

Screen Calibration

The following information is provided to assist with calibrating screens in order to view photographs of mineral specimens accurately. It is not an exhaustive review of the subject but is intended as an introduction to the concept of screen calibration and to raise awareness of the difficulties of viewing images accurately.

Gamma

The gamma setting on monitors determines how brightness and contrast are interpreted. It is a numerical value and has different default settings for Mac and PC systems, with 1.8 as the recommended setting for Mac and 2.2 for PC's. Some PC users prefer a lower setting of 1.8 or 2.0 depending on personal preference but the default settings are a good starting point. Make sure this value is set appropriately before adjusting anything else as it can dramatically affect the saturation and hue. Note that other types of screens, such as those on tablets and smartphones, may not have this setting.

Brightness, Contrast and Colour Balance

Most screens have a variety of brightness, contrast and colour balance settings which can be adjusted as required. Monitors may be adjusted using both the buttons/menu options on the monitor itself and using software which controls the display settings. Tablets and smartphones usually have a Display Settings menu that also allow these parameters to be adjusted.

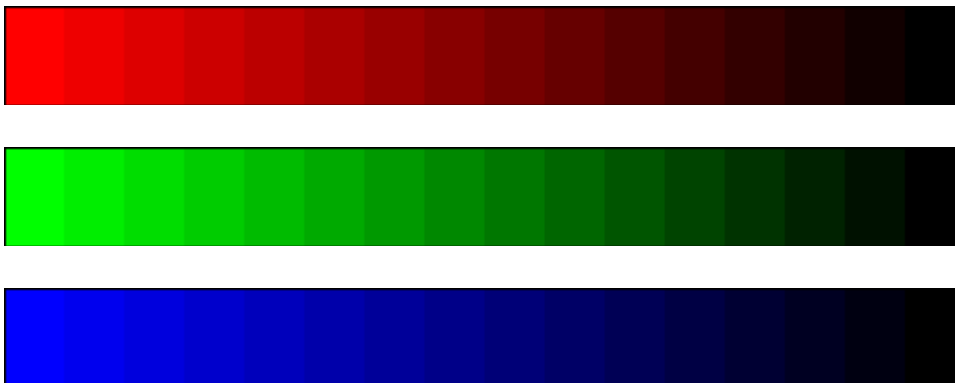
The following images can be used to help adjust screen settings so that images are displayed more accurately. Each setting has an effect on the other parameters so it may be necessary to go back and forth between adjusting two or more parameters a number of times before it starts to look better.

(1) Test image for tone and greyscale



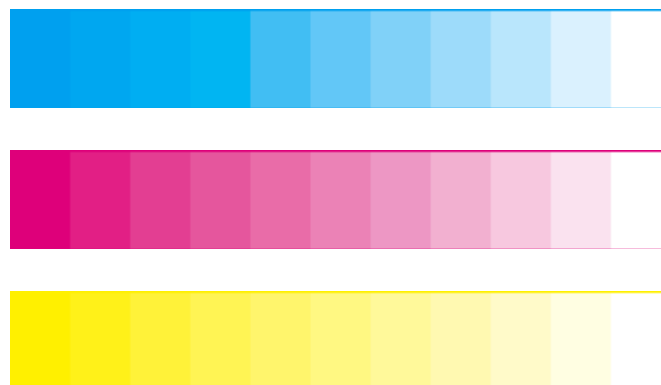
- In this image you should be able to see 20 different sections of equal width and different tone, each one varying in tone by about the same amount.
- The darkest section should be pure black.
- The lightest section should be pure white.
- There should be no hint of colour anywhere along the grey spectrum.
- If you don't see 20 different tones, you may need to lower the contrast.
- If black is not pure black, you need to darken the display by reducing the brightness (or adjust the black point if this setting is available).
- If white is not pure white, you need to increase the brightness (or adjust the white point).
- If both black and white are not pure, try to boost the overall contrast or adjust both, the black and white points.
- If there is a hint of colour in the greyscale, try and adjust the colour balance.

(2) Test images for colour (Red, Green and Blue)



- For each of the colour strips you should be able to define 16 different colour tones.
- If you can't distinguish the tones towards the dark end in any of the strips, you may need to lighten that respective colour or darken the other two colours.
- If you can't distinguish tones towards the light end of a strip then you may need to darken that respective colour, or lighten the other two colours.
- Adjusting saturation controls for the individual colours may also help if you have these options available.
- It is not uncommon for people to find it difficult to distinguish the darker tones. Therefore if you are having difficulties in getting the settings right for the darker ends it is worth asking a second person to have a look in case the issue is your interpretation rather than the screen's display.

(3) Second test for colours (Cyan, Magenta, Yellow)



- You should be able to see 11 clearly defined colour levels in each strip and there is a relationship between how these are displayed and how Red, Green and Blue colours in the previous test are displayed.
- If the deepest yellow patches are indistinct from each other, your darkest blue is probably too close to black.
- If the deepest magenta patches are indistinct from each other, your darkest green is probably too close to black.
- If the deepest cyan patches are indistinct from each other, your darkest red is probably too close to black.

If you have access to a good quality colour printer that is good at replicating true colours then you can also print out these test images and compare the print out to what you see on the screen. If they look very similar then this is a good indication that your screen is correctly set up. Note that making changes to your screen settings will not affect the way the images are printed out as the printer settings for colour management are completely separate to the screen settings.

More advanced adjustments such as black and white points, individual colours and saturation are normally only available using software. Many computer systems come with colour management software pre-installed so check under the advanced display settings to see what is available. An internet search of 'colour management software' returns a wide range of options for purchasing software if required.

We hope this is a useful introduction. There are numerous websites that provide more detailed information so for further reading try an internet search of 'screen calibration' as a starting point.