DiCentra FAQs – 9

Updated 17th January 2020

Colour Management and Colour Casts

Question: Sometimes my display and/or projector appears to have a colour cast. How do I fix this?

Answer: There are several possible causes for this. These include:

1. You are using a generic/default profile for the display/projector which does not include a gamma table to linearize the display's colour response.
2. You may not have installed the display/projector profile and set it as the Windows default.
3. In DiCentra, you may not have selected the correct projector profile before running the competition.
4. Although the display profile has a gamma table and it is set up correctly in Windows, the gamma table is not being copied to the display adaptor hardware when Windows is powered up, it comes out of hibernation or sleep or you log into a different account.

These are covered in more detail below.

Terminology

First, a little background.

ICC Profiles: These are used to provide the "best" rendition of colours from a digital image to the colours that the device (printer, display, projector etc.) can produce.

Custom ICC Profile: A standard profile for a display or projector may come with the device or be downloadable from the web. A custom profile is made using equipment such as a Spyder, Color Munki or i1. The display/projector profiles these produce usually contain a *Gamma Table (VCGT)* as well as the profile itself.

Installing Display Profiles: If you right-click on a profile file and select *Install Profile* it will be installed into the Windows profile repository (*C:\Windows\System32\spool\drivers\color*). To set it as the default profile for your screen or projector there are some extra steps needed (see below).

Display Adaptor: This is the hardware in your computer that a display or projector is plugged into.

Gamma Table: Also known as a LUT (look-up table), Calibration Table or VCGT (video card gamma table). The display adaptor uses this table to make fine adjustments to the RGB colour data to provide a smooth and appropriate visual response. It is usually loaded into the display adaptor at the start of a login session. In professional monitors it is often loaded into the display itself.

LUT Loader: Before Windows 7, *LUT Loader* software was installed in the *Startup Programs* folder on your machine when you made a custom profile. This was run when the machine started and transferred the gamma table to the display adaptor. From Windows 7, Windows has done this automatically if the display/projector profile contained a gamma table.

DiCentra Approach: Because users might have several custom profiles for different environments (e.g. small rooms with coloured walls, large halls, etc.) you need to select your preferred profile in DiCentra. It then loads the gamma table into the display adaptor. When you exit DiCentra it restores the original LUT, so your normal working colours are undisturbed.

Troubleshooting

Where does the cast appear?

If the cast only appears in DiCentra it is likely to be one of the following:

1. You have selected the standard *sRGB* profile from DiCentra's drop-down list. The *sRGB* profile does not contain calibration data and it is likely that your projector needs the correction that a custom profile would provide. Make a custom profile and use that.
2. You have selected the wrong custom profile from DiCentra's drop-down list. Choose a more appropriate profile.
3. Making custom profiles is not as repeatable as it ought to be in my experience, at least with older devices and profiling software. It is worth making a few profiles and retaining the one that portrays a test chart best.

If the cast appears in other applications, e.g. Photoshop, Lightroom, etc. but not in DiCentra it is likely to be one of the following:

1. You have not set up your display's/projector's default profile to be a custom profile. (sRGB is used in that case.) Fix it by making a custom profile if necessary and then setting it to be the default as indicated below. Note: Each user account on your machine can have different default profiles, so be sure to set up all accounts.
2. If your Windows default profiles are all set up correctly you may be encountering a bug where Windows fails to copy the gamma table to the display adaptor. Since Windows 7 this seemed to work fine, but recently (end 2019) I and several DiCentra users have noticed that it often fails when you resume from hibernation or sleep, or switch to a new user account.

   Note: In this case DiCentra will display colours properly if you have selected the correct profile in DiCentra's *Profile* drop-down.

