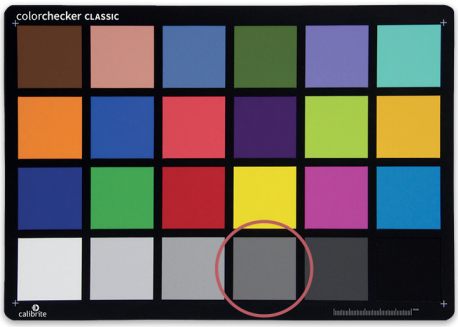
Creating DNG and Dual Illuminant DNG Camera Profiles

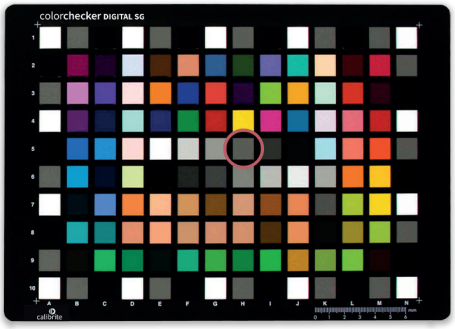
for Adobe Photoshop® and Photoshop Elements® workflows

Photoshop® and Photoshop Elements® both use Adobe's Camera Raw (ACR) Plug-in. To make a DNG camera profile for use in these applications, the first step is to capture an image of your Calibrite ColorChecker Classic 24 patch target or Calibrite ColorChecker Digital SG 140 patch target, and save the camera RAW image as a DNG file. For Dual Illuminant DNG calibrations, you will need to capture and save two DNG images of the chart, each with the chart uniformly illuminated and captured under significantly different illumination types (see notes at end regarding Temperature Grading for Dual DNGs)

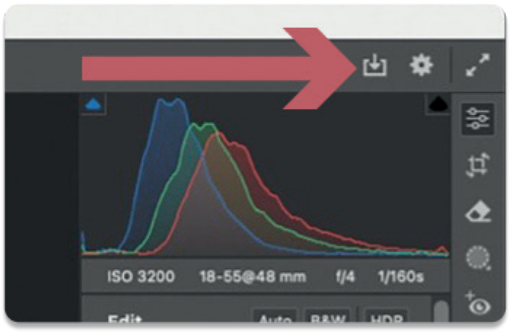
ColorChecker Target Capture

- For Calibrate PROFILER software to automatically detect the ColorChecker target, its width should fill at least 10% of the image width (can be smaller for cameras with a resolution greater than 25MP)
- Ensure that your in-camera white balance is set appropriately (not set to Auto), and this in-camera setting should remain for the main session.
- The ColorChecker target should be illuminated uniformly with correct exposure, positioned in the scene of the intended final images.
- *For Dual Illuminant profiles, when capturing the ColorChecker images under each illumination type, use the same camera, lens and ISO settings for both.*
- *For Dual Illuminant DNG profiles, each illuminant must be significantly different from the other (a table of acceptable ranges for Temperature Grading is listed at the end of this page.) Note; the in-camera white balance setting should be same for the capture of both target images (and not set to auto).*
- **Optimum image capture**
  - The white patch of the chart should fall within the rgb range of 180/180/180 – 242/242/242 (ideally at 235 RGB). The maximum variation between individual RGB channels should ideally not exceed +/- 3
  - The neutral grey patch below the yellow (H5 near the middle of the Digital SG, and the boarder pattern grey) should fall within the RGB range of 128/128/128 +/- 20.
- For optimum results when using the Calibrite ColorChecker Digital SG 140 target in a studio environment. Check that exposure values of the white border patches on all sides are within +/- 3 of each other. When using Calibrite ColorChecker Classic 24 patch target, take two shots – rotating the chart 180° to check the white values are within +/- 3 of each other (or use two charts).





