

# Design of an intelligent and efficient light control system



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Recently, many researches has been carried out to save the energy in many aspects such as producing a device which consumes very less energy or designing a system which helps to reduce the power consumption using the existing devices.

In this paper, a room light control system is proposed which is named as light control system (LLC). This proposed system will able to provide the needed light which provides the satisfaction of users and will provide energy saving and management. In this paper the Lighting Control System and the decision making algorithm, are discussed. As per the algorithm the system will first check any occupant is there in the room. If so then the system will check the intensity of light in the room and if it is low then it will switch on the light.

Our proposed system can able to minimize the energy consumed for lighting in a room and can able to provide it efficiently. Keywords: Lighting Control system, Energy saving, LDR, PIR sensor 1. INTRODUCTION: Power saving have become a necessary thing in our day to day life. Many conventional power saving methods such as using electrical devices which consumes very less energy or cutting off the entire power supply for a scheduled time for a particular area are not efficient and there will be a lot discomforts to the users and cost may also Increase to use a low power electrical device.

Buildings are responsible for up to 40% of energy usage. Most part of this energy is used mainly for maintaining good lighting such that the workers feel comfortable. Nowadays the newly constructed modernism or automated buildings may have lighting system to improve the comfort of occupants and

to wry. Cats. Com save the energy. But there are large number of old buildings which contains the traditional lighting system.

To reduce the energy consumption In those types of buildings and to help the owners of that building in terms of saving electricity bill an intelligent and an effective method is discussed in this paper. Because of advancement In Sensor technology a very cheap and portable methods to measure our surroundings are available. The amounts of light required to for a good environment to work comfortably in various areas are shown In table 1 which Is recommended by CUBES lighting guides. Issue 2, 117 - 120, 2013 Table 1 Required intensity of light for various environments Type of place and work Filing - Office work General office (Typing and Writing) Painting Classrooms Classrooms for evening class Auditorium Assembly ( Industry) Intensity required 300 lug choux 750 lug 300 lug 500 lug 500 lug 1000 lug occur cause of carelessness of user and a large amount of power is wasted. The lighting system with occupant detection uses passive infrared sensor (PRI). This PRI sensor detects any movement is present in that particular area. If any movement is there means then this system automatically switches ON the lights.

If timers are not used in this type of system means then the lights will be kept in ON state even after the user left the place. Because of this fault also a large amount of energy can be wasted. Then another drawback about this type of system is, it will switch ON the lights when here is an occupant is present in that area. But there is a possibility of enough lighting will be there at that particular time. This system is not going to check the intensity of light

before switching on the lights. Because of this also a large amount of energy can be lost. 2.

**EXISTING SYSTEM:** This section describes about the most commonly used lighting control system used in buildings. Since this method is going to use wireless sensor network it is mandatory to know the operation of existing lighting control system. It can be decided that energy loss is occurred with a lighting system when the lighting system illuminates a eight which is an area which is not being used currently at that particular time or when it illuminates a light even though sufficient lighting is available to work. The most commonly used lighting systems are explained below. . **PROPOSED**

**SYSTEM:** The proposed system overcomes all the drawbacks of existing system. This system takes two things into account before taking any action, namely (1) human presence and (2) intensity of light. The system consists of a PRI sensor (Parallax 555- 28027) and an LDR (NOR 12). The PRI sensor is used to detect whether any occupants are there n that room and LDR is used to detect the intensity of light in that room. Apart from this an algorithm can be implemented in our system which uses both the LDR and PRI sensor to decide whether to switch on the light or not.

**LIGHT PRI SENSE R 2. 1 A Switch manually:** operated In this method a user has to switch ON and OFF the required lights. Since the user can switch on and off the lights as per their preferences there is a chance of keeping the lights in on state even though it was not need during that time. This may This is there in that room then it checks the intensity of light, if it is enough then it won't witch on the light otherwise it switch on the light. 2. 2 By

**Detecting Occupants: LAG HTH CONTROL OLL Figure 1 Setup of proposed**  
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system wry. Cats. Com 118 Issue 2, 117- 120, 2013 4. SYSTEM DESIGN: 4. Block diagram: PRI sensor (Parallax 55528027) LDR (NOR 12) PICK 1687 AAA Relay Lights Figure 2 Block Diagram for the proposed system. This system can be implemented using a PICK 16F877A, a LDR, A PRI sensor and the lights can be controlled by relays. The LDR sensor will keep on sensing the intensity of light and sends it to the microelectronic. The PRI sensor will send a signal to the microelectronic if there is any occupant in the room. If anybody is present in the room then the microelectronic compares the sensed value of intensity in the room with the value already stored in the microelectronic.

If the sensed value is less than the value stored in the microelectronic then the light will be switched on by connecting the relay. Luminance which is sensed through LDR and then the sensed value will be compared with the value stored in the microelectronic, if the value is less than the lights will be switched on or if the sensed value is greater than the stored value then it will wait for some time and again it will from the first. While checking for occupants if no one is there in the room then the system will wait for some time (delay), which can be programmed in the microelectronic then it will start from the first step. . FLOWCHART: Start 5. ALGORITHM: Step 1: Start Step 2: Check whether any occupant is there in the room using PRI sensor. Step 3: If any Occupants is there means then compare the intensity of light in the room which was sensed by LDR. If nobody was there means then after some time then switch on the light or if it was enough means then after some time delay proceed to step 1. As per the algorithm our system will first

check whether any occupants are there in the room with the help of PIR sensor where the system has been installed.

If any occupants are there then it will check the value of light. Check any person is there in the YES NO YES. Check the intensity of light is enough or not. Deal y wry. Cats. Com Switch on the light 119 7. RESULTS: The proposed system has been implemented in a room with four lights each of 40 watts. Since it is normal classroom where evening classes are also conducted the intensity required has been set to 500 lux which was set as the reference level in microelectronic. Before implementing this system, around 800 watts of energy was ensured per day.

After implementing this system in that room it has been considerably reduced to 480 Watts. Thus on using this system a large amount of energy can be saved.