Flanders Scientific Inc.

GaiaColor AutoCal & GaiaColor Analyzer
XMP & XMP C Series

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GaiaColor Direct Connect Volumetric AutoCal provides a simple and accurate way to calibrate your FSI monitor. On XMP series monitors this automatic calibration routine is currently compatible with the Colorimetry Research CR100, Klein K10A / K80, Minolta CA210* / CA310* / CA410, and the xRite i1D3DS OEM**.

**Minolta CA210 & CA310 integration is limited to the 10mm measurement spot size versions of these probes (rated to 3,000nits) as the 27mm measurement spot size versions are not rated to handle the maximum luminance output of XMP series monitors.*

***xRite i1D3DS OEM not compatible with XMP551 or XMP651*

Before plugging your probe into your monitor you will want to ensure that the following prerequisites are met:

1. Verify your monitor is running firmware version 3.2.06 or later.

2. Ensure that your colorimeter has the correct matrix stored on it for the monitor model you are calibrating. The name of the colorimeter matrix must match the model you are calibrating: **XMP270, XMP310, XMP550, XMP551, XMP650, or XMP651. NOTE: for simplicity, XMP C series units use the same matrix name as their XMP counterparts since these use the same panels with the same spectral power distribution. This means that the XMP270C, XMP310C, and XMP550C are compatible with matrices named XMP270, XMP310, and XMP550 respectively.**

3. Disconnect all signal cables from the monitor.

Automatic Calibration Steps

Step 1: With the monitor powered on plug the probe into the monitor's USB Type A Port.

Step 2: From the Monitor's Color-Global Menu select GaiaColor AutoCal, then select Start. Confirm you want to Start Display Alignment by selecting Yes.

Step 3: Select your probe type from the list of probes provided on screen and press Enter to confirm. After selecting Enter an automatic 10 minute warmup process will begin.

Step 4: During the warmup process use the on-screen guides to position your probe correctly in the center of the screen. This can be done at any time during the warmup process, simply ensure that your probe is centered on the onscreen crosshair before the warmup countdown timer reaches 0 seconds remaining.

Step 5: Once the warmup is complete the calibration will take between 25 and 95 additional minutes to complete depending probe model in use. Once the alignment data is saved you will be prompted to reboot the monitor to complete the process.

Step 6: Once AutoCal is complete any Gamut, EOTF, Correlated Color Temperature, and Luminance Mode selections you make will be applied instantaneously as you select them.

The principle behind AutoCal is that the native, uncalibrated state of your display is profiled and saved to the monitor's non-volatile memory. Then as any color management selections on the monitor are made calibrated states are calculated from that native profile and instantly applied on demand. Because all selections are calculated from this one primary profile capture you can make any selection without having to rerun AutoCal.

Function
Scope
Video
Audio
Color-Global
Color-Input
System
OSD

ColorSystem	GaiaColor
Gamut Toggle	Hue
3rd Party cLUT	User1
Red Gain	0
Green Gain	0
Blue Gain	0
Red Bias	0
Green Bias	0
Blue Bias	0
GaiaColor Analyzer	
Analyzer Data Show	Off
GaiaColor AutoCal	
AutoCal Data Backup	Start
AutoCal Backup Load	

Approximate AutoCal Time by Probe

CR100
~ 27 minutes

K10A / K80
~ 35 minutes

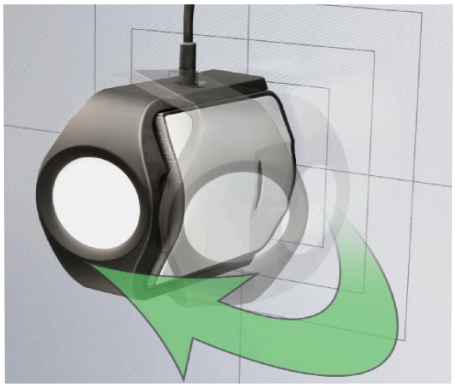
CA210 / CA310 / CA410
~ 25 minutes

i1D3DS OEM
~ 60 minutes

AutoCal Warm-up

Connect Sensor CRI CR-100 and Point To The Cross
Ensure Sensor Channel is Named XMP310
Time Left 9 Minutes 25 Seconds

Key Menu/Enter to Skip Warm-up and Start



Times are approximate and may vary slightly with your specific probe / monitor combination. Times are exclusive of optional 10 minute warmup routine at start of AutoCal process.

