not only the human eye affected, but also the RGB sensors of cameras. The reason is that the same reflection spectrum of the object generates with the spectra of two different types of light two different spectral color stimuli. This can also create two different colors (color coordinates) when evaluating by the sensitivity spectrum of the sensor in its 3-channel color system, despite a white point adjustment .

- one sensor
- one object color (reflection spectrum)
- two illuminants
  => two different spectral color stimuli
  => depending on illuminant same or different color coordinates in the 3-channel system

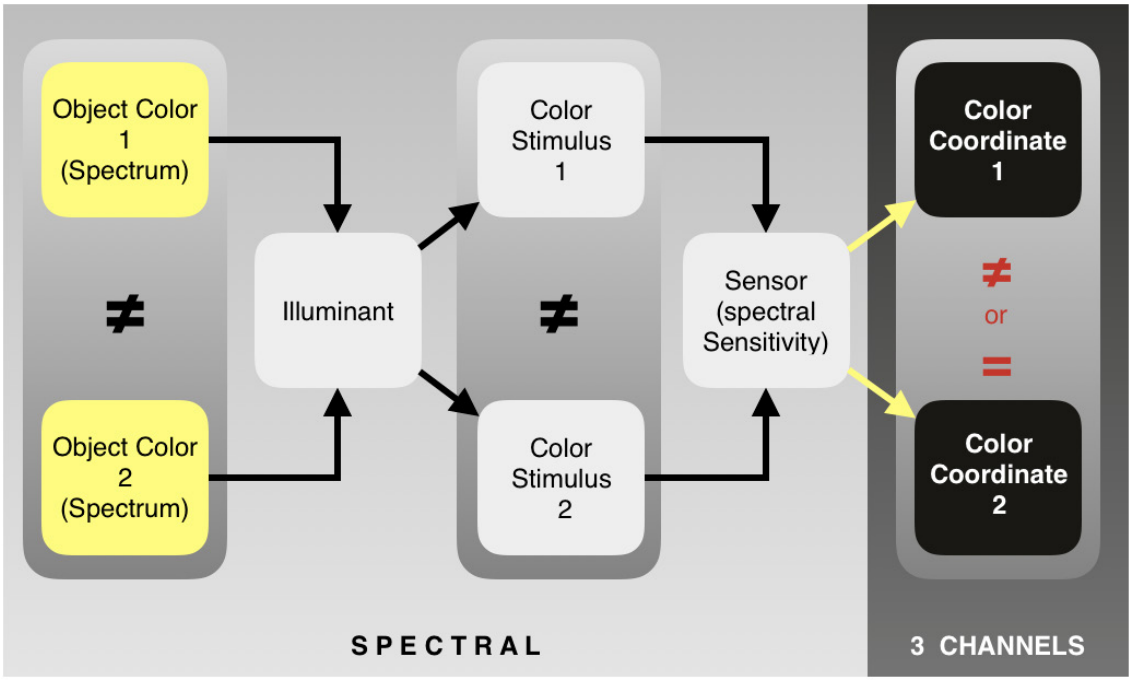


6.1.3 Light/Object-metamerism

(- metamere Object colors)

The same effect can also cause for two spectrally different colors, that a spectrophotometer can distinguish clearly, to be perceived as equal for the eye or camera. Depending on the type of light they lose their differentiation and are seen as the same color or a different color. This effect is also known in everyday life when choosing clothes, for example.

- one sensor
- two object colors (reflection spectrum)
- one illuminant
  - => two different spectral color stimul
  - => depending on illuminiant same or different color coordinates in the 3-channel system

