

# Profiling Digital Projectors

## PART 2

*This is the second in a series of articles addressing the preparation of equipment for digital competition. In this article I'll walk you through the procedure for calibrating and profiling your system in preparation for a competition. I'm going to focus primarily on how to use the **Spyder3Elite** system (Datacolor). As I mentioned last month, this is the least expensive of the two systems available for this work. Along the way, I'll point out what I think are the significant differences from the much more expensive **i1-Beamer** system (X-rite).*

**I'd like your comments on these articles! Especially regarding issues you think have either been overlooked or not presented in a sufficiently clear manner. Please send questions, suggestions or recommendations to me at: [fred@marklandimaging.com](mailto:fred@marklandimaging.com).**

Fred Drury

One of the points we made in the last article was that we must take a “systems approach” in preparing for a digital competition. What the judges and audience see is affected not just by the digital projector alone, but rather it is a consequence of the combination of the projector, laptop, screen, and the ambient light in the room. Therefore, we strongly recommend that the calibration and profiling process be done with the equipment and in the room that will be used for the competition—ideally under ambient light conditions similar to those that will prevail at the time of the competition.

Once the system is set up, the projector and laptop should be turned on and allowed to warm up for about 30 minutes. During this time, review the projector controls and reset them to the factory defaults if necessary.

The first step in the process is to calibrate the system luminance. Digital projectors generally put out a lot more light than transparency projectors (this is the reason matte screens are preferred for digital competition). The system luminance is affected by the light output of the projector and how it is reflected by the screen. PSA has established a good standard:

1. Project a 1024x768 pixel white image.
2. Using a light meter that measures reflected light, and standing at the judges location, measure the light being reflected from the screen:
  - a. Adjust the projector brightness for a

light meter reading of as close as possible to 9 EV. A reading between 8.5 and 11 EV is acceptable.

3. If a light meter is not available an in-camera meter can be used. On the camera, set the ISO to 200, meter to spot, exposure mode to shutter priority, and shutter speed to 1/30<sup>th</sup> second.
  - a. Adjust the projector brightness for an in-camera aperture reading of as close as possible to f5.6. A reading between f4.8 and f11 is acceptable.
4. Whichever method is used (light meter or in-camera meter), it's a good idea to keep a record of the reading—it's part of the system calibration and the same setting should be used in the future.



The next step is to connect the **Spyder3** instrument to one of the laptops' USB ports and then open the **Spyder3** software. The first time you use the software; you'll be asked for your name and product serial number and then asked to register the product. The first “working” screen is titled “New Monitor”—click “Next” at the bottom right corner which takes you to

the “Display Type” screen (*Figure 1*). Select the correct device, proceed to step 4 below.

adjusted the system Brightness, so best choice is to leave these controls unchecked.



In the future (after the first use), here is the procedure:

1. When you open the software, the first working screen will be *Figure 2*, the “Check Cal” screen.

5. Again click “Next” to *Figure 5*, the “Identify Color Controls” screen. The best choice is to leave these controls unchecked and click “Next.”
6. The “Method of Attachment” screen applies only to monitor calibration, so click “Next” to the “Current Settings” screen.



2. If you want to work on a projector, go to the command line and select <Go><Edit Display Information>, which will take you to the ‘Select Display To Edit’ screen (*Figure 3*).
3. Click “Next” and that will bring you back to *Figure 1*, the “Display Type” screen where you choose the projector icon.

7. Your settings in the lower section of this screen should be identical to *Figure 6*, with the exception of the “Display” setting. Now turn the “Continue with these settings” radial button “ON,” and click ‘Next.’ These, along with the Brightness adjustment made earlier to the projector, constitute the ‘calibration’ process. The next steps setup the sensor to build the profile.



4. Then “Next” takes you to the “Identify Controls” screen (*Figure 4*)—you have already

8. *Figure 7* shows how the sensor fits into

the adapter. I use a spare lens plate (Kirk Enterprises or Really Right Stuff) to securely connect the sensor assembly to my ball head (there's a properly sized threaded hole in the bottom of the adapter). Click "Next."



Figure 8



Figure 9

- The next two screens (*Figures 8 & 9*) show how the sensor should be positioned so it can 'read' the patches that are going to be projected onto the screen. It should be 12" in front of the center of the screen, with the sensor axis perpendicular to the screen. The instructions include the caveat: "Please follow these instructions within reasonable accuracy." With some setups, such as very large screens, it may be impossible to raise the instrument high enough to have it perpendicular to and directly in front of the screen. The objective should be to get as close as practically possible to the desired configuration. (*Note: the X-rite i1 Beamer is different; the sensor*



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Figure 10

is attached to the Beamer, and is pointed at the screen. An interactive system helps you position the sensor—you want it looking (more or less) at the center of the screen. With this system I normally set the Beamer on top of the projector.)

- At this point, the software takes over and the process is automatic. A series of color patches are projected and are "read" by the sensor. The software uses these values to create the projector system (projector- laptop-screen-ambient light) profile.
- The final step is to name the system profile. In *Figure 10*, the 'system' name includes the projector, laptop and location.

Clearly there are quite a few steps in this process. Like most such processes, the procedure must be carefully followed in order to get the best results. However, once you've had a little experience, the procedure is quite simple, and will become a matter of routine, taking no more than 10-15 minutes. ☺

**Remember: if you have questions, suggestions or recommendations concerning these articles, please sent me an E-mail at: [fred@marklandimaging.com](mailto:fred@marklandimaging.com). The next column in this series will be dedicated to your feedback and questions.**

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