If using an i1D3DS OEM please make sure to open the diffuser covering the probe's lens before starting calibration.

The lens should be pointing towards the screen and the white diffuser disk should be pointing away from the screen.

Tips and Troubleshooting

Issue / Topic	Solution / Tip
Monitor displays error message advising you to check probe connection and/or channel name	This error can occur if the probe you are connecting does not match the probe model you selected from the monitor's menu when starting Automatic Calibration. This message can also appear if you do not have a correctly named matrix loaded to the probe. For example, if connecting to an XMP550 a matrix named XMP550 must be stored on the probe. Please ensure a valid and correctly named matrix is stored on the colorimeter and that the probe is properly connected to the display's USB Type A port.
Is disconnecting all signal cables before starting automatic calibration actually required?	**No, but it is critically important that if a signal is left connected that the signal does not drop out, disconnect, or change format for the duration of the AutoCal process.** Change of format or loss of signal during AutoCal may interrupt the process and could potentially render the monitor inoperable so it is a best practice to disconnect signal cables if possible.
The monitor or probe was unplugged before calibration completed	Previous calibration data is not deleted until the new calibration completes successfully so a mid-calibration power interruption to monitor or probe is not generally a problem. Simply unplug the probe from the monitor, power cycle the display, then reconnect the probe and start again.
Can I start my calibration right away or is warm-up necessary?	Best results will be obtained when calibrating a monitor that has had time to warm-up and stabilize to approximately the typical operating temperature it will run at in day to day operation. For most users this is most easily achieved by allowing the monitor to perform its automatic 10 minute warm-up as part of the standard AutoCal process. However, if your display was already manually warmed up before beginning calibration (for example if you were already displaying an L20 100nit window for 10 or more minutes on screen) you can press Enter to skip the automatic warm-up procedure during AutoCal. However, do not attempt to warm-up your display using an extremely bright static test patch for an extended period of time as this will cause additional heat buildup that will not be representative of the typical operating temperature of the display in normal day to day operation.

Tips and Troubleshooting

Issue / Topic	Solution / Tip
Poor results or calibration failure when using CR100	When using the CR100 please ensure that Exposure Multiplier is set to 1, Sync is set to Auto, Max Exposure is set to 500ms, and Max Flicker Frequency Search is set to 150Hz. These settings are typically the factory default on CR100 probes, but they can all be checked and updated as needed from the CRI Utility. Incorrect probe settings can cause problems during AutoCal.
Calibration Validation Considerations	If you'd like to validate your AutoCal results with 3rd party software we suggest using the same or similar equipment and settings used during AutoCal. If validating with a colorimeter, using the same probe with the same or similar matrix will provide the most consistent readings between calibration and validation. We also suggest validating HDR with an L18 (~3% window) in order to validate the monitor's true peak luminance capability. For SDR, using a common test patch size like a 10% window (~L32) should also work well for validation. As with AutoCal itself, validation is best performed after at least a 10 minute warm-up at 100nits after boot up. A 10 second stabilization for both monitor and probe on 100% white is also advisable before beginning validation readings.
K10A measurement spot size consideration	The K10A has a larger measurement spot size than most colorimeters, especially when using the available extension tube. For smaller monitors this can cause the measurement spot size to exceed some of the test patch sizes used during AutoCal, which will negatively impact readings. For this reason when using the K10A with 31.5" and smaller monitors it is advisable to omit the extension tube and use just the provided rubber hood and main probe body as this will reduce your measurement spot size from 60mm to 43mm. A 43mm measurement spot size should fit well within all generated patches provided that your probe is precisely centered on screen.

