PCB Testing Machine of Led Light

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Abstract: This proposed paper describes the hardware implementation of PCB Testing Machine of LED light, connection of different hardware components and their programming, schematic diagram of components and block diagram of hardware model. Now a day in the production house of PCB of LED or in the LED manufacturing and the 1000 number of LED panels are tested everyday.The testing is done manually by only checking the ON /OFF condition of LEDpanel. This paper proposed the hardware solution for this problem by automatically testing of LED PCB's which is going to check luminous capacity (illumination),as well as life of LED PCB'S (panels).By testing the LED PCB'S automatically the time consuming capacity is reduced and thus improving the efficiency of testing of LED PCB'S. By testing illumination and overall above ratings the detection of faulty PCB and correct (unfaulty) PCB are done.

Keywords: DC motor ,sensing technique, controllering techniques .

I. Introduction

The lights are most demanding lights today, so to provide good quality product and service manufacturer have to test the lights while fabrication process. The working and functions of different components in this testing machine are describe in this proposed paper. The controlling technology and sensing technology of different parameters are used. Mounting of resistors and their connection on zero PCB'S are also describe in this paper.

Hardware Implementation: The hardware components which are required for this testing machine are listed are as follows.

1) Aurduino Uno (ATmega 328 microcontroller)
2) Liquid Crystal Display(LCD)
3) Current Sensor (ACS712)
4) Voltage Sensor
5) Light Dependent Resistor(LDR)
6) CD Drive Tray
7) Resistors

1. **Aurduino Uno ATmega 328 microcontroller:** Aurduino Uno is an open source electronics platform or board which can be easily programmed, erased reprogrammed at any instant of time. In this PCB testing of LED lights this component is act as an a controlling and receiving device which receives various input signals. The various programmes of voltage sensor, current sensor, LDR and LCD etc are murged (upload) in Aurduino Uno.
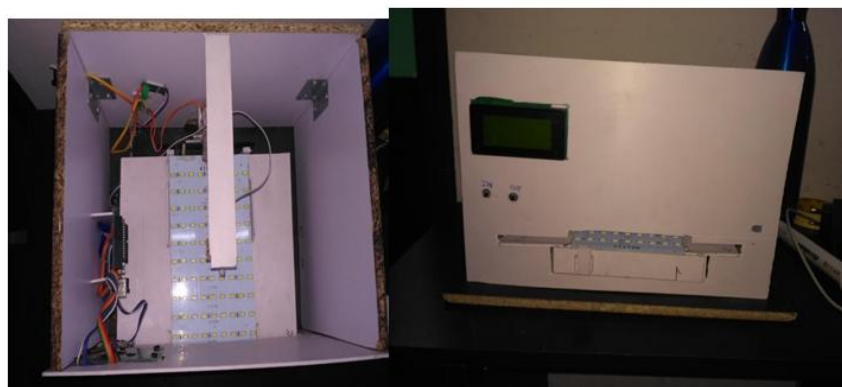

2. **Liquid Crystal Display (LCD 20*4):** The voltage, current and illumination reading of LED light PCB will be displayed on 20*4 character serial LCD panel. The connection of the different points of 20*4 LCD display panel are drawn to the corresponding pins of Aurduino Uno ATmega 328 microcontroller through the connecting wires for displaying the readings of LED light PCB.

3. **Current sensor:** A current sensor is a device that detects electric current in a wire and generates a signal proportional to that current. In this testing machine we use ACS712 current sensor. The connection of current sensor are drawn to the 3 pins of Aurduino Uno i.e. VCC-5v, A1(output) and GND terminal todisplay the readings of current of LED PCB. The program of current sensor is uploaded into Aurduino Uno.

4. **Voltage Sensor:** Voltage sensor is a device that converts voltage measured between two points of an electrical circuit into a physical signal proportional to the voltage. The A0 and GND terminal of aurduino Uno are connected to the voltage sensor terminal. The program of voltage sensor is uploaded into Aurduino Uno. The reading of voltage of LED light PCB is displayed on LCD panel.

5. **Light Dependent Resistor (LDR):** Light Dependent Resistor (LDR) is a photo resistor or photo cell is a light controlled variable resistor which is a one type of resistor whose resistance varies depending on the amount of light falling on it's surface. The LDR is a programmed and the connection of LDR are drawn to the GND terminal of Aurduino Uno through the 10k resistance and to the 5v terminal. By varying the amount of light falling on the LDR surface the light intensity can be detected.

6. **CD Drive Tray:** It is a one type of the drive which is used for the in and out movement of tray in the testing machine. The LED PCB is mounted on the tray and the movement of tray is done by DC motor.

7. **Resistors:** The 2 10k resistors and 1 100k resistor are used in this testing machine. The one 10k resistor is connected to the GND terminal of aurduino Uno and the parallel combination of 100k and 10k are done on zero PCB by using soldering and connected to the GND terminal of battery and positive terminal of battery.

II. Methodology

The circuit diagram of proposed model consist of Arduino Uno ATmega 328 microcontroller, Liquid Crystal Display, Current Sensor, Voltage Sensor, Light dependent Resistor (LDR), CD Drive Tray and resistors. The Aurduino Uno is acts as an a controlling device which receives and controls various signals. The voltage sensor and current sensor are used for sensing voltage and current and display the reading on LCD panel. The LDR is used to senseillumination(light intensity). The programs of the tray goes inside and connects the LED panel to the supply system and operation starts. The LDR sense the illumination and current sensor and voltage sensor sense the current and voltage and display the readings on LCD panel and according to the readings the detection of faulty and correct (unfaulty) PCB are done. The 4 ratings i.e. power rating, current rating, voltage rating and light intensity are detected in one testing.

The aim of this testing machine is to test LED panels automatically by using sensing and controlling voltage sensor, current sensor and LDR are murge into one program and uploaded. The Aurduino Uno is run on 5v D.C. supply which is obtain by using 240v A.C. to 5v D.C. converting adaptor. The different ratings of LED panels like 5v, 8v, 10v and 12v are tested in thus model by using the corresponding ratings of adaptor. The movement of CD drive tray for in and out operation is done by using D.C. motor. The LED panel is placed on CD drive tray and whenever 'in' button is pushed technology. Theadvantage of this proposed model is to test more number of LED panels within less time. The testing machine is helpful to municipal department for checking of highway street LED PCB.

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