Flanders Scientific Inc.

XM551U, XM651U, XM650U Calibration

Using CalMAN with Direct LUT Upload Capability

NOTE BEFORE STARTING:

3D LUT based calibration with CalMAN is currently only advised for SDR calibration targets. For HDR calibration please see our other XM OLED calibration guides. This guide will be updated when a newer version of CalMAN with optimized 3D LUT calibration for HDR is released.

Pre-Calibration Steps

Monitor Settings

Before starting calibration please set all gain, bias, and rotary knob controls back to default.

From the COLOR menu on the monitor set COLOR SYSTEM to CalMAN and set the LUT MODE to your choice of Normal or Advanced. CalMAN is compatible with both modes. See the monitor user manual for details on Normal vs. Advanced LUT Mode operation.

Next, set the GAMUT selection on the monitor to match the color space you plan on calibrating for (e.g. Rec709, P3, etc.) Then set the LUMINANCE MODE to the desired setting. We suggest 100 for SDR and the HDR selection for HDR.

The last monitor menu selection to consider is the RANGE selection. The RANGE setting on the monitor should be set to match the output range of your test pattern generator source. For example, if using Resolve as your test pattern generator with Resolve set to Video Range the monitor should also be set to Video Range. A mismatch between your test pattern generator output range and your monitor's RANGE setting will lead to an incorrect calibration result.

Clear Panel Noise

If you plan to run the Clear Panel Noise function we suggest doing so before calibration.

Warm-up

A warm-up period of 1 hour is suggested before starting calibration. For proper warm-up please set the monitor to the LUMINANCE MODE selection you plan on using and send the monitor a test signal. For XM OLEDs we advise alternating patterns of full field Red, Green, Blue, and White.

Connecting the monitor to your network

After the monitor has been turned on connect the display's ethernet port to your local network. The display will obtain an IP address via DHCP. If your display fails to obtain an IP address, please unplug the ethernet cable, reboot the monitor, and connect the ethernet cable only after the display has completed its boot cycle. The assigned IP address can be seen from the monitor's SYSTEM menu. Take note of this IP address as you will need it to connect CalMAN to the display.

Connecting Devices in CalMAN

Start DaVinci Resolve and create a new timeline. There must be content in your timeline before starting calibration.

Verify that the monitor is receiving a signal from Resolve then click on the Color Tab in Resolve.

Click on the Workspace menu in Resolve. Select Monitor Calibration. Select CalMAN. A pop-up dialog in Resolve will request an IP address, which can be found once you start CalMAN.

Start CalMAN and Select *Open Workflow Template -> Calibration -> 3D LUT* from the menu at top left.

Once the 3D LUT workflow template opens select the *3D LUT Only* option.

Follow the prompts to connect your meter.

Next select *Find Source* and select DaVinci Resolve as your Pattern Source. Select *Connect* and take note of the IP address listed. Enter this IP address in Resolve and press Connect. Do not close the Calibration network connection window in Resolve as this will terminate your connection.

Return to CalMAN and Select *Find Display -> Flanders Scientific -> FSI XM Monitor*. Type in the IP address of your monitor as found on the monitor's System Menu, then select *Connect*.

Press NEXT to continue with the calibration process.

Calibrating the Monitor
In CalMAN set your Calibration Targets, for example Whitepoint: D65, ColorSpace: Rec709, EOTF: Gamma 2.4. Then select NEXT.

You can skip the Pre Cal Capture step if you like, this is optional. However, before continuing select the FSI monitor tab at top right and select Full DDC Reset. This step will load UNITY LUTs to the selected calibration position. Loading UNITY LUTs returns the monitor to its native, uncalibrated state, which is necessary before continuing with the calibration process. Please ensure you are resetting the LUT ID memory that corresponds to the memory position you are saving LUTs to on the monitor.

> ID1 = BT.709 memory position on the monitor
> ID2 = P3 memory position on the monitor
> ID3 = BT.2020 memory position on the monitor

For example, if you have the monitor's Gamut position currently set to BT.709 memory position you will want to reset and save LUTs to ID1.

Note: Please ensure that the File Format listed matches the LUT mode currently selected on the monitor. FSI Advanced Mode 33 is for LUT Mode: Advanced. FSI Normal Mode 17 is for LUT Mode: Normal. More details on Normal and Advanced LUT modes can be found in the XM OLED user manual.

Once the DDC reset is complete select NEXT to continue to the 1D LUT calibration page.

From the 1D LUT calibration page click on the AutoCal symbol and confirm that you have the LUT ID position set to the correct memory position. CalMAN will then begin the 1D LUT AutoCal process. It is normal for the screen to flash during this process as the LUTs are updated in real time. The probe will only read between flashes so any lines, flashes, etc. that occur during a LUT update will not negatively impact calibration. Once this process is complete select NEXT to continue to the 3D LUT calibration step.

From the 3D LUT calibration page select the AutoCal symbol. Confirm your LUT settings once again to

ensure that the 3D LUT will be saved to the correct memory position. We also suggest using 0.5 pattern delay.

Select a time based or point based calibration option. Once the calibration process is complete the 3D LUT will be automatically saved to the display.

Your calibration is now complete and you can continue along in the CalMAN workflow to verify results.

Additional Considerations
Please keep in mind that OLED monitors can suffer from burn in, especially at high luminance. For this reason windowed patterns should not be used for extended periods of time.

Questions? E-mail: Support@FlandersScientific.com or Call: +1.678.835.4934