Tips and Troubleshooting

Question	Answer
Do customizable manual calibration settings need to be reset before starting AutoCal?	No, customized settings do not necessarily need to be reset before starting AutoCal, but importantly any custom settings will continue to impact your post calibration result if not returned to neutral. As explained earlier in this document GaiaColor AutoCal works by profiling the native, uncalibrated state of your panel and saving that to non-volatile memory, with any color menu selections made then being calculated from that native profile data. Since the profiling process is measuring only the native panel response any custom manual settings have no bearing on this profiling process. However, if you have custom non-neutral Gain, Bias, Hue, Chroma, Bright, or Contrast selections applied these will be applied on top of the neutral calibrated state of any given selection. This has a few practical implications. First, and most importantly, if you had some unwanted custom, non-neutral, settings accidentally applied before starting GaiaColor AutoCal you can simply reset these to default/neutral at any time. You should not have to run a new AutoCal simply because you forgot to reset unwanted custom settings to default before starting AutoCal. Second, if you have a custom setting you have spent some time dialing in shortly after a previous GaiaColor AutoCal you should not have to redo those custom settings. A new GaiaColor AutoCal run should return you to essentially the same neutral baseline achieved during any previous GaiaColor AutoCal run so any customized user preference tweaks you have made should still apply quite well. This is particularly useful if for example if you have a custom white point you like to use. You should be able to run AutoCal, apply your custom tweaks to the manual calibration settings, and then simply do new AutoCal runs over time with minimal to no changes to your custom settings needing to be made. For users that want to ensure any manual calibration settings are indeed back to default/neutral this is easy as 0 is the default neutral Gain, Bias, Hue, Chroma, Bright, and Contrast setting. Any non-zero value for these manually adjustable settings is a custom, non-default user selection.

GaiaColor Analyzer is a fast, powerful calibration QC tool built into every XMP and XMP C series monitor. It allows you to use the same probe used for GaiaColor AutoCal to verify the calibration state of any monitor color space configuration in as little as 60 seconds. After analysis reports are shown directly on screen meaning that no standalone software or computer is required.

GaiaColor Analyzer automatically checks calibration against your current monitor configuration, meaning you can run accurate QC reports across thousands of potential configurations without any additional setup steps. GaiaColor Analyzer is the perfect companion to GaiaColor AutoCal allowing you to confirm that your calibration results are on target, track performance over time, and know exactly when it's time to run a new AutoCal.

Running GaiaColor Analyzer is very similar to running GaiaColor AutoCal. You should reference the same prerequisites, best practices, and troubleshooting / tips outlined earlier in this document for GaiaColor AutoCal.

GaiaColor Analyzer Steps
Step 1: With the monitor powered on plug the probe into the monitor's USB Type A Port.

Step 2: From the Monitor's Color-Global Menu select GaiaColor Analyzer, then select Start. Confirm you want to Start Analysis by selecting Yes.

Step 3: Select your probe type from the list of probes provided on screen and press Enter to confirm. After selecting Enter a probe positioning guide will be shown on screen, use this guide to position your probe correctly in the center of the screen. Once properly positioned you can press Enter to begin the analysis process.
**note: for optimal QC results it can be beneficial to allow the monitor to sit with the probe positioning guide on screen for a few minutes before pressing enter, especially if you have just booted your monitor from a cold start or have recently switched from HDR to SDR operation. This provides some warm-up / stabilization time for the display.*

Step 4: Analyzer speed is somewhat probe and monitor configuration dependent, but should typically take just 1 to 2 minutes. Once complete your QC report will automatically be shown on screen.

Step 5: To exit the QC report view go to the Color-Global Menu, Analyzer Data Show, and change the setting from CURRENT to OFF. This will exit the QC report and allow you to continue using the monitor.

GaiaColor Analyzer automatically stores your CURRENT QC report and your LAST QC report to monitor memory. You can quickly recall either report by selecting Analyzer Data Show CURRENT or LAST from the Color-Global Menu.

GaiaColor Analyzer reports can also be exported from the monitor by using the IP Remote Utility (build 1.11.0 or later). Simply connect to the monitor via IPRU and then from the Analyzer Capture section you can select whether you want to pull the CURRENT or LAST Analyzer report. Once pulled into IPRU you can quickly save your report on your computer as a PNG or PDF.