LED ANALYSER Application Note

LED Intensity

There are many different methods to specify the Intensity of a LED.
One method is to measure the total radiated power – this is known as *radiant Intensity*. Another method is to measure the light as perceived by the human eye – this is known as *photometric* Intensity. Yet another method is to measure a surface area illuminated by the light – this is known as *illumination*.

The Feasa LED Analyzer samples the light emitted by the LED and scales it so that it has a minimum value of 0 and a maximum value of 100,000. This is a relative intensity and is perfectly adequate for *testing* or *comparing* LEDs. If the LED is very dim then a low value will be reported and if the LED is very bright then a higher value will be reported.

The Analyser has five user-selectable ranges at different Intensity values.
If a LED is too bright for one range then select the next higher range or if it is too dim then select the next lower range.

The Analyser should be set up by testing *Known Good Samples* and testing them repeatably to get a good average.

Remember, as LED's warm up the radiated Intensity drops slightly.

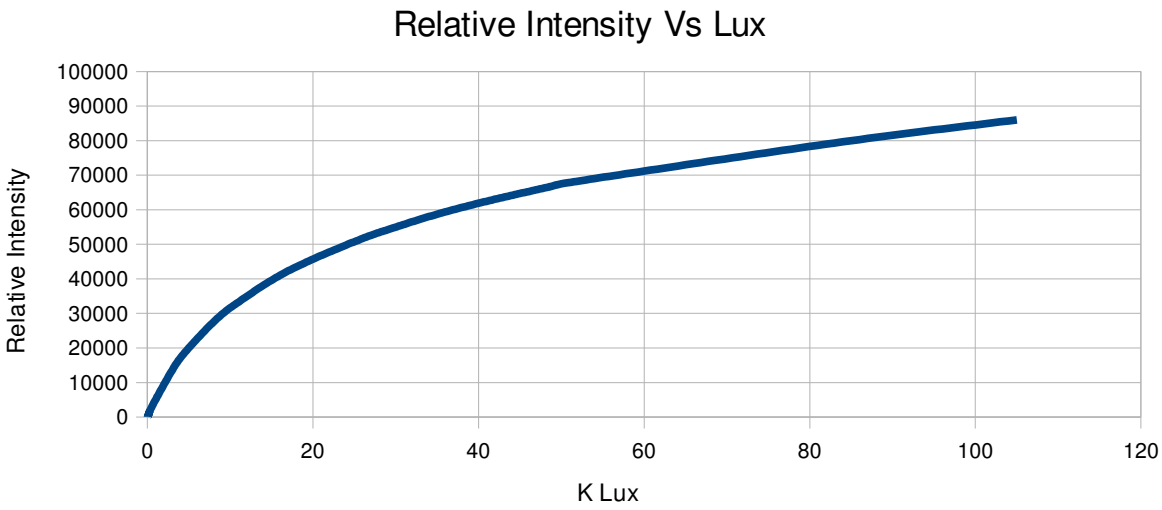

Figure 1. Relative Intensity vs Lux for the LED Analyser

Figure 1 illustrates the response of the Analyser to LED Intensity. The shape of the curve imitates the human eye response to light intensity. At low levels of intensity the Analyser is more sensitive than at high levels of intensity. The same is true with the human eye.

Factors that influence Intensity Measurement

When testing LED's for intensity it is important to locate the Optical center – this is the point from which the light eminates. This is not always the mechanical center of the LED. A check of the Data Sheet will reveal this information.

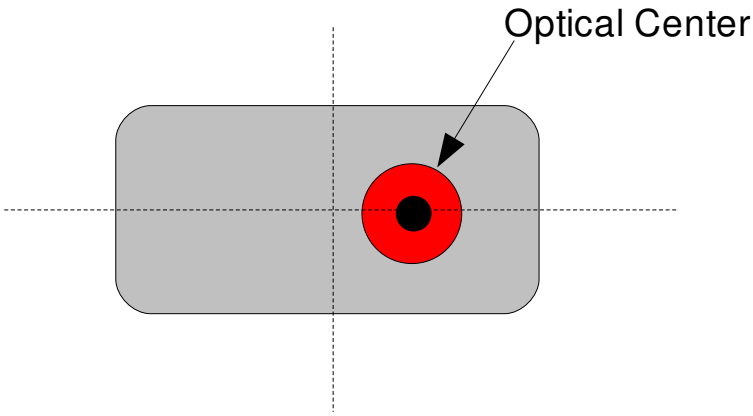

Figure 2. Locating the LED Optical Center

If testing the intensity is an important consideration in your Test Process then the use of Optical Heads is strongly recommended. These will give much more stable results than using bare fiber to collect the light.

