AN ANALYSIS ON LAMP ILLUMINATION CONTROL BY MOBILE PHONE

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Abstract

These lead to wastage of electricity and at the same time a manual control is not effective in the modern era. In this paper, we propose an advanced light control system which is capable of replacing the old generation light control system. The working of light illumination control system is based on the amount of luminous energy in the environment at that moment of time and is control wirelessly by using mobile phone. This system works on Arduino board which has AVR ATmega328 microcontroller.

Keyword-DTMF Decoder, Microcontroller, Embedded system, mobile Phone

Introduction

As more and more consumer electronic and home appliances are used, the size of them is becoming large; power consumption in home area tends to grow. Moreover, unusable power consumption occurs in the absence of human being in public and private sectors. Using the automation in switching the home or office lighting system, the consumption of electricity can be comprehensively reduce which will in turn save the money of the owner. Now the people are looking forward for automation in their daily life. The people are trying to reduce human efforts. This Project is use to control ON OFF as well as Illumination of the light using wireless technology called Bluetooth and Mobile phone. This system will be a powerful and flexible tool that will offer this service at any time, and from anywhere with the constraints of the technologies being applied. Many times a situation occurs when we have to control various devices from a long/remote location according to our choice .Consider following examples,

1) If, we are working in some industry and have to reach at workplace at the earliest to turn on some electrical device like boiler or conveyor belt.
2) In our normal day to day life we go out of home and forgot to turn off fan/light
3) In summer season we want to turn on Fan or AC — Air cooler before we reach home.

For all above situations, we need a device / controller which can turn on / off the devices. To implement this system the consumer should send a unique code accompanied by the required function to his home control system through GSM.

Literature Review

Controlling lighting system by means of LDR and Arduino together is relatively a new concept. After going through many research papers which were related to field of lighting system, I found that there are papers only about street light system and that too most of them are Passive Infrared receiver based and few are LDR based but they are controlled by means of timers and analog circuits. Some were controlled by wireless GSM/GUI networks .That being said they are no papers which coin all the lighting system under one umbrella and use LDR and Arduino system as their fundamental architecture to control it. Automatic Room Light Controller using Arduino and PIR Sensor

Automatic room light controller using Arduino and PIR sensor can be used to turn ON and OFF the illumination system of home / office routinely by sensing the existence of human. Such Automatic Room Lights systems can be implemented in your human. Such Automatic Room Lights systems can be implemented in your Classrooms, faculty cabins, garages, staircases, bathrooms, etc. where we do not need constant light but only when individuals are existing. Also, with the assistance of this system, we can save the energy bill as power will be consumed only when human is present i.e. when required lights will be spontaneously turned ON or OFF.

This paper proposed system of Automatic room light controller using Arduino and PIR sensor and relay module. PIR sensor will spot the human activity and based on response of PIR sensor unit will control the switching action. Automatic Streetlights that Glow on Detecting Night and Object using Arduino

The proposed work is accomplished by using Arduino microcontroller and sensors that will control the electricity based on night and object's detection. Meanwhile, a counter is set that will count the number of objects passed through the road. The beauty of the proposed work is that the wastage of unused electricity can be reduced, lifetime of the streetlights gets enhance because the lights do not stay ON during the whole night, and also helps to increase safety measurements. We are confident that the proposed idea will be beneficial in the future applications of microcontrollers and sensors etc.

The main objective of the paper is to save electrical energy automatically used in powering lights by the application of power-saving elements. This power saved can be used in other applications, such as in irrigation, lighting villages, towns, and many other industries. We have used Arduino in this intelligent system, designed to control the lighting. The designing of a new system must not lead to consumption of massive amount of electricity or illuminate a large area with highest intensity of light unnecessarily. Providing lighting is one of the most important and expensive expenditures on electricity for a city. Lighting can account for 30-50% of the total energy expenditure in typical cities worldwide. Inefficient lighting wastes a significant amount of capital every year, and poor lighting also leads to accidents. The use of energy-efficient systems can reduce the cost of lighting drastically and also provide excellent efficiency. So, in this paper, we propose an intelligent light control system with the help of PIR, LDR, and Arduino. This system can be implemented in workplaces, museums, libraries, etc. As stated earlier, to provide an efficient & energy-saving lighting system by evaluating the external lighting condition and then adjusting the lights accordingly, sensors are used.