   If you have an old LUT Loader around, copy it to the Windows *Startup* folder and this may fix it. Alternatively I have provided an application called *Check Display Gamma* at http://www.wilburimaging.com/wisoftware/DiCentraApps.htm#cdg
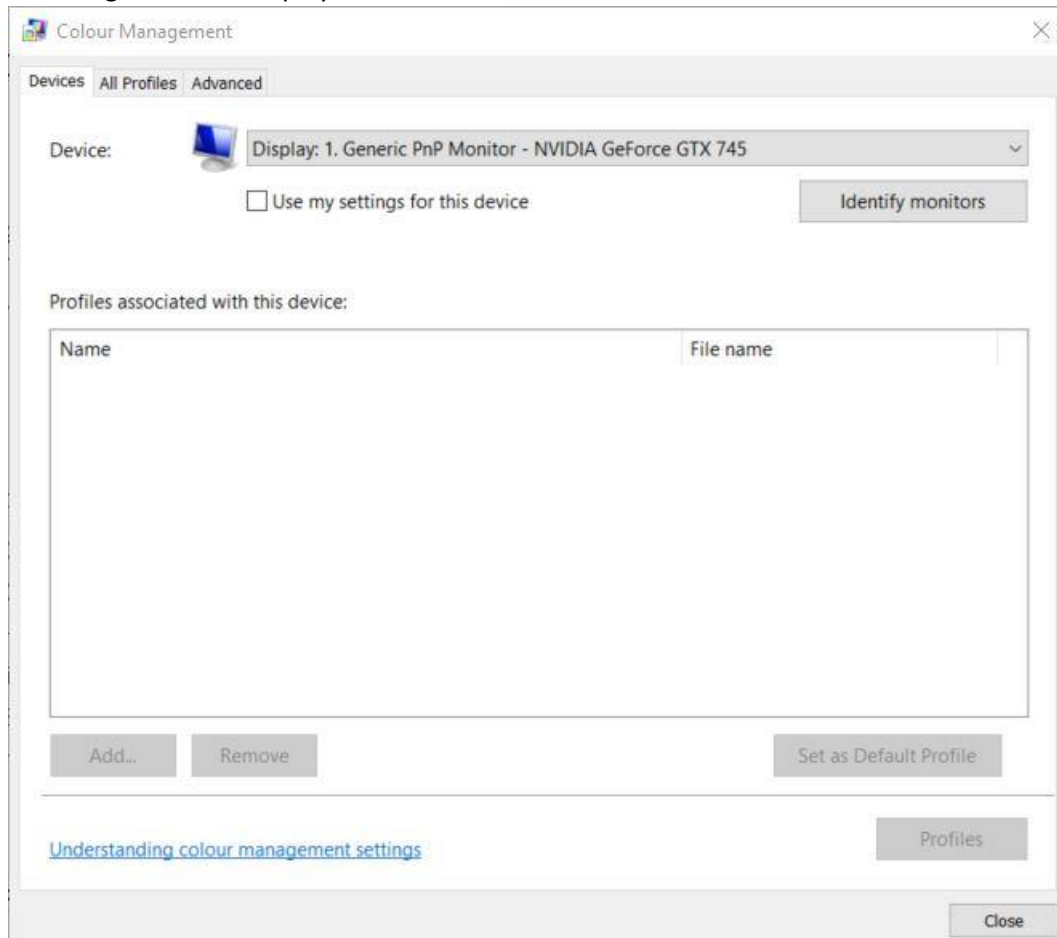   Run this to check if the LUT from the default profile is loaded properly, and if not, click the button to force it to be loaded.
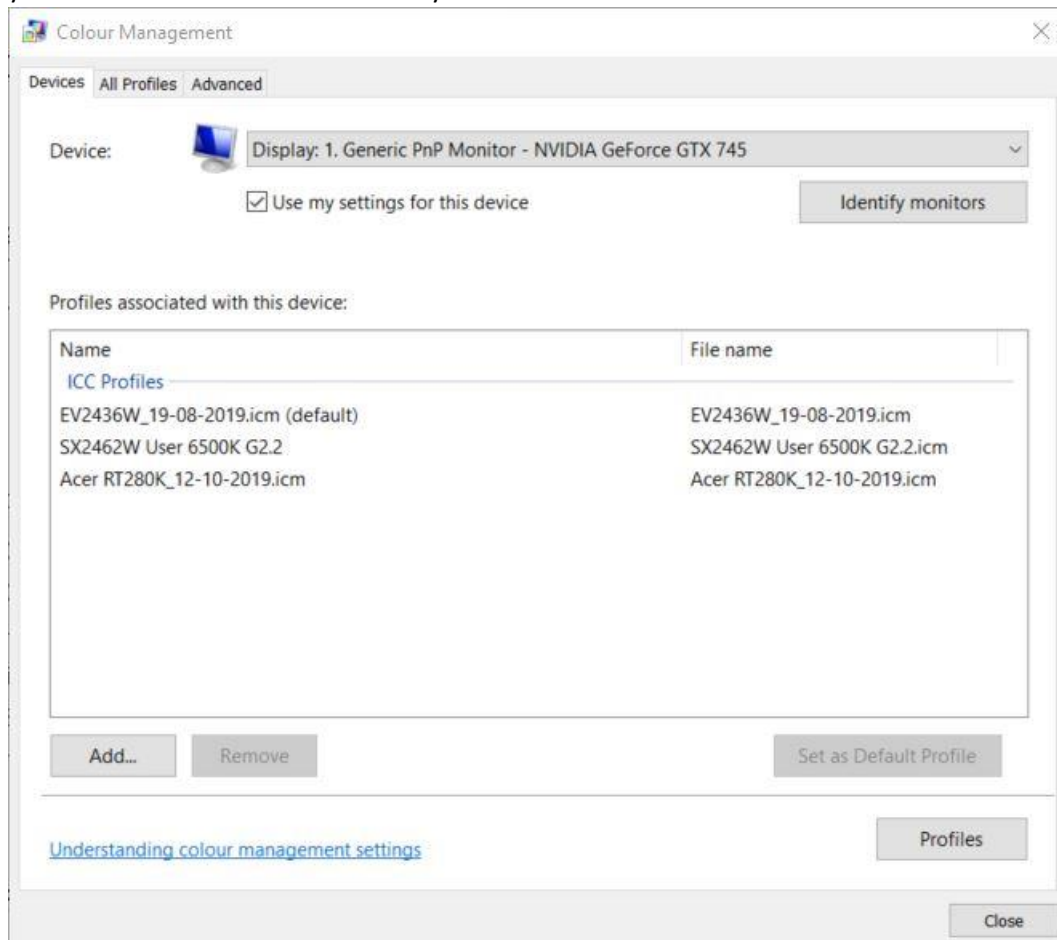
Setting Default Profiles (Windows 10)

