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AUTOMATION OF THE ILLUMINATION SYSTEM

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Abstract: Due to the depletion in the availability of coal & increase in the cost per unit of energy consumption it has led to & need for the efficient use of the electrical energy. Significant amount of energy is used in illumination form& so automation of illumination system is an effective means to reduce the consumption of the energy. Illumination will be controlled on the basis of the demand. The project is based on the campus card system. System controls the power on & off by detecting the smart card.

Keywords: - *Illumination System, Automation, Microcontroller, Class Room.*

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I INTRODUCTION

Efficient use of illumination system has become an import aspect in the modern era. The other methods of energy saving such as disconnecting the load for scheduled period of time is not a feasible option as it leads to the inconvenience environment condition to the consumers & also affects the productivity. Energy losses will take place when the illumination system is still on even though it is not required or whenever sufficient day lightning system is available.

One of the most commonly used method of illumination is switch operated manually control. User has to switch on & off the required lights. By switching on & off the lights manually as per the requirement there is a high possibility that illumination system is turned on even though it is not required. The illumination system uses Passive Infrared Sensor (PIR).This sensor detects the motion of the individual & reacts according to it. If there is any motion then sensor detects it & automatically switches on the light. If timer circuit is not used then illumination system will be turned on even though it is not required & leads to the energy losses. Illumination system will keep on even though illumination can be achieved through the day lightning. Such drawbacks are over-come in the automation system [1].

II LITERATURE REVIEW

(A) System Requirement: - In order to complete the design process some measurements & performance must be done.

(i) Determination of the illumination level: -According to SNI illumination level required for class room is 250 lux.

(ii) Measurement & calculation of room parameters: -Room parameters are colour of the wall, area of the room, reflection factor.

(iii) Lamp position, arrangement & measurement of illumination uniformity

(iv)Calculation of the number of lamps: -To fulfil the illumination level for 250 lux it is calculated as per the formula

$$\frac{\emptyset * CF * LLF}{A} (1)$$

E – Illuminance (lux)

$\emptyset$ – Luminance (lumen)

CU – Coefficient of utility

A – Area of illumination (m^2)

Table 1. Required Intensity of Light [2]

TYPE OF PLACE & WORK	INTENSITY REQUIRED
Office Work	300 lux
Class Rooms	300 lux
Class Rooms With Evening Class	500 lux

(B) Requirement of Automation:-
(i) To carry the functions that is beyond human abilities.
(ii) Supplanting the people in extreme condition works such as fire, volcanoes and nuclear offices.
(iii) Economic Growth.

III PROPOSED SYSTEM

The system consists of information centre, base station & sub control nodes.
(i) Information Centre: -It responsible for the management of the information of the students & staff in the card. It also updates the information & sends it to the base station through the network
(ii) Base Station: - They are responsible for update of the information from information centre & send it to the sub control nodes.
(iii) Control Node: -It opens or closes the master switch of the lights in a classroom according to the detection of the card.

IV CONCLUSION

Understanding the need of energy efficiency Automation of the illumination system is an effective means to reduce the losses. A brief literature review was elaborated on the design of the illumination system. Illumination level for different environment conditions was elaborated & calculations are done.

REFERENCES

[1] Ansiya Jabeen, D. Mahesh Kumar, "Automatic Classroom Lighting Controller and Energy Saving based on Microcontroller Unit", *International Advanced Research Journal in Science, Engineering and Technology*, pp.no.201-203, Volume 3, Issue 7, July 2016.
[2] Mrityunjaya Patted, Swarada Muley, Debamitra Panda, "Intelligent Class Room Automation System Using PIC Microcontroller", *International Journal of Research in Engineering & Technology*, pp.no.154-160, Volume 5, Issue 6, June 2016
[3] Aryanto Hartoyo, Seno Darmawan Panjaitan, "Development of Automation System for Room Lighting Based on Fuzzy logic Controller", pp.no. 955-959, Volume 2,Issue 6, November 2012