



**Flanders
Scientific
Inc.**

FSI Calibration Guide

**Using CR100 / LightSpace / BoxIO
v1.3**

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We suggest you begin by setting your FSI monitor to the default profile. *Please note this returns all settings and preferences to factory default.*

Menu > System > Load Profile > Default.

When prompted, confirm by selecting Yes.

Bypass the 3D LUT in the monitor's Color Management menu.
Color Management > LUT Bypass > 3D LUT.

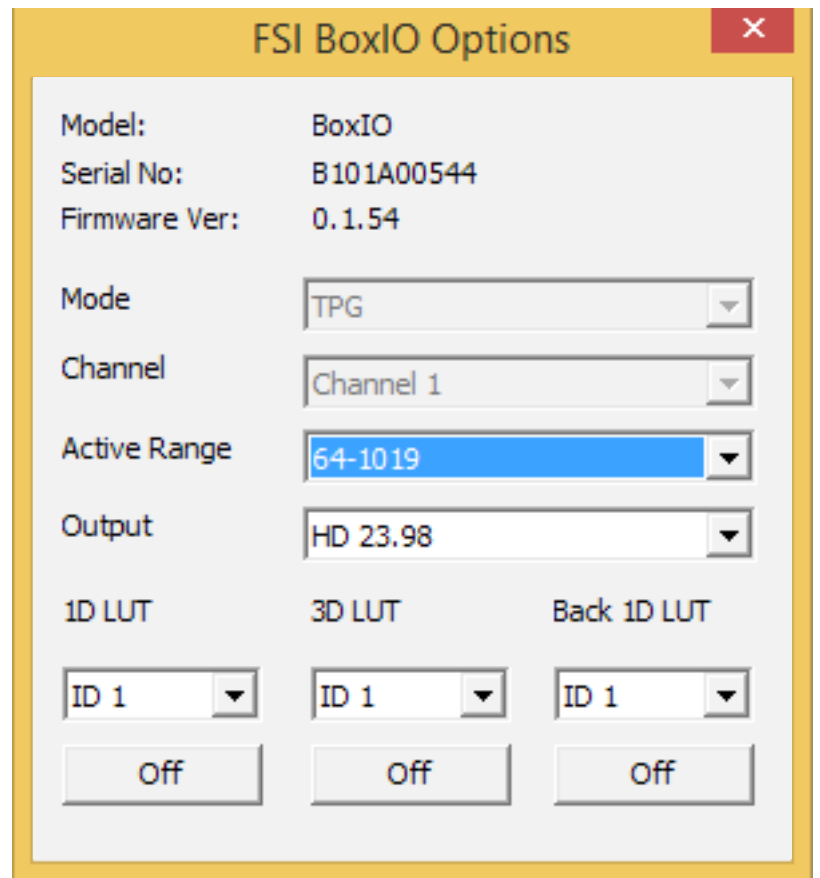
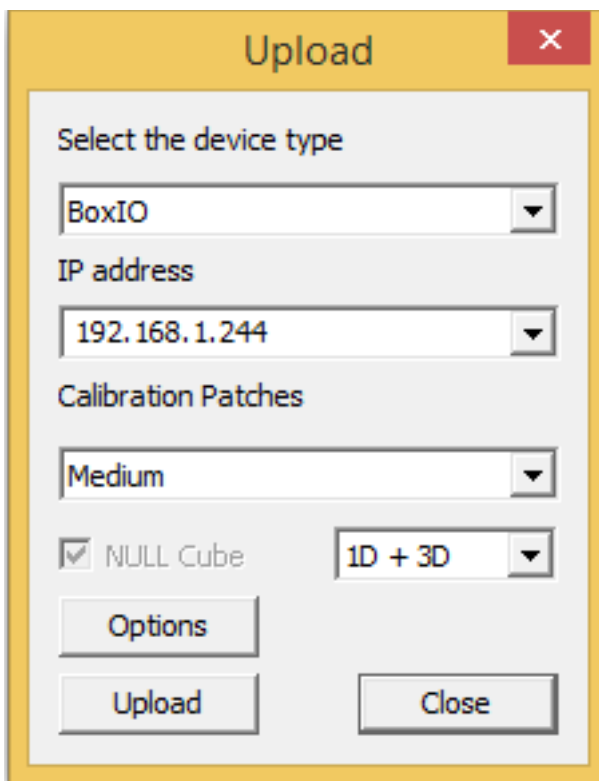
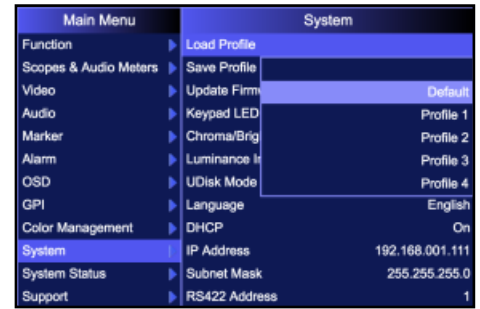
Start LightSpace CMS and navigate to File / Upload and select BoxIO from the 'Select the device type' drop-down window.

