



Calibrating and Profiling Your Monitor

For this module, you will need:

- Eye-One® measurement device
- Counterweight (used for LCD screens only)



Introduction

This training module will teach you how to use your Eye-One or Eye-One Display to calibrate your monitor. Whether it's an LCD or CRT monitor, you're going to be able to get great color on-screen—as long as you follow a few simple steps.

You will learn about:

1. Proper conditions for monitor viewing
2. Supporting multiple monitors
3. Building a monitor profile
4. Attaching Eye-One to your display
5. Setting Whitepoint and gamma
6. Setting brightness and contrast
7. Using monitor profiles in your operating system

Proper Conditions for Monitor Viewing

Before we begin with the software, let's establish some of the conditions necessary for accurate monitor color:

New, modern displays are better

First, you need to use a good quality monitor, without any noticeable color defects. Ideally, the display should also have contrast, brightness and Whitepoint controls—more about that later.

Ambient light should be reduced

Second, the surrounding lighting is important. Monitors perform best with low ambient light. Reduce room and task lighting to a low level and avoid direct illumination of the screen.



Set up your computer

Third, you need to set up a few things on your computer. If you have used Adobe® Gamma or any other software for monitor profiling, disable or uninstall it. Let your monitor warm up for 30 minutes before profiling and turn off any energy-savers that might dim or blank the screen.



Correct viewing conditions

Finally, for viewing your originals or prints, it's a good practice to have a graphics light box handy. This will allow you to control room lighting but still provide bright, standard lighting for comparing prints on screen.

Supporting Multiple Monitors

Eye-One can only profile one display for each video card you have installed on your system. If you have two monitors, but only one video card, you should choose one monitor as your "color critical" display, leaving the other for tools, palettes and other uses that are not color-critical.



Color-critical

Non Color-critical

Turn on the primary (color-critical) monitor and boot up the workstation. Follow the steps for calibrating and profiling a single monitor. When the process is complete, use the Monitor or Display control panel to select the monitor profile you just made.

For additional information on multiple monitor configurations visit www.i1color.com.

Building a Monitor Profile

To begin building a monitor profile, make sure your Eye-One device is plugged in and launch Eye-One Match.

From the main interface you can select the type of device that you want to profile. It also offers a status panel on the left and interactive Help options on the right. Select the icon of the monitor and click the right arrow in the bottom right corner of the screen to continue.

Easy mode

Easy mode is for quick and simple profiling of a display. In this mode, Eye-One Match won't give you any options for brightness, contrast, gamma or Whitepoint. Instead, it will default to the native settings for your operating system, video card and display.

Select the Easy option and click the right arrow to continue.

Choose your monitor type, either LCD or CRT. Click the right arrow to continue.





You will be prompted to calibrate the Eye-One device. Simply place it on a matte black patch—be sure to use something that is not reflective. The interface will indicate that the device is calibrating. When calibration is complete, click the right arrow to continue.



CRT Monitor



LCD Monitor

Now the device needs to be positioned on the monitor. For CRT displays, use the suction cups to attach the unit directly to the glass. If the suction cups or the monitor are dusty or dirty, the device may not stick. In this case, carefully clean the screen and the suction cups with a cleaning cloth and a little water or alcohol.

For flat panel displays, simply rest the device against the screen using the counterweight to keep it in position. Do

not attach using suction cups on an LCD display.

Position the Eye-One device as close as possible to the center or “sweet-spot” of the monitor. You will get the best profile in this position.

Click the right arrow to continue and the software will automatically begin the profiling process. The status bar in the lower right corner will indicate the progress. It only takes a minute for the monitor to be profiled. It’s that easy.

The last screen shows the default name for the ICC profile and allows you to change it. If you are going to rename the profile, this is the time to do it. Click the right arrow to save the profile and automatically set it as the default display profile in the operating system, or save the profile and then manually navigate to the control panel and set it up yourself.