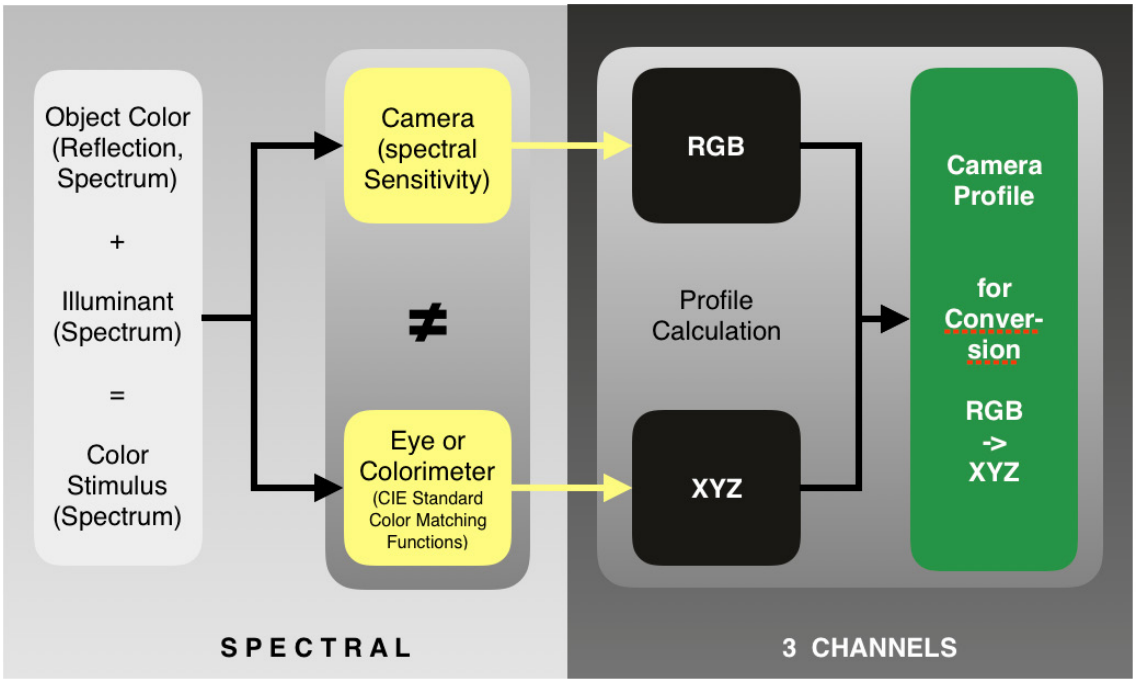


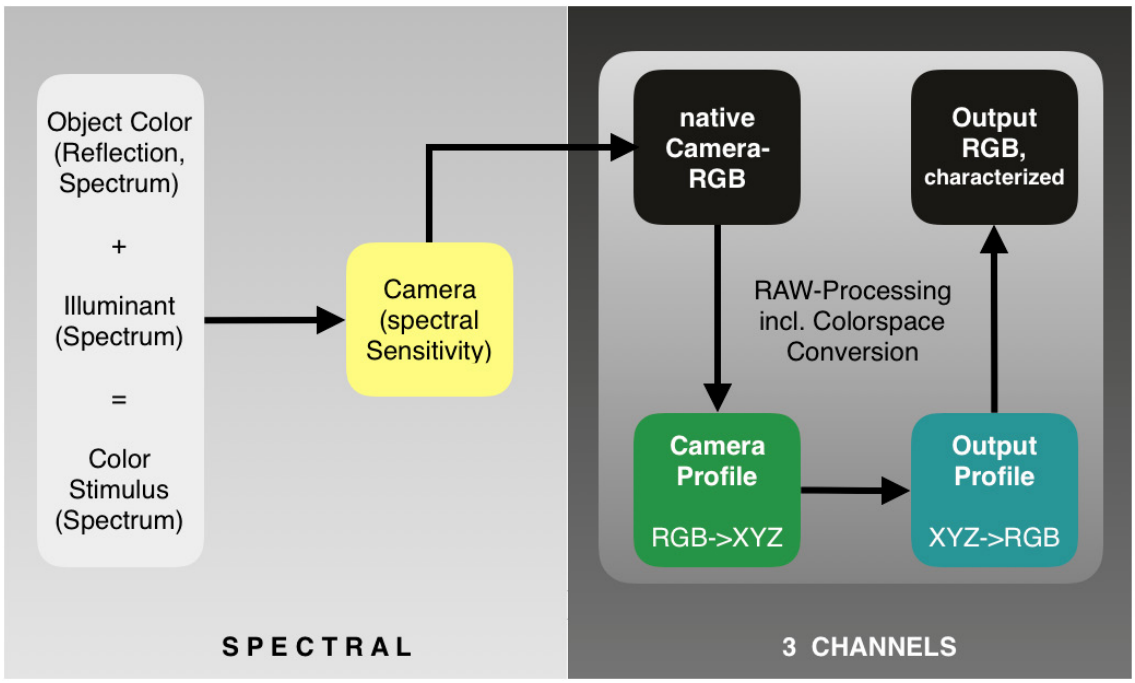
6.2 Metamerism in the workflow / spectral profiling

In digital photography, we encounter all metamerism-effects at some point.

