



Opple Light Master III User Guide

The Opple Light Master III (LM-III) product is useful for measuring illuminance (in lux, or lumens/m²), correlated color temperature (in degrees Kelvin), and flicker (in hertz) where light sources can be isolated. It cannot be used to measure initial lamp lumens or lumen output from a source, as that can only be achieved through specialized laboratory equipment.

Prepare to connect the LM-III to a smart device:

The LM-III requires the use of a smartphone, Bluetooth connectivity, and an app to work. Download the app from the Opple website or QR code on the device package, either the IOS or Android version, as applicable.

- The Android version may be found here: https://play.google.com/store/apps/details?id=com.opple.lightmasterpro&hl=en_US&gl=US
- For Apple products: <https://apps.apple.com/us/app/light-master-pro/id1481752643>

Install the app on your smartphone. It is recommended to review the instructions that can be found on the app to ensure you are familiar with its settings and operation.

When using the LM-III, make sure that Bluetooth and GPS/location services are active on your phone. Some devices will not connect to the device if these settings are not turned on.

- If asked, access to the microphone is optional (IOS).

Pair the LM-III with a smartphone:

1. Open the LM-III by sliding open the case to reveal the sensor. An LED will blink, indicating that the LM-III is now in connection mode.
2. In the app, open 'Settings' and the 'Switch Light Master' menus. Push on image indicating the LM device model you are operating.

3. Place the LM-III next to the smartphone (within 3 cm) when pairing. When the LED is on and stops blinking, it should be connected to the smartphone. Continue to follow the instructions on the smart device screen to finish the pairing process.
4. If a connection is not made, close the LM-III and slide it open again to place it back into pairing mode. The LED should once again blink, indicating it is trying to pair. Follow the instructions of your device for Bluetooth connecting and the instructions on the LM-III for pairing.

How and where to hold the LM-III device when taking measurements:

For Measuring Color Correlated Temperature (CCT)

The sensor should be oriented such that no other source contributes to the measurement. The sensor should face the light source in question squarely to maximize exposure to it. The distance from the source is relevant only from the standpoint of isolating the source. If the device can't exclude light that is not from the source in question, it must be moved closer until the source may be isolated and a reading can be made. Let the reading stabilize for about five seconds before ending the measuring process and pressing stop to hold the reading where it can then be noted.

For Measuring Illuminance:

Note - orientation of the LM-III for taking measurements is important for greatest accuracy.

If the meter is being used to check compliance with an ordinance, follow the language of the ordinance pertaining to the position of the measuring device. For instance, an ordinance may state "measured at the property line 4 feet above the ground in a vertical position." With these directions, the meter should be held with the sensor facing the source of light at the indicated height. If the instructions say to place the device horizontally, the sensor should be directed upward, facing the sky.

If no orientation instructions are included, measure both vertical and horizontal at a height that has no materials blocking the light source, such as plants or objects, and note that these measurements were taken without ordinance specificity.

NOTE: When an ordinance states that a measurement should be taken at the property line, this is of the property line for the source.

Opple Light Master Pro App Directions

Illuminance and CCT

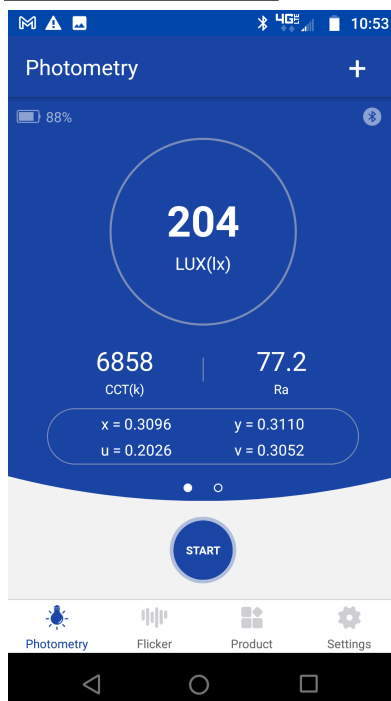


Figure 1: Photometry screen with the illuminance and CCT readouts.

1. To take readings with the LM-III device, open the 'Photometry' menu on the smart device app. Once you are ready, push the 'Start' button.
2. The device takes continuous readings. Wait five seconds to stabilize the readout before pushing 'Stop' to pause the readings.
3. The center of the page will display illuminance as lux(lx) within a circle.
4. Underneath the circle to the left, the app displays CCT(k).
5. For a detailed description of which combinations of light are present, swipe right to view the CIE 1931 Chromaticity Curve. All colors are theoretically indicated on this graph, and specific X and Y coordinates give the exact location of the color on the graph. This feature of the Opple LM-III, at present, is not a part of any lighting specification or requirement for our International Dark Sky Places program. For more information, here is a [beginner's guide to understanding colorimetry](#).