Enter the IP address of your BoxIO Unit.

Set Calibration Patch Size to Medium.

Go to Options and ensure that LUT positions are Off and that the Active Range of BoxIO matches the monitor range (monitor default is 64-1019)

Close the options menu and click Upload. Close the Upload Menu.

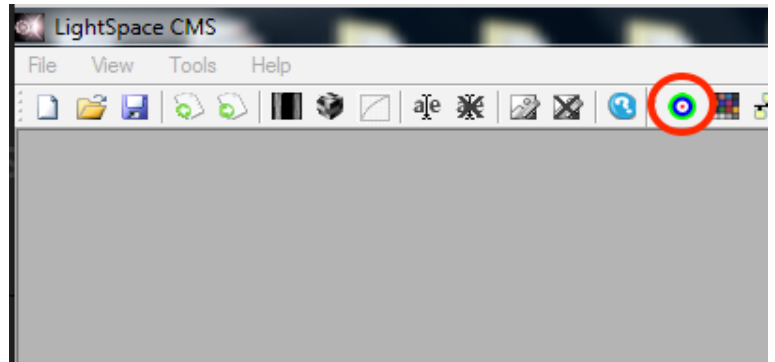
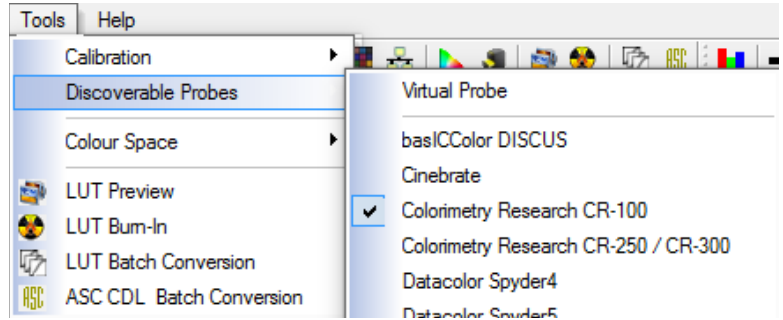


With the CR100 connected return to LightSpace and click on the tools menu.

Select Discoverable Probes and click on Colorimetry Research CR-100 as your calibration probe. Make sure that Virtual Probe is not selected.