6.2.1 Sensor metamerism balance

The balance of sensor metamerism is the basic function of the profile of input systems. The camera/scanner profile corrects the differences between each device and the human eye under a defined condition .





6.2.2 Light metamerism balance

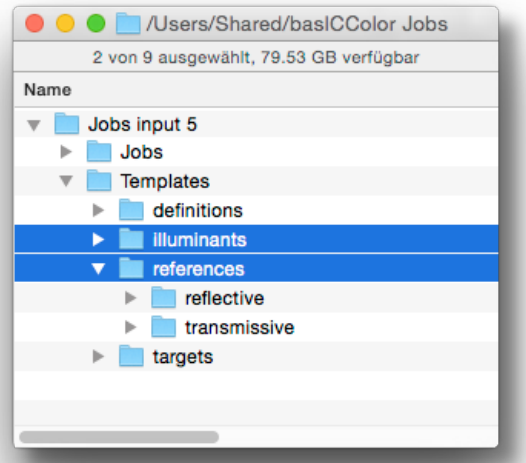
(Shooting light vs. Color proof light)

Templates, which are used for profiling, are not free of metamerism. As long as the shooting light and the color proof light are identical or at least very similar fewer metamerism-effects occur.

Shooting light:	Light spectrum used for photographic shooting
Color proof light:	Light spectrum used when comparing original and image file or in the consideration for printing the image file is used

The standard procedure for profiling input devices is the use of D50, which is standardized in the graphic arts industry as a color proof light, as a light reference. The XYZ or Lab values which describe the color appearance of the fields of the profiling targets under this standardized light are correlated to the RGB values of the camera for the profile calculation .

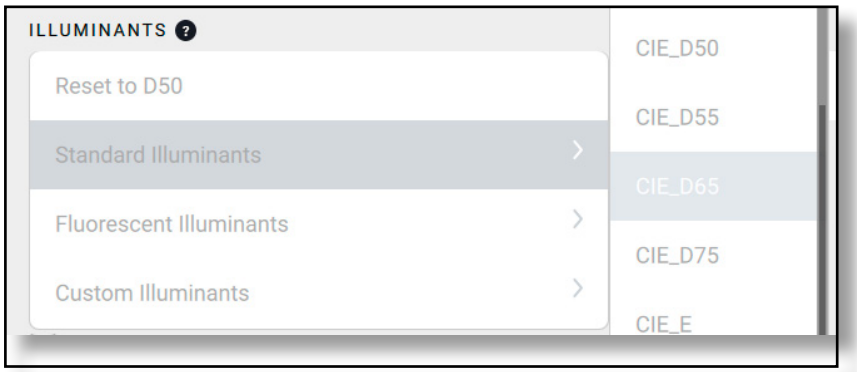
Alternatively, any other shooting light or color proof light can be used as a reference light in basICColor input 5. The XYZ or L*a*b* values required for the profile creation are then calculated considering the reflection spectra of the target colors and the selected light spectrum.



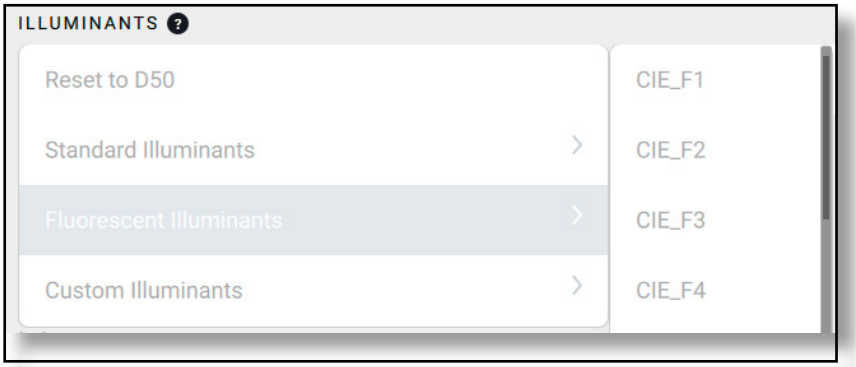
You need spectral reference data for your target. For various standard illuminants spectra are stored in basICColor input 5. Additionally, you can measure your individual profiling target or your shooting or color proof light with basICColor catch spectrally. The measured data are stored in the Templates folder in the input 5 Presets folder (Public documents or for all users: basICColor Jobs/Jobs input 5/Templates/...) in the sub-folders „ Illuminant „ and „ references „