1. Often, display/projector profiling software will install the profile just created as the default profile (and gamma table) to be used in future. If not, locate the profile, right-click it and select Install Profile to install it into the Windows profile repository (*C:\Windows\System32\spool\drivers\color*).
2. Right-click on a blank area of the desktop and select Display Settings. The *Display* control panel will appear.
3. Scroll down and click on Advanced Display Settings.

4. On the window that appears, click on Display Adaptor properties for Display 1 (or whatever number shows).

5. Select the Colour Management tab and then on the Colour Management button. The following should be displayed.

6. It is worth clicking on Identify monitors to check that you are working on the correct display, else use the drop-down to select another. Then select Use my settings for this device.

7. If you or your profiling software have already set up profiles to associate with this monitor, you will see them listed here. In any case the Add … button will now be enabled.

8. Click on Add … and a list of all the profiles on your machine, including printer profiles etc. will be shown. Select the display profile you want to use and click OK.
9. Select the default profile you want to use by clicking on its name in the screen above and click Set as Default Profile.
10. Repeat for any other displays on your machine from step 6. Only devices which are plugged in and switched on will show as displays in this dialogue, so it is best to do this immediately after profiling your projector while it is still connected.
11. DO use my *Check Display Gamma* application mentioned above when you have done, as I have found Windows 10 does not re-load gamma tables after changes here.

You can associate several profiles with a display device. For example, you may sometimes plug your projector into Display 2's port and at other times plug in a monitor. If you associate profiles for both devices with display 2 and set the default as the one you most commonly use, you can easily switch between profiles. To do this:

1. Right-click on a blank area of the desktop and select Display Settings. The *Display* control panel will appear.
2. Click a tile at the top of the page to select the display to change.
3. Select the Colour profile from the drop-down list.