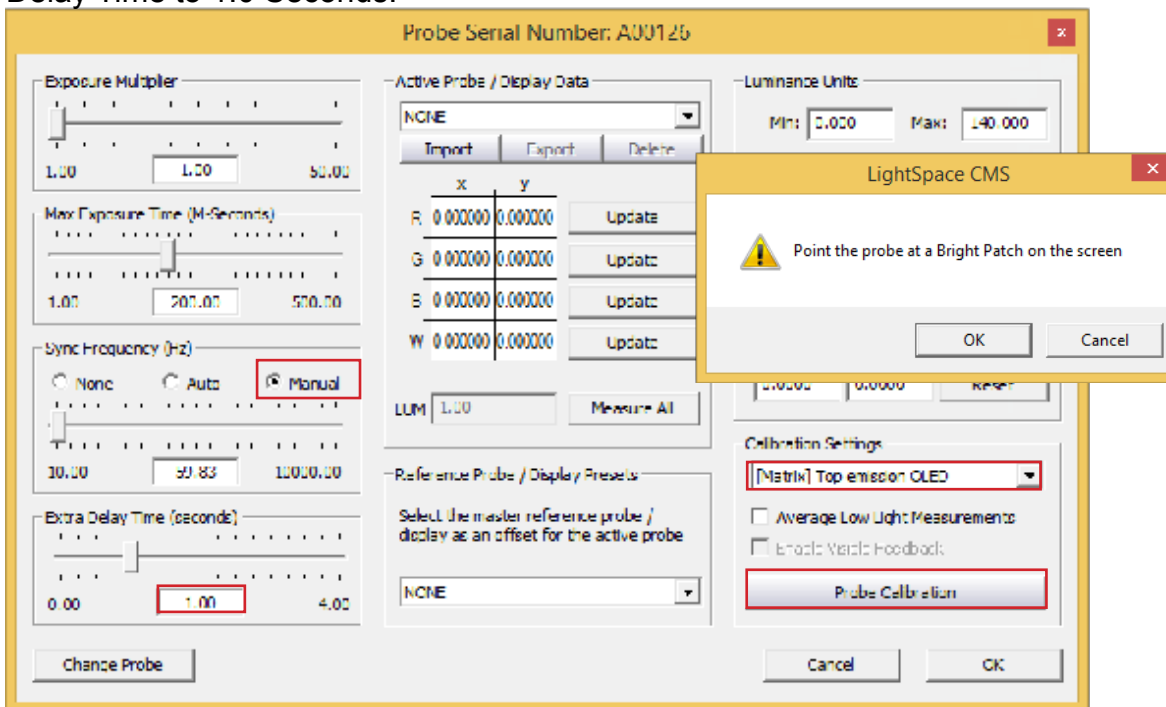
Next click on the Calibration Interface icon in Lightspace and then click on the Profile button. Select Grey Scale Only, which will measure greyscale, red, green, and blue. We suggest starting with this quick profile approach before attempting larger display characterizations as it will typically reveal any signal path or equipment settings issues that should be addressed before continuing. Additionally, on displays with very linear underlying behavior a Quick Profile based calibration may be all that is necessary to achieve very good results. If a greater degree of accuracy is needed or desired we suggest a 17x17x17 or 21x21x21 Display Characterization. See appendix for details.

In the Calibration Interface window select Options. Make sure the CR100 serial number is listed at top of the options window. Set Extra Delay Time to 1.0 Seconds.



To Sync the CR100 set Sync Frequency to Manual and select Probe Calibration. Follow the prompt and click Ok.

Under Calibration Settings, select the correct calibration matrix that is stored on the CR100.



Next place your CR100 probe at the center of the monitor and press the Measure button in the Calibration Interface window. A dialog window will ask you to give your profile a name, select something easily identifiable and press OK to begin the profiling process.

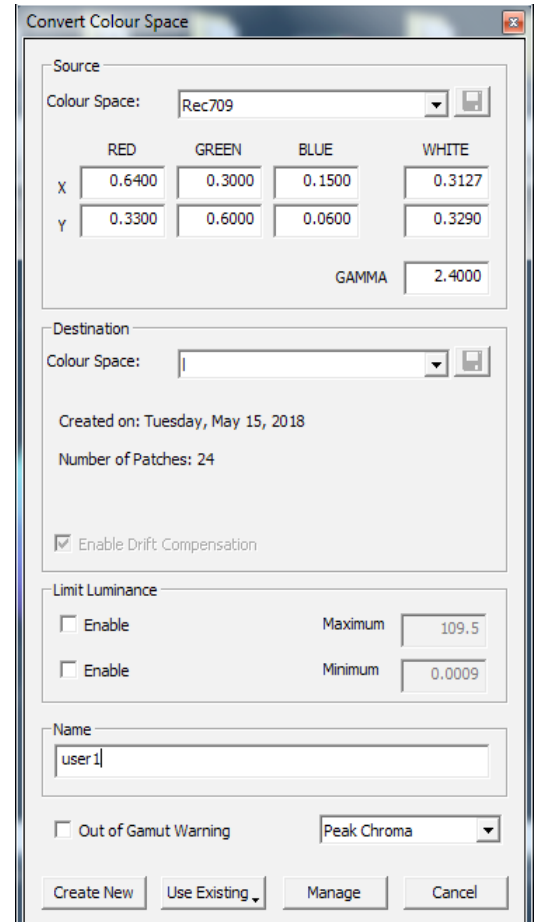
Once your profile completes select the Convert Colour Space icon.

In the Convert Colour Space window enter user1, user2, or user3 to match the desired LUT position on the monitor.

From the source dialog select your target colour space from the colour space dropdown menu (e.g. Rec709, BT.1886, etc.). From the destination dialog select your calibration profile. Then click create new to generate your calibration LUT.