If your profiling preset uses spectral reference data additional choices for the illumination spectrum and the standard observer are available in the Expert settings of basICColor input. The illumination light sources are divided into three groups.

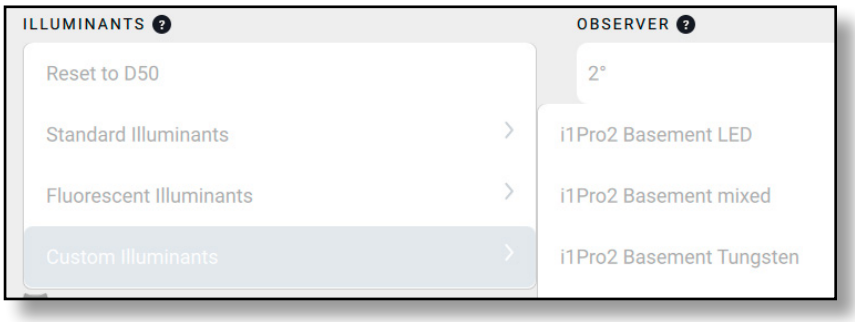
• Standardized light source (CIE_xxx)



• Standardized Fluorescent light source (CIE_Fxx):



•Custom (measurement data in folder„illuminants“)



All lighting spectra can be freely combined with the 2 ° - or 10 ° Standard observer on the reference values for the profile calculation .

Depending on the metamerism-effect of your targets - compared to the objects of your photographic production - several objectives can be reached with the spectral profiling:

A) Target and photo objects show a significant but similar metamerism effect compared to D50

With the spectral profiling you can - with reference to the white point - achieve the color appearance that the objects show during the shooting (shooting light) or when viewing (color proof light). In print production or for exhibition purposes with known illumination, a spectral profile should be used in the calculation of the printer profile to match the workflow.

B) The profiling target shows a definite metamerism-effect in the shooting light, the photo-objects behave less conspicuous at this point.

As a profiling target must also contain very bright colors, it can occur with light sources with a low color rendering index that the target shows a stronger metamerism-effect than the photo objects. By a spectral profiling, considering the shooting light, you can possibly produce smoother camera profiles with lower ΔE values in this situation.

