



**Flanders
Scientific
Inc.**

FSI BoxIO & LightSpace Calibration

08.10.2016

Flanders Scientific, Inc.
6215 Shiloh Crossing
Suite G
Alpharetta, GA 30005
Phone: +1.678.835.4934
Fax: +1.678.804.1882
E-Mail: Support@FlandersScientific.com
www.FlandersScientific.com

LightSpace CMS can be integrated with the BoxIO LUT Box for accurate Display Profiling, LUT based Calibration, and Look Management.

Operation of the BoxIO LUT Box with LightSpace CMS is comparatively simple, although there are a range of different options and capabilities which must be set correctly if the expected end result is to be attained.

BoxIO can operate in 3 modes:

- **Mode 1** has a single pipeline with 33^3 3D LUT processing
- **Mode 2** has two completely independent pipelines, each with its own 17^3 3D LUT
- **Mode 3** is the Test Patch Generator

In all 3 modes the active video range can be specified independently as 64-940, 64-1019, or 4-1019.

In mode 1 you can specify which SDI input is your active source. The output is mirrored on both SDI outputs.

In mode 2 you can independently specify which SDI input is the source to your process pipeline.

The imaging pipeline in both mode 1 & mode 2 is 1D -> 3D -> 1D, and each LUT position can have 16 stored LUTs.

The 'Options' menu shows and controls the current state of BoxIO and its configuration. The currently selected 1D, 3D and Back 1D LUTs, selected from the drop-down lists within the 'Options' menu, will be loaded when the 'Upload' button on the main Upload menu is pressed. Only the LUTs selected from the main 'Upload' menu will be uploaded (or set to null, if that option is ticked) on upload. Any other LUT can be manually set 'on' or 'off', as required from the 'Options' menu.

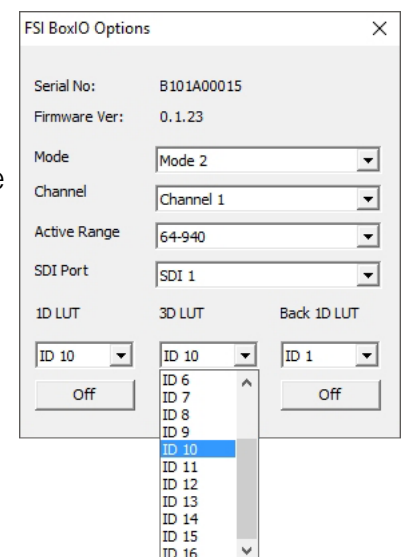
A normal operation would be to load 1D+3D LUTs, extracted from the currently active LUT within LightSpace. To do this it is good practice to first upload a NULL cube to ensure the used slots are empty. In this case the Back 1D LUT will not be affected. If desired it can be switched on or off in the options GUI.

Initial Operation

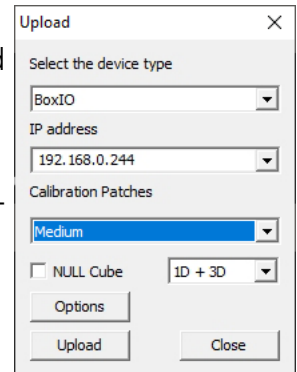
- Connect BoxIO to the LightSpace PC via the LAN cable, and start LightSpace CMS. See page 2 of BoxIO User Manual for details on connecting to BoxIO.
- Navigate to File/Upload, and select BoxIO from the 'Select the device type' drop-down window.
- Enter the IP Address of your BoxIO Unit.

Before proceeding further, the additional settings and configurations within the 'Options' menu need to be correctly setup. This menu 'reads' the present BoxIO configuration when first connected and accessed, and then allows the various settings to be changed as required.

- Select the desired Mode, Channel operation, Video Range, SDI Port, and the LUT slots to be used.



- Close the 'Options' menu, and continue with the main 'Upload' menu.
- If there is no LUT active with LightSpace the NULL Cube option will be ticked and greyed-out, but is operational.
As no other LUT is available the ONLY option is the NULL Cube
- To make sure no LUT is active within the desired BoxIO LUT slot select 'Upload', with the NULL Cube box ticked.
To clear all the three LUT Slots, the NULL Cube will need to be uploaded to all three slots - 1D+3D, and Back 1D
- Using the 'Calibration Patches' option select the desired patch size to use for profiling.
- Close the 'Upload' menu.



The Upload menu is located under 'File/Upload', and contains an 'Options' button to access additional user settings, which must be set as required to ensure the expected end result is attained.

Profiling Operation

To use the BoxIO as a Patch Generator navigate to the desired profiling mode - Calibration Interface, or Display Characterisation.

When the patch window is active (the LightSpace CMS internal floating patch window has been made active by clicking the small colour display box when using Quick Profiling or Manual Measure modes) the output of the BoxIO will mimic the colour displayed, using the patch size pre-set via the 'Upload' window.

Profiling can then be performed as normal, using the probe connected to LightSpace, and with the BoxIO displaying the required patches on the display being profiled.

LUT Upload

- After profiling, a Calibration LUT can be generated as normal.
- Navigate back to the 'Upload' menu and make sure the 'NULL Cube' box is unchecked.
- The present LUT displayed within LightSpace can be 'Uploaded' to the selected LUT Slot within BoxIO.

There are three LUT slots within BoxIO, and the 1D+3D combination is the normal configuration to use for display calibration with the Back 1D LUT left empty. The Back 1D LUT could be used to pre-set a display's grey-scale and gamma as a first pass, and then the display could be re-profiled with the Back 1D LUT active, and the 1D+3D LUT generated from the second profile pass uploaded for the final gamut calibration.