If calibrating a DM250 OLED running firmware version 2.0.0-2282 or later make sure to select Enable Limit Luminance Maximum and type in 100cd/m2 or any other desired target peak luminance level.

Click on File -> Export and select FlandersScientific17.cfe as your export format, then click export. Verify the file is named user1.cfe, user2.cfe, or user3.cfe before loading to monitor..



Copy this LUT file. Finally plug the provided update cable into your computer and monitor, paste the file onto the monitor (shown as mass storage device when connected), and Select Update LUT (or Update CFE) from the Color Management (or Display Alignment menu) on your monitor.

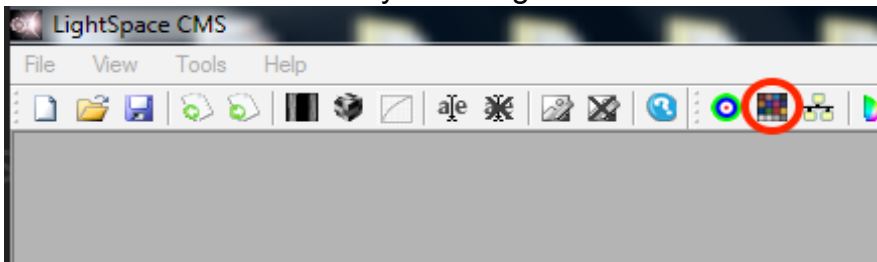
When the LUT update is complete set LUT Bypass back to None on the monitor and then select your corresponding LUT position from the Color Management / Display Alignment menu to activate your LUT.

**Please note that as of firmware 2.0.0-2282 LightSpace generated LUTs can only be saved to user1, user2, and user3. Saving to other memory positions is not supported.*

Appendix: Tips and Tricks

Longer Profiles Using Display Characterization

To optimize results beyond what a Quick Profile calibration option can provide a larger Display Characterization patch sequence can be used. Please use either a 17x17x17 or 21x21x21 Display Characterization for optimal results. To access the Display Characterization workflow select the Display Characterization icon directly to the right of the Calibration Interface Icon.



DCI P3 Calibration (applies to firmware 1.0.04-2252 and older only)

If calibrating to a P3 target please note that the P3 setting on the monitor activates a unique gamma and white balance response separate from the standard settings. One of the two methods below may be used for accurate P3 calibration:

1. You can follow the standard procedure outlined above and save your custom P3 calibration to one of the USER positions on the monitor (e.g. user1, user2, or user3). If using this method do not save to the P3 position on the monitor as you will get a poor result.
2. The monitor may be placed in P3 mode and a unity LUT can be loaded to the P3 position using filename dcip3.cfe. Then you will profile without bypassing the 3D LUT (bypass LUT set to none). When complete you will override the unity LUT loaded into the P3 position with your new 3D LUT.

OLED Black Level Setup and BT.1886 Calibration

The default black level of OLED monitors is effectively 0 nits (cd/m²), which is well below the accurate or repeatable thresholds of most measuring devices. A BT.1886 EOTF on a display with a black level of 0 nits is actually equal to a 2.4 gamma response. For both of these reasons it is advisable to calibrate to a target of 2.4 gamma when calibrating an OLED with black at 0 nits so that noise or junk readings are not being factored into your calibration's EOTF. Once calibration is complete you can use the "bright" knob/key on the monitor to adjust your black level higher if desired. When calibrated to a target of 2.4 with black at 0 the brightness rotary knob control maintains a BT.1886 response for any given black level. The appropriate black level is a function of both viewing environment and personal preference, but a range of 0 nits to no more than 0.05 nits is generally advisable.

Probe Sync

The probe calibration function in LightSpace will automatically determine a compatible probe sync frequency for the CR100. However, you may be able to achieve more repeatable / accurate results by entering a probe sync frequency manually. Setting probe sync to match the frame rate of your test pattern generator (e.g. Resolve framerate) is a good alternative to the automatically determined probe sync frequency. Contact FSI support for further details on probe sync settings.

Appendix: Tips and Tricks

Advanced Workflows

Custom 1D + 3D LUT and other advanced workflows are possible with FSI monitors. For questions or details on advanced settings, workflows, and capabilities please contact our support team for personalized assistance:

Support@FlandersScientific.com