

Technical Article

DLPC84xx Image Quality Calibration Guide



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This document was translated from a simplified Chinese source. (ZHCTA20)

This document describes how to calibrate image quality in DLPC84xx-based systems to achieve higher color accuracy and better image quality.

Important Notes Before Calibration:

- This document provides an overview and brief introduction to the image quality calibration workflow. For detailed instructions on using the Composer tool, refer to <DLPC84xx_ComposerHelpGuide_v2.0>
- Steps 1–3 are **mandatory**. The remaining steps are only required for systems whose image quality needs further improvement and should be adjusted based on actual test results
- Throughout the entire calibration process, keep the system's F# and LED current **fixed**

1. Clear Historical Data

Delete all historical calibration data from the project, including:

- System Luminance
- Course Calibration
- Fine Calibration
- Illumination Driver Settings Set to Zero

After clearing all the above data, compile the project and then flash the blank image to the system to be calibrated

2. Configure the Illumination Driver

Display solid red, green, and blue images in sequence, and record the following parameters:

- Enable Delay
- Rise Margin
- Disable Delay
- Fall Margin

Enter the values into the Composer project, then compile and flash again

3. Perform System Color Point Calibration

To minimize the image firmware size, calibrate only the Sequence Sets and frame rates required by the end customer

After calibration is complete, compile and flash again

After completing these three mandatory steps, test the image quality using TPG Multicolor Ramps or other custom test patterns. If the image quality and colors are satisfactory, the calibration process is complete. If artifacts remain visible, such as grayscale discontinuities or watermark patterns, proceed with the following steps until the issues are sufficiently mitigated.

4. Perform Coarse Calibration

During coarse calibration, output luminance data is collected for each bit plane, and the bit weights are adjusted to improve linearity

After calibration is complete, compile and flash again

5. Perform Fine Calibration

If artifacts remain visible, perform fine calibration. The underlying principle is similar to that of coarse calibration, but fine calibration provides greater precision and can achieve higher linearity at the cost of a longer calibration time

After calibration is complete, compile and flash again

6. Enable Reduce Ramp Nonlinearity

If artifacts are still visible, enable the Reduce Ramp Nonlinearity option for the specific color channels as needed: All, R, G, B, C, M, or Y

After configuring this option, compile and flash again

7. Repeat System Color Point Calibration

For the Sequence Sets in which Reduce Ramp Nonlinearity has been enabled, repeat System Color Point Calibration to ensure that the color output remains unchanged

After calibration is complete, compile and flash again

8. Perform Coarse Calibration

If artifacts are still visible, repeat coarse calibration for the Sequence Sets in which Reduce Ramp Nonlinearity has been enabled

Following this calibration workflow can help DLPC84xx-based display systems achieve improved color accuracy and overall image quality.

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