All Optical components must be cleaned regularly to avoid degredation of intensity values. Accurate, repeatable positioning of the Optical Heads over the LEDs is important to minimise tolerance errors.

Another important point to remember is that the light intensity from LED's *decreases* as the LED warms up. The amount of decrease depends on the LED but it is not uncommon for intensity to drop by 5% after a few minutes.
Figure 3 shows the Intensity variation for a white smt LED as it warms up.
It can been seen from the graph that the LED has stabalized after 300 Seconds.

The current used to excite the LED has a direct influence on the intensity. Even small changes in current will result in significant Intensity variations.
If the current through the LED is regulated by a series resistor then the tolerance of the resistor and power supply variations will affect the LED Intensity.

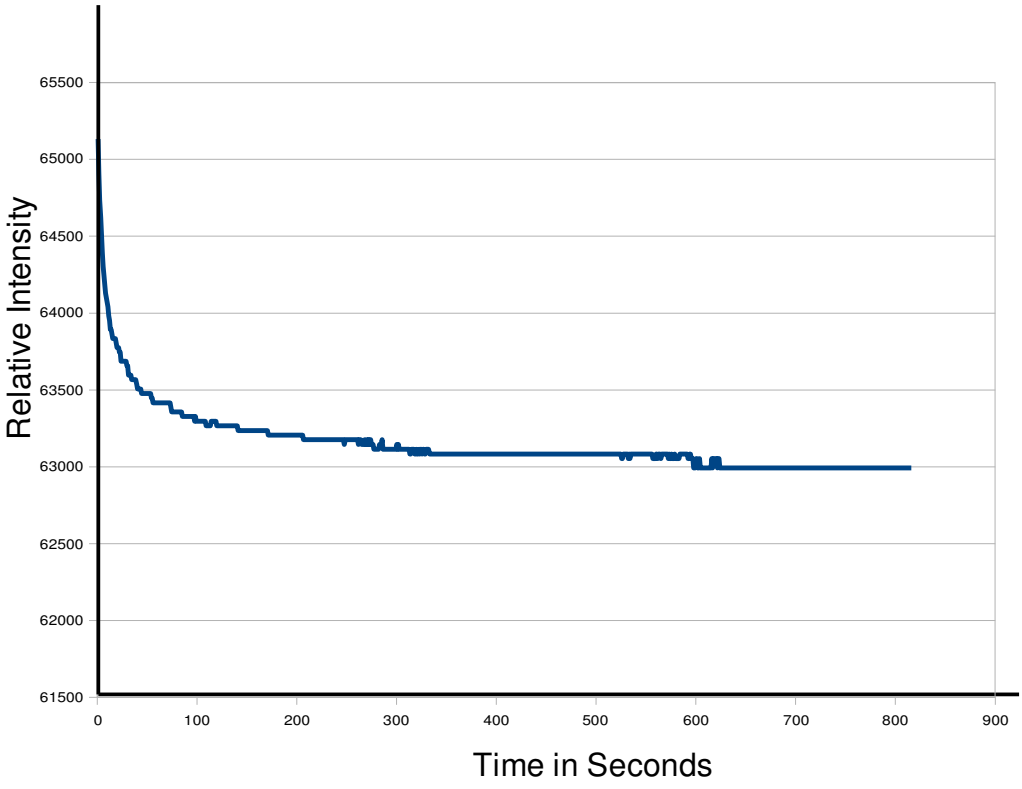

Figure 3. Intensity decrease as the LED warms up