LiteLOC™ calibration for cinema projectors

The LiteLOC calibration is performed in the factory under specific setup conditions which include the type of lens, screen, and the spectroradiometer used for measuring screen color and brightness.

Your projector's setup conditions may not match the factory setup which may result in a discrepancy in color accuracy. Upon first installation, check the accuracy of the color point and if unsatisfactory, perform this calibration. Doing this calibration captures all the variables of your setup and achieves the best results. By doing this calibration, you will not overwrite the factory calibration. Once satisfied, some scenarios may exist in which you may need to re-do the calibration in the future.

Re-doing this calibration is required if the following is replaced:

- Color sensor board

Re-doing this calibration is optional if any of the following are replaced:

- Light engine
- Lens
- LOS (laser optical subsystem)
- Screen
- Any other optical components in the optical path between the LOS and the screen

After replacing these components, check the accuracy of the color point and if unsatisfactory, re-do this calibration. See *Calibrating LiteLOC* (on page 1),

Affected products

The following products are affected.

- CineLife+ Series projectors

Calibrating LiteLOC™

Follow this procedure to generate the calibrated data.

1. Download the LiteLOC Sensor-to-screen Calibration workbook from the Christie website.
   a) Go to URL: *https://www.christiedigital.com/products/cinema/projection/*
   b) On the product page, select the model and switch to the **Downloads** > **Technical Reference** tab.
2. Ensure the projector is set up in representative ambient light and ambient temperature.
3. Power on the projector.
4. Set the brightness at 70 to 80%.

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The exact color and brightness are not important as this step is to help align the spectroradiometer only.

5. Display the **DC4K ANSI-17-Point** test pattern or a similar test pattern that can be used to locate the center of the image.
6. Set up a spectroradiometer, such as the CR-250, on a tripod.

   Place the meter perpendicular to the screen to achieve accurate measurements. Christie recommends using a CR-250 or better.
7. Connect to Kore Librarian on port 5000.
8. Log in as the service user.
9. Open port 5103 using the command `(CAL + PASS 1)`.
10. Connect to port 5103.
11. Delete all existing calibration (LOS-to-Sensor and Sensor-to-screen).
    a) Send the command `(RGB + INVL 1)`.
    b) Send the command `(RGB + INVL 1 "FACTORY")`.
    c) Send the command `(RGB+INVL 2)`.
    d) Send the command `(RGB+INVL 2 "FACTORY")`.
12. Select **Laser Settings** > **Manual Laser Control** to disable LiteLOC.
13. Select **Display White Test Pattern**.
14. Set the **Maximum Expected Room Temperature** or **Chiller Setpoint** feature.
    - *For non-chiller systems*—Set the **Maximum Expected Room Temperature** feature by choosing the maximum value you expect your room temperature to reach. For example, set the dial to 25°C (77°F) if you expect your maximum room temperature to not exceed 25°C (77°). This value should be greater than or equal to the current ambient temperature.
    - *For chiller-based systems*—Set the **Chiller Setpoint** feature. For details, refer to the *Setting the chiller setpoint* (on page 3) topic.
15. Use the RGB sliders to set the maximum brightness at the required color point.
16. Allow 20 minutes for the laser devices to stabilize at the new values.
17. To ensure the required color point has not drifted, measure the color points with the spectroradiometer.

    It may be necessary to make minor adjustments to RGB drives to get back to the required color point. If necessary, make the adjustments using the RGB sliders. A wait period is not required after making minor adjustments.
18. In row 9 of the LiteLOC Sensor-to-screen Calibration workbook, enter the current settings for red, green, and blue.

    The drive percentages in columns A, B, C of rows 15 to 23 are calculated based on the current settings.
19. Use the RGB sliders to set the laser drive levels from row 15 of the workbook.

    For example, `R = 63.8%, G = 74.5% and B = 50.4%`
20. Perform the measurement using the spectroradiometer and record the returned values for x, y, and fL in columns G, H, and I of row 15 of the workbook.

    For example, `x=0.3334`, `y=.2885`, and `fL=510`.

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21. In columns D, E, and F of row 15 of the workbook, record the color sensor values CSense X, CSense Y, and CSense Z from the Manual Laser Control page for SX, SY, and SZ respectively.

    For example, `SX=3073532`, `SY=2564292`, and `SZ=1265818`

    Alternatively, you can also retrieve the CSense values using the `(RGB+MEAS?)` command in Kore Librarian. The example response is shown below:

    ```
    (RGB+MEAS!"3073532" 007 "2564292" 007 "1265818" 007 09497 07874 00000 10000 "1, 02863,03597,00000,02799, 02863,03597,00000,02799")
    ```

    where SX=3073532, SY=2564292, and SZ=1265818
22. Repeat steps 18 to 20 for rows 16 to 23.
23. From row 28 of the workbook, copy the highlighted command and run it in Kore Librarian.