Automatic Switch is a device that detects the presence of a human in a predefined area and can turn on the lights or any electrical appliances that we want. The device will automatically turn off the lights or electrical appliance if nobody is presence in the area. PIR sensor is used to detect the presence of a human. Brain of the system is Arduino PRO mini which will drive the PIR sensor and electrical appliances.

Methodology

Here Arduino is main controller and it get power supply from the AC to DC converter. The 230V AC is connected to Load Lamp via Triac. Arduino gets signal from bluetooth to control the lamp illumination via android app that having buttons of illumination.

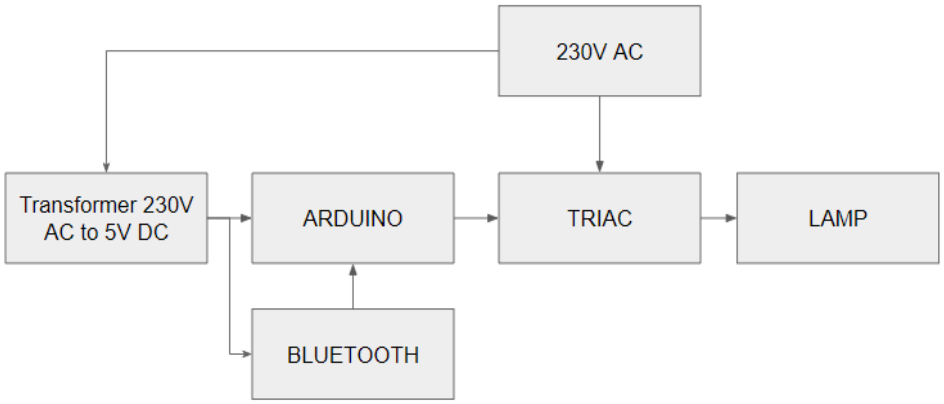

Fig. 1 Block diagram

Working

The android app is connected to the system via bluetooth. The app having buttons on scale of 0 to 10. Each button will send the respective signal to the arduino via Bluetooth. The arduino detect the signal and send the triggering pulses to the triac. This triac is connected to the lamp. As per the triggering pulses to the triac the lamp illumination controls

Hardware Requirement

a. Arduino nano : Atmega328 controller based, working on 5V DC, 13 Digital IO and 6 Analog In pins. Programmed by Arduino compiler IDE software.

b. Bluetooth HC05 : wireless 2.4GHz device compatible with Arduino and mobile application. Works on 5V DC.
c. Triac BTA06 : Gate Turn-On Voltage (Vgt): 1.5V, Peak Off-State Voltage(Vdrm): 600V
d. On-State Current (It): 6.0A, Gate Current (Igt): 10mA
e. Lamp : 60 W inductive Lamp
f. AC to DC converter: 230V AC to 5V DC Converter module
g. Other acesories : Resistors, Wire, PCB, PCB powder and soldering wire

Conclusion and Future Scope

As a conclusion, this study shows how the smartphones can be used in lighting measurement tasks when high precision of data is not required, being a great tool to have a reference of the luminance levels, but they are not as accurate as professional hardware designed for the task. The results do show how the accuracy of each of the three methods used to perform the evaluation of the luminance is high after calibration. However, if the results are compared between the three methods, it can be seen how the precision of the internal sensors, as ambient light sensor or the digital camera, regarding to an external sensor is lower

Future Scope

1. It can be used as controlling speed of fan.
2. It can be used to control room temperature.
3. It can be also used for security purposes burglary, gas detection, smoke detection.

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