Intelligent LED lighting controlled by smartphone

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Overview

Introduction
Light-emitting Diode (LED) is widely used in the 21st century especially for lighting. It is extremely efficient as giving out light energy with low energy waste compared to traditional light bulbs. Also, the switch button will be eliminated. The Bluetooth controller to smartphone will replace the on-off button of the LED fixture.

Aims and objectives
We are going to design a LED lighting product fixed by plastic board. This fixture is expected to control the color pattern by app in the smartphone. Therefore, we have the following aims and objectives:

- To improve the lighting efficiency of the fixture by using LED
- To provide a lower power consumer fixture
- To provide a convenient on-off system by using Bluetooth in smartphone

Methodology

This system is a combination of RGB LEDs, a LED circuit with a suitable LED driver and Bluetooth module. Users can install the smartphone app onto their smartphone and control the light on or off through the application. Users can also change the light color and pattern by their smartphone. This product works with a higher lighting efficiency, lower power consumption and more user-friendly when comparing with the current conventional light bulbs and lighting system.

LED circuit with LED Driver LMX3491Y

System block diagram:

Smartphone Application Logic:

Implementation

The system mainly includes the LEDs, LED driver and Bluetooth board and the smartphone. Some of the implementation and test are shown as:

Testing the LEDs

Testing the circuit board

Testing the connection

And finally we test on the connection and control with smartphone and work on the light box.

Results

The final product is a portable, hand-held, convenient system of LED lighting with a controller which is a smartphone. When users install the application we developed, they can control the LED light with Bluetooth easily. It provides a great convenience because of the wireless control of the fixture from smartphone.

The final product

The user interface of the application