Advanced mode

Advanced mode is still very easy to use, while allowing you to select and deselect monitor controls including brightness, contrast and individual RGB channel controls for Whitepoint. Most graphics professionals will want to use this mode.

Determine which controls are supported on your monitor. Check the monitor on-screen display (OSD) or control panel for brightness, contrast and individual channel adjustments for RGB Whitepoint (or color temperature.) We will cover all three of these controls.



Note: If Eye-One Match is launched on an Apple LCD monitor, it won't show the contrast, brightness and Whitepoint adjustments. However, it is possible to change the settings for Whitepoint and gamma in the advanced mode.

Select the Advanced option and click the right arrow to continue, and then choose your monitor type, either LCD or CRT. Calibrate your Eye-One device and position it on your right monitor as described earlier in the Easy mode section. The software will advance to the next window automatically.

At this point, two drop-down menus allow you to define target settings: Whitepoint and Gamma.

Whitepoint

Whitepoint, measured in Kelvin, represents the color of the white light used for viewing. Each type of light source has a different Whitepoint. For example, fluorescent lights have a different Whitepoint than incandescent lights. It's important to standardize your viewing conditions because color will appear to change depending on the Whitepoint. The wrong Whitepoint setting will give incorrect color.

The monitor Whitepoint menu offers seven options. Eye-One Match is very flexible, and it can handle any standard Whitepoint. We recommend that you adjust your display to the standard for your industry.

- Warm White (5000)
- 5500
- 6000
- Medium White (6500)
- 7000
- Cool White (7500)
- Native Whitepoint

Different industries and regions have standard Whitepoint viewing conditions. 5000 Kelvin and 6500 Kelvin are the most common viewing standards. In this example, we're working with print graphics, so we'll choose 5000 Kelvin, also known as Warm White. This setting may initially appear more dim and yellow than the monitor's native Whitepoint. Don't worry; your eyes will soon adjust to the new Whitepoint.





If Whitepoint adjustment is available in your monitor's control panel, adjust the Whitepoint to the desired setting. If the monitor setting defaults to 9300K, we will change it to 5000K to match our industry standard.

Gamma

The Gamma menu offers five different selections. Usually, you're going to choose between one of two standard settings:

- Windows Standard (2.2)
- Macintosh Standard (1.8)

Gamma values refer to the gradation curves used to represent the midtone brightness of the display. The higher the gamma number, the darker the midtones appear on screen.

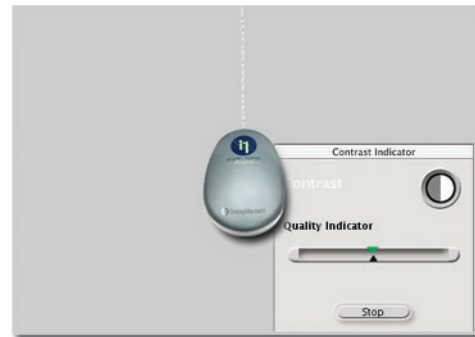
Mac platform monitor gamma is native at 1.8, while PC systems are native at 2.2. Ideally, in mixed Mac and PC environments, the same gamma settings should be used. In our example, we're using a Mac, so we'll choose the 1.8 setting.

Contrast

Manually adjust your monitor contrast to its maximum to provide a good starting measurement for Eye-One. Click the Start button in Eye-One Match to begin calibrating the contrast.

There is a stationary triangle at the bottom center of the slider indicating gray midpoint and a colored triangle that moves above it, indicating the current contrast quality. If the colored triangle is

to the right of center, the contrast is too high and needs to be decreased. If it is to the left of center, the contrast needs to be increased.



Manually make small contrast adjustments and wait until they register in the software. Adjust until you're as close as possible to the grey midpoint. If your monitor's OSD contrast adjustment dialog is open when you're adjusting contrast it can affect what the Eye-One device is reading. Wait until the dialog closes before making further adjustments.