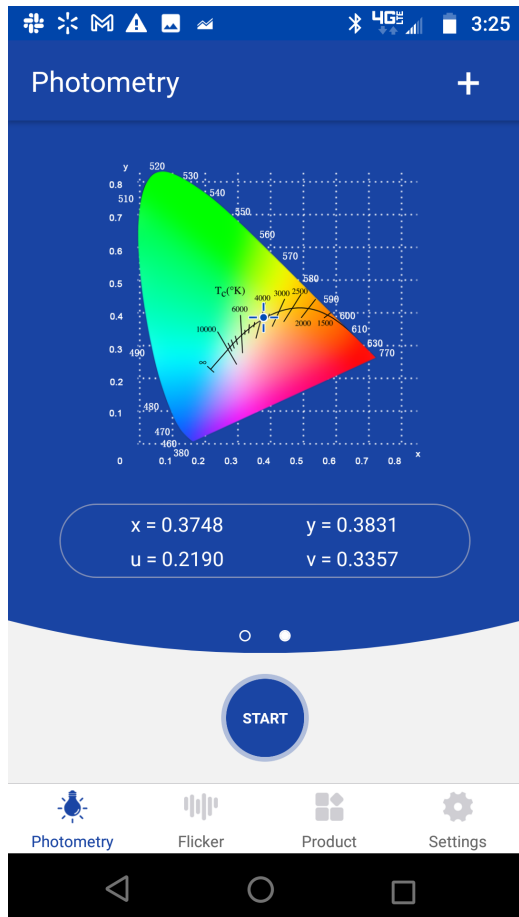


Figure 2. Example of the CIE 1931 Chromaticity Curve.

Flicker

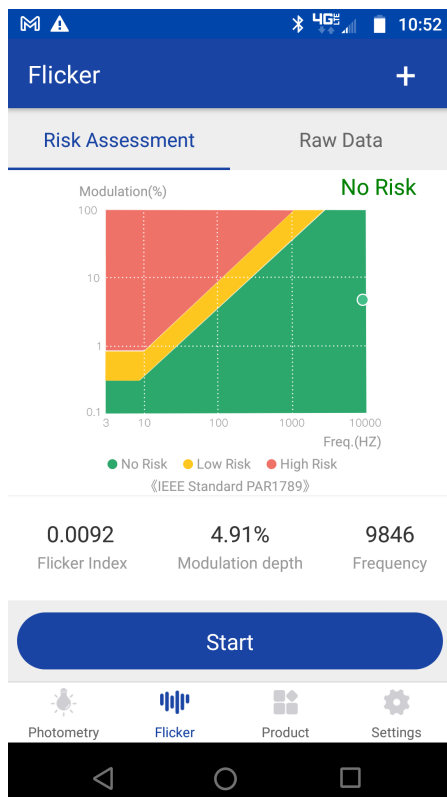


Figure 3. Risk assessment figure of flicker.

The tab pertaining to 'Flicker' provides information that is presently not regulated and not necessary to obtain. The phenomenon, though, is only recently being studied for potential negative effects among some individuals that are sensitive to it. To this day, there is not a value that is indicated as having the potential for causing distress or discomfort flicker. Currently, the LM-III device provides a low, medium, or high 'risk assessment' of flicker based on values defined by IEEE Standard PAR1789.

Tips for making accurate readings:

- Give the meter a chance to stabilize when exposing the LM-III to a new source, several seconds at least. The device should be oriented vertically. Hold still and have the sensor face directly toward the light source.
- The height and direction of the device (horizontal or vertical) can be further determined by definitions provided in your local lighting policy.
- The source being evaluated must be isolated and have no other luminance contribution from any other source, including moonlight, as that can negatively affect the accuracy. A cloudy sky with light reflection can be equally problematic. For the most accurate readings, a clear and cloudless sky will give the best results.

- Measurements taken outdoors should be done after twilight for greatest accuracy, or at least an hour after sunset.
- CCT readings measuring a light's color temperature can have a about 10-20% variance between tests of the same source in repeated tests. This is normal. An average derived from multiple readings will improve accuracy.*
- For detailed specifications of the Opplé Light Master III, please visit their website: <https://www.opple.nl/en/product/lamps/light-master/light-master-g3>

Notes:

* Specifications permit +/- 250 points when measuring the CCT of an LED. For example, a purchased 3,000K CCT LED may have a reading up to 3,250K or as low as 2,750K. This is the ANSI industry standard. With this understanding, these fixtures are still compliant with International Dark Sky Place requirements.

For more information about understanding and interpreting light principles, visit our [lighting definitions page](#) as well as our [Five Lighting Principles](#).

Definitions of measurements taken by the LM-III device:

The LM-III device can measure either lux or footcandles in terms of illuminance, Color Correlated Temperature, and "flicker rate" in terms of Hertz. These values are described by the following definitions:

- **Lux:** 1 lux equals 1 lumen in a square meter. This is the international unit of illuminance.
- **Correlated Color Temperature (CCT):** A number derived by a calculation of a source's spectral power distribution. A lower CCT number is considered to have a 'warmer' appearance and a high CCT number is considered to be 'cooler'.
- **Hertz:** Describes the number of cycles per second. In terms of lighting, the frequency can vary greatly and some individuals may be sensitive to the "flicker rate" of some LED products.