ColorChecker Image Processing



- Open the RAW image of the target in to Adobe® Camera Raw.
- Do not edit the image – check it is correctly exposed and white-balanced.
    - Place the cursor over the White patch which should indicate in the ACR Histogram, an RGB value in the range of 180–242 (ideally 235), with a maximum variation between channels of +/- 3.
    - Additionally, the grey patch below the yellow, should be RGB 128/128/128 rgb +/- 20 with a maximum variation between channels of +/- 3.
- Save the image as a DNG so you can then use it in the Calibrite Camera Calibration module.
    - Click the 'Save Image' button in the upper right corner of the application window (save icon is next to the settings/cog icon).
    - The save dialogue window will open and in the 'Format' drop-down, select 'Digital Negative'.
    - Click 'Save'.

For Dual Illumination DNG calibrations, repeat the process with the same chart captured under the second illuminant.

Creating an ACR Camera Profile

- Launch Calibrite PROFILER.
- Select the Camera module and click next.
- Select the DNG *(or Dual Illuminant DNG)* option, and drag/drop the DNG image of the target into the image pane.
- Calibrite Camera Calibration will attempt to automatically detect the ColorChecker in the image, align the overlay chart grid, and prompt to create the profile.
- If auto-detection fails (or incorrectly aligns), drag the corners of the grid to manually align, so the grid segments are centred over the patches in the chart image. Zoom and/or switch from the 24 patch grid to 140 patch grid format if necessary.
- *For Dual Illuminant DNGs you will be prompted to load and repeat for the second chart image.*
- Give the profile a meaningful name that describes the lighting conditions etc and click Save. By default, it will be saved to a directory that Photoshop, Photoshop Elements and Lightroom use to store and apply DNG profiles.
    - **Mac:** /Users/<username>/Library/Application Support/Adobe/Camera Raw/Camera Profiles/
    - **PC:** C:\Users\<username>\AppData\Roaming\Adobe\CameraRaw\CameraProfiles

Using DNG and Dual Illuminant DNG Camera Profiles

- Restart your RAW image editing application to use the new DNG profile. The new saved camera profile will be available in the Basic panel in Lightroom and Camera Raw.
- In Camera Raw, open an image captured under the conditions of your new calibration, and click on the profile browser icon at the top of the right-hand pane to list available calibration files.
- The camera profile you have created will be under the category labelled as Profiles.
- Selecting the camera profile will refresh the image to the corrected colours.
- For best results, check image exposure (242–180 range) and set white-balance from the target image.
- The white balance should be set after the profile is applied. Use the White Balance eye-dropper tool to click on your preferred white-balance neutral patch in the chart. Generally either the 18% grey (patch below the

yellow), or the light grey patch adjacent to the pure white patch. The maximum variation between individual RGB channels should ideally not exceed +/- 3.

- Open the image into your preferred Adobe application working colour space, such as Adobe RGB or P3.
- The camera profile and same White Balance setting should then be applied to all images in the session.

Calibrite PROFILER's Profile Manager

- To check DNG profile settings, use the calibrite PROFILER utility named Profile Manager, and select > Camera > DNG. DNG profiles can also be filtered, enabled/disabled and deleted through the utility. to check DNG profile settings. DNG Profiles can also be enabled/disabled and deleted through the utility.

For Dual Illuminant DNG profiles, both of the illumination temperatures are listed (graded as indicated below).

Temperature Grading

Dual Illuminant DNG profiles can be made with any two of the supported illuminants. They must have different correlated colour temperatures (CCT), and for best results, the CCT (in degrees Kelvin) should not be very close.

For Dual Illuminant DNG profile illuminants, the two correlated temperatures are referenced as follows:

00	Unknown
01	Daylight
02	Fluorescent
03	Tungsten (incandescent light)
04	Flash
09	Fine weather
10	Cloudy weather
11	Shade
12	Daylight fluorescent (D 5700 - 7100K)
13	Day white fluorescent (N 4600 - 5400K)
14	Cool white fluorescent (W 3900 - 4500K)
15	White fluorescent (WW 3200 - 3700K)
17	Standard light A
18	Standard light B
19	Standard light C
20	D55
21	D65
22	D75
23	D50
24	ISO studio tungsten
255	Other light source