Brightness

On the Calibrate Brightness screen, click the Start button and follow the directions.

Begin by lowering the brightness of your monitor to 0 or the minimum. Even if





your monitor goes completely dark, you can work around this by pre-positioning your cursor over the Measure button in the Brightness dialog. Click the Measure button. Eye-One Match will take a reading and indicate the new brightness value.

Manually adjust your brightness to this new value and click the Measure button again. As you repeat this process, your values should get closer and closer until the best brightness value for your monitor has been determined.

Click on Stop and you will be returned to the main interface. Click the right arrow to continue.

Calibrate RGB

RGB adjustments allow you to control the Whitepoint of your display. There are two modes. If your monitor has a color temperature or Whitepoint control, choose RGB Presets. If your monitor has controls for each individual color channel and you want a more advanced calibration choose RGB Controls. Otherwise Eye-One Match will take care of this automatically.

RGB Presets

The Eye-One device should still be positioned on the monitor. Click the Start button to begin.

The software flashes a series of colors on the monitor, taking readings of each. The data collected is used to determine the current color temperature of the monitor, based on selections made during the initial calibration.

In the Whitepoint Indicator dialog box, the RGB Preset is displayed with the Current Whitepoint reading of the monitor. Ultimately, you want them to be the same or as close as possible, within about 100 Kelvin.

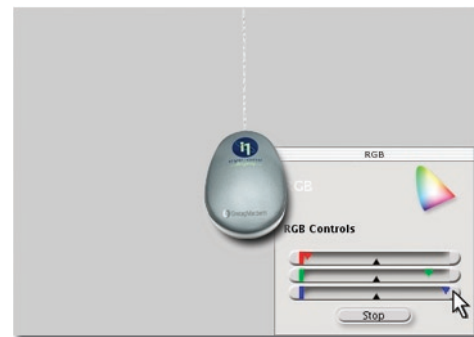
Click the Stop button when the software progresses to the final white screen and displays the current monitor Whitepoint.

Click the right arrow to continue for Eye-One Match to build your custom monitor profile. Save the profile and Eye-One Match automatically sets it as the default.

Manual RGB Controls

The Eye-One device should still be on the monitor. Click the Start button to begin.

The software flashes a series of colors on the monitor, taking readings of each. The data that is collected is used to determine the current color temperature of the monitor.



In the RGB dialog box you will see RGB Controls with one slider for each of the three channels. The goal is to align the colored sliders with the stationary center points.



Manually adjust your monitor's color controls one channel at a time, starting with the color that is furthest from center. As you adjust one color the other two will move closer to the center points, compensating for the adjustment. Wait for your monitor's OSD dialog box to disappear before assessing the sliders. Work gradually, using small increments.

If necessary, repeat this process with the other color channels until they are all centered and then click the Stop button.

Click the right arrow to continue to the next step. The software now completes the calibration based on the Contrast, Brightness and RGB settings you just made. It then automatically builds your custom monitor profile. Save the profile and Eye-One Match automatically sets it as the default.

Using Your Monitor Profile

Congratulations! You've used Eye-One Match to create a custom monitor profile, save it and set it as your default. Now you need to verify that your applications are using this profile. To confirm that the profile is set to default, you'll need to check the appropriate control panel on your operating system.

Path to Your OS Control Panel:

For Mac OS 9, go to Control Panels > Monitor

For Mac OS X go to System Preferences > Display and then click the Color Tab.

For Windows go to Start > Control Panel. Select Display and click on the Settings tab. Click the Advanced button and then click the Color Management tab. Having this setting available is a prerequisite for accurate soft proofing.

You now have reliable color on your newly calibrated monitor. If want to get this same accurate color for your scanner, printer and projector remember that your Eye-One Display package contains a voucher towards an upgrade to an Eye-One Pro package. To learn more about these topics, as well as using your ICC profiles in desktop publishing applications, check out our other modules at www.i1color.com.