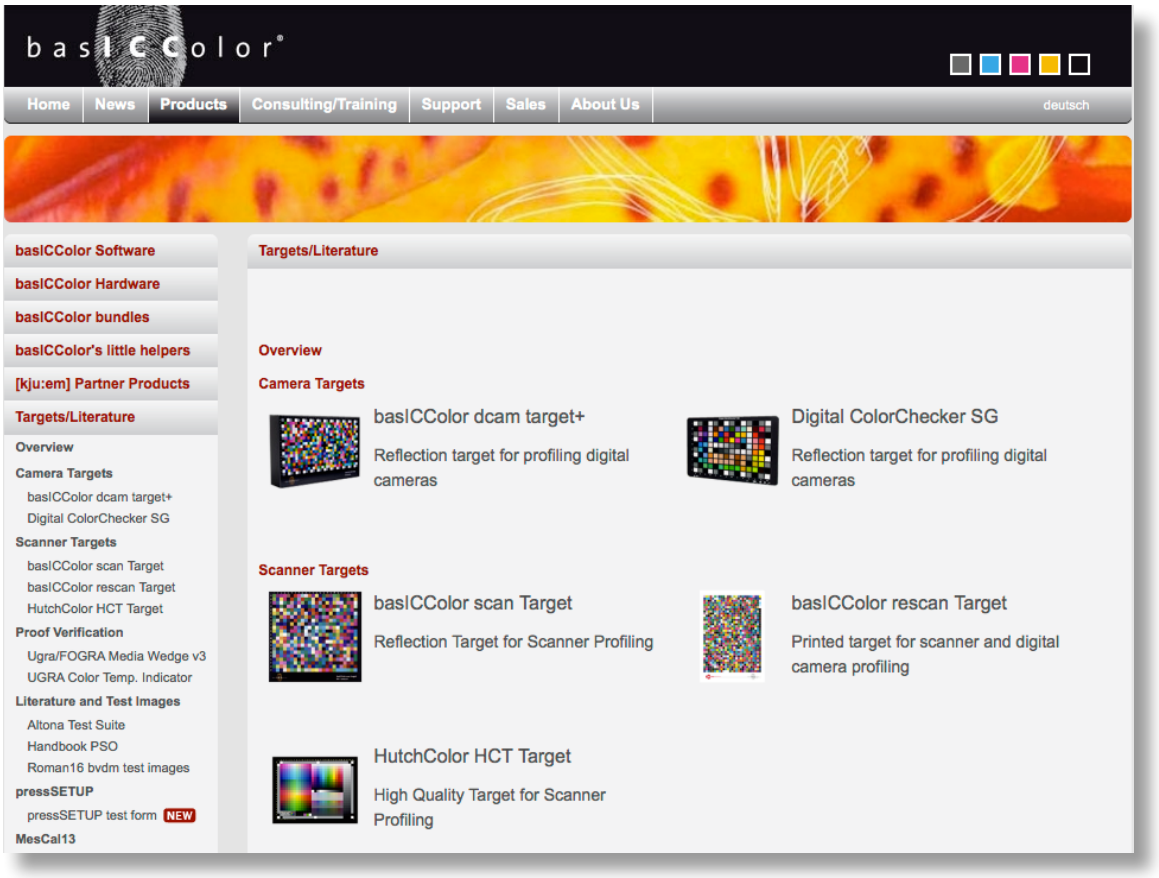
6.2.3 Balance of metameric colors

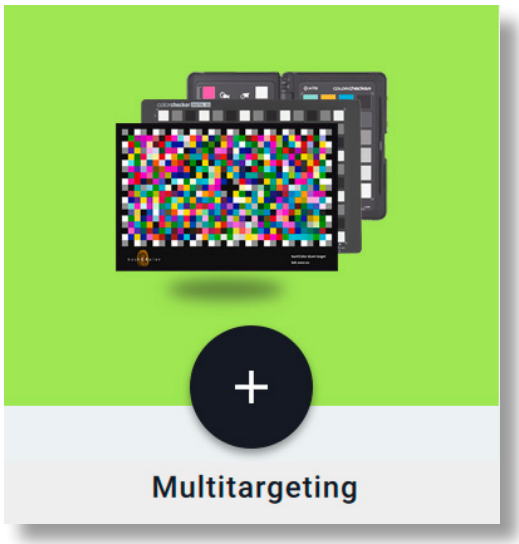
(- metamerism of profiling targets)

If the photo objects show significant metamerism-effect which differs to the behavior of the standard profiling targets colorimetric data (best: spectral data) are need for a correct reproduction on a 3-channel system of the photo object. An independent automatic correction of metameric colors would only be possible in a spectrally-working capturing system .

Ideally, use a profiling target which is constructed with the same dyes/pigments as the photo/scan objects (for example: scanning/repro/art-repoduction).
Particularly for scanner profiling, this procedure is very common because the diversity of materials is limited. The profiling templates are based on various film and paper types and print profiling targets .

You can find a selection at basICColor below:
http://www.basiccolor.de/scanner-targets/





In basICColor input 5 multiple targets can be combined to a profile (see multi-target profiling). Thereby it is possible to use a standard target for rough imaging of the entire color space with an individual special target e.g. to combine some problematic original colors .

Chapter 7

Product Information basICColor input 5

7. Product Information basICColor input

7.1 Credits

UI-Design:
Huangart | digital branding

Core Color Engineering:
Franz Herbert

Core Engineering:
Dr. Martin Münier, Nils Heidorn, Thibault Lepoutre

Manual written by:
Tim Seher, Markus Hitzler, Werner Le Roy

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