

## How to Calibrate a VideoEq Pro using CalMAN v4

By Jamie Miller, Technical Support – July 1, 2010

The VideoEq Pro is a fantastic piece of hardware that will most certainly produce a reference quality picture on your display, be it in your home theater, office, operating room, or editing bay in Hollywood. Full control of the Color Gamut and Grayscale allows a trained calibrator to insert one of these in the video display input path and voila – perfect picture!

Here is how I calibrate the VideoEq Pro:

### Initial Setup:

#### 1. On the display or projector, connect:

- a. The VideoEq Pro output to the display HDMI Input.
- b. The HDMI output of my favorite video generator (Quantum Data 780 works well) to the VideoEq Pro input.

#### 2. On my laptop, connect:

- a. To the QD 780 video generator via USB port. Obviously, you could sub in a DVDO Duo here and pull the patterns from that.
- b. To my favorite color meter (Klein K-10 is my choice) via USB port.
- c. To the VideoEq Pro via USB port.

#### 3. In the CalMAN V4 software:

- a. Load the “Interactive\_VideoEQ.xml” workflow (call for availability).
- b. In Meter Settings, select the Klein K-10.
- c. In Source Settings, select and Start the Quantum Data780.
- d. In Interactive Display, select and Connect to the VideoEq Pro.

### Calibration Procedure:

**1. Pre-Cal Capture** - Capture the pre-calibration performance, for documentation.

**2. Initial Display Setup** – Baseline the display.

- a. Select a picture mode close to D65.
- b. Adjust black level and white level (dynamic range).
- c. Select native or wide color gamut (fully saturated), if available.

- 3. Adjust Grayscale, Interactive** - Drag and drop the grayscale measurement points to the target points on the RGB Balance chart. Here is a note from the product developer:

*"I always do grayscale first. There are a couple of valid reasons for doing it this way. One is that the LUT table is an additive operation, and therefore will offset the entire color gamut. The other is that the LUT will compensate for, and linearize the gamma so that the CMS adjustments will be (theoretically) correct at all luminance levels. If you do the CMS adjustments and then do the grayscale, it would be surprising if the CMS still measured correctly, especially at levels other than the cal point."*

*"I always work top down. I've just found that top down seems to be the easiest operationally."*

- 4. Adjust Color Gamut, Interactive** - Drag and drop the primaries to their target points on the chromaticity diagram (Rec 709 for HD). Here is a note from the product developer:

*"I generally do CMS controls at 80% stimulus level, but if you've done your grayscale and gamma correctly, it shouldn't matter. CMS color order should not matter, as the controls are truly independent. I usually work left to right and do red, green, blue, cyan, magenta, and yellow."*

*"I have never tried to adjust the white point with the CMS controls on the VideoEq Pro. I would be surprised if it did anything. The CMS controls are a multiply operation and the white point is effectively zero... Anything times zero is still zero. Other systems are different though."*

- 5. Post-Cal Capture** - Capture the post-calibration performance, for documentation.

Nine times out of ten this does the trick just fine and produces a picture comparable to those found on the very highest end displays found in Hollywood, matching the HD standards with little to no error. Color reproduction from top to bottom, exactly as the artist intended.

With CalMAN v4, your favorite tools, and the VideoEq Pro, you'll be making beautiful pictures in no time!