

LED Intensity Measurement (Case Study)

Challenge

In a recent application our customers needed to test LEDs in commercial fixture systems. The fixture light consisted of an array of 120 light points and LEDs. The fixture light operated in a high-intensity mode called "stage mode" and a low-intensity mode called "ball mode".

When the LEDs were in "stage mode" their measurement system would activate.

In order to commission this, several fixture filters were used to reduce the LED intensity to a level acceptable to the test system. However, when operated in "ball mode", the activation of the control during filters caused inconsistency in the measurement of LED output and intensity.

Solution

The customer used the Flux LED Analyser in conjunction with Flux Optical

Studio. The Flux LED Analyser has an extremely wide dynamic range which allows it to test LEDs from the dimmest LED (0.1) up to the brightest LED, without the use of any external optical attenuators or filters (at least 200 lumens). The Flux DMX LED Analyser was connected together in a daisy chain configuration in order to test 120 LEDs simultaneously.

In this particular case the customer opted to use the X1 chrominance and luminance

module from the Flux LED Analyser. Flux provided a comprehensive table of reference cards which were used to adjust the Flux LED Analyser after it was fixed in the test fixture.

The process that each filter was measuring the colour intensity and output. By using the most advanced colour technology it was possible to achieve a repeatability of $\pm 0.001\%$ in CIE X and Y chrominance and a repeatability of $\pm 1\%$ in terms of intensity measurements with a linear relationship between it and ball mode.

One of the biggest challenges when setting up this test fixture was determining the test fixture layout. It was decided that the best method was to test a large quantity of PCBs and using the measurement to calculate the mean and standard deviation of each filter position. Two tests were determined using the mean values as measured by the Flux LED Analyser and the MinMax reference were derived from the relevant LED data sheet.

In order to ensure that the LEDs were thermally stable the LEDs were pre-warmed for a fixed time before any measurement was made.

Result

Using the Flux balancing software it was then possible to adjust the mean intensity value of each filter to compensate for any fixture variations. A golden thread (reference board) was created and the measured value for each filter was stored. This board was then used to verify the test fixture each day to ensure that there was no drift in the test results.

After drying of the test fixture the test time was approximately 1.5 seconds for the high intensity test and 1.0 seconds for the low intensity test of all 120 LEDs. The customer reported a more consistent response from the Flux LED Analyser in terms of both colour and intensity measurement. See Flux Case Study below.

<http://www.flux.com>

Led Intensity Measurement Case Study

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Led Intensity Measurement Case Study:

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