    For example, copy `(RGB+CAL2 "5137" "610" "345" "0" "534" "4490" "34" "0" "-167" "57" "1640" "0" "-125503" "-133936" "-57954" "1" "637" 1 0)` to Kore Librarian and run the command.

    LiteLOC calibration is complete.
24. Power off and restart the projector.

    The LiteLOC calibration takes effect.
25. Log into the projector with the Service account.
26. From the display panel, select **Laser Settings** > **Laser Power/LiteLOC Setup**.

    Controls to set the required brightness and x,y controls are now available.
27. To close port 5103, connect to port 5000 again and send the command `(cal + pass 0)`.

Setting the chiller setpoint

The chiller setpoint represents the temperature of the coolant supplied to the projector.

This procedure only applies to the CP4440-RGB and CP4450-RGB projectors.

The chiller setpoint default temperature is 24°C (75.2°F). The default setting addresses many typical projection booth conditions, ensuring maximum projector brightness and operating efficiency.

If room temperatures or relative humidity are allowed to rise, the maximum power setting available for the lasers is reduced and brightness is decreased as a result.

The projector is equipped with sensors that monitor ambient temperature and humidity. When selecting the chiller setpoint, use the actual temperature and relative humidity of the projection booth expected during operating conditions. Selecting a setpoint that does not reflect actual show environment conditions may result in a sub-optimal projection image.

1. Use the reference chart below to determine the coolant temperature required for your site.

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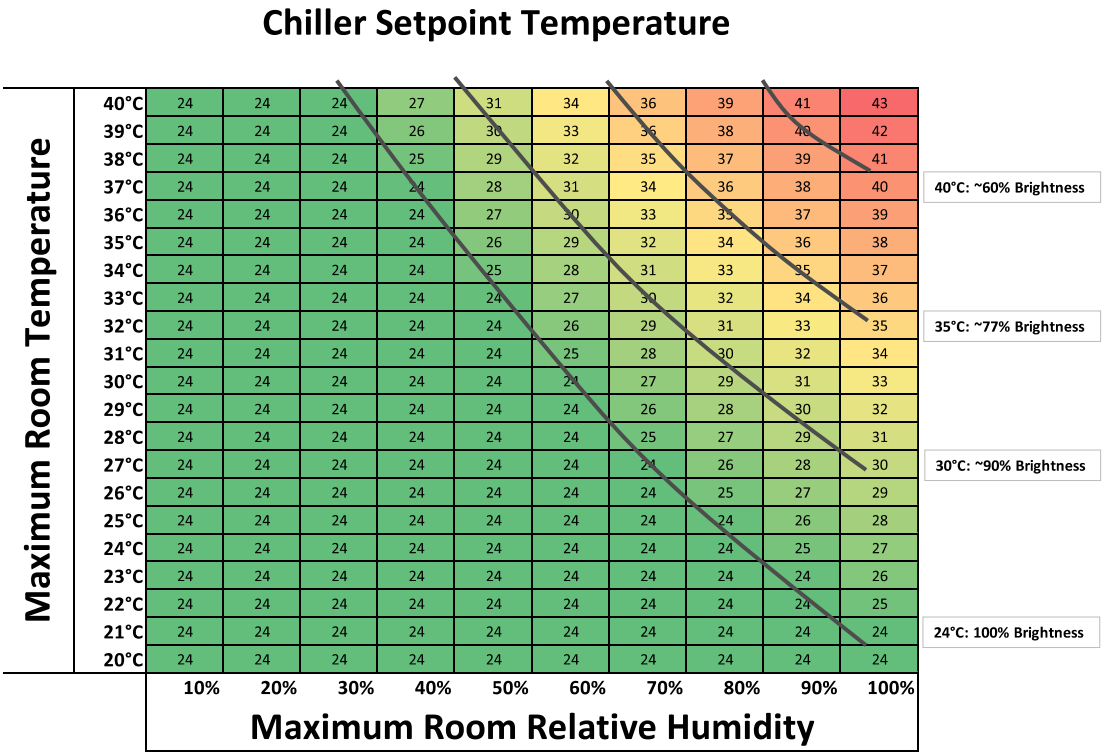

2. On the Y axis of the chart, find the **Maximum Room Temperature** expected in the projection booth.
3. On the X axis of the chart, find the **Maximum Room Relative Humidity**.
4. To identify the correct chiller setpoint temperature, find the intersection of the two rows.

   Choosing a chiller setpoint temperature that falls outside the green area means that projector brightness is reduced.

Technical support

Technical support for Christie Cinema products is available at:

- *Support.cinema@christiedigital.com*
- +1-877-334-4267
- Christie Professional Services: +1-800-550-3061 or *NOC@christiedigital.com*

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