

# PERFORMANCE IMPROVEMENT AND ENERGY SAVING BASED ON CLASSROOM BASED ON CAMPUS CARD IN EMBEDDED SYSTEMS

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## ABSTRACT

In class rooms or in offices we can see lot of energy is wasted because the people are switching on the Fans and lights and leaving them switch on. In our project we are implementing novel system to save the power loss. We are allotting a campus card to every student and whenever they entered into class we are going to read their number and count is going to increase and at the same time whenever they are leaving the class room the final count is going to reduce. In addition to the count we are inserting sensors in the class room to detect where the person is sitting. When the count is valid then we are switching on light and fan at particular position where the person is sitting and we are going to save power by switching off the remaining electrical appliances. To detect the person we are going to place the IR based trans-receivers. They are going to detect the where person is sitting. Since we already know how many people are there in the room and we also know where they seated and it is very easy that where we have switch on the fan and light's. If all the persons leave the class room then we can switch off all the electrical appliances in the class room. With the help of this system large amount of energy can be saved.

**Keywords:** ARM7 board, IR sensors, rfid, dc motor, LCD, relays

## I. INTRODUCTION

Wastage of strength is one of the principal problems which we're going through now a days. In our domestic, college, colleges or industry we see that fan / lights are saved on even though there are no person in the room or vicinity / passage. This happens due to negligence or due to the fact we forgot to show lighting off or while we're in hurry. To keep away from all such conditions we have designed this challenge referred to as "Energy saving gadget for sophistication room primarily based on campus card". This undertaking has modules, first one is referred to as ir sensors and 2nd module is known RFID as "Energy saving gadget for sophistication room primarily based on campus card". Main idea in the back of this mission is referred to as "power saving" which measures the variety of men and women coming into in any room like seminar hall, convention room, lecture room. This feature is applied the usage of a pair of Infrared sensors. LCD show located out of doors the room presentations this fee of person be counted. This

person be counted can be incremented if any individual enters within the room and at that point lighting are turned on. And in opposite way, person depend may be decremented if someone leaves the room. When variety of people in the room is zero, lighting inside the room are grew to become off using a relay interface. In this way Relay does the operation of “Automatic room mild controller”. Since this project makes use of 2 infrared sensors, it can be used as Bidirectional person counter as properly.

## **II. EXISTING SYSTEM**

The huge amount of electrical strength of many nations is ate up in lights the buildings, shopping department shops. However, there may be no need in midnight. The gadget purposed throughout this paper, features automatically and switches the mild off for purchasing shops and homes whilst having nobody in it and activates the light when someone going to enter the home and colleges. Practically, this device saves vast amount of the energy. In addition to this, it additionally increases reliability of the mild bulbs and discount in the strength expenses. This device robotically controls and monitors the light of the colleges. In this mission, the prototype comprised on the whole of infrared sensors, LDR sensor and automatic circuit switching

## **III. PROPOSED SYSTEM**

We are allotting a campus card to every student and whenever they entered into class we are going to read their number and count is going to increase and at the same time whenever they are leaving the class room the final count is going to reduce. In addition to the count we are inserting sensors in the class room to detect where the person is sitting. When the count is valid then we are switching on light and fan at particular position where the person is sitting and we are going the save power by switching off the remaining electrical appliances. To detect the person we are going the place the IR based trans-receivers. They are going to detect the where person is sitting. Since we already know how many people are there in the room and we also know where they seated and it is very easy that where we have switch on the fan and light's. If all the persons leave the class room then we can switch off all the electrical appliances in the class room. With the help of this system large amount of energy can be saved.

**BLOCK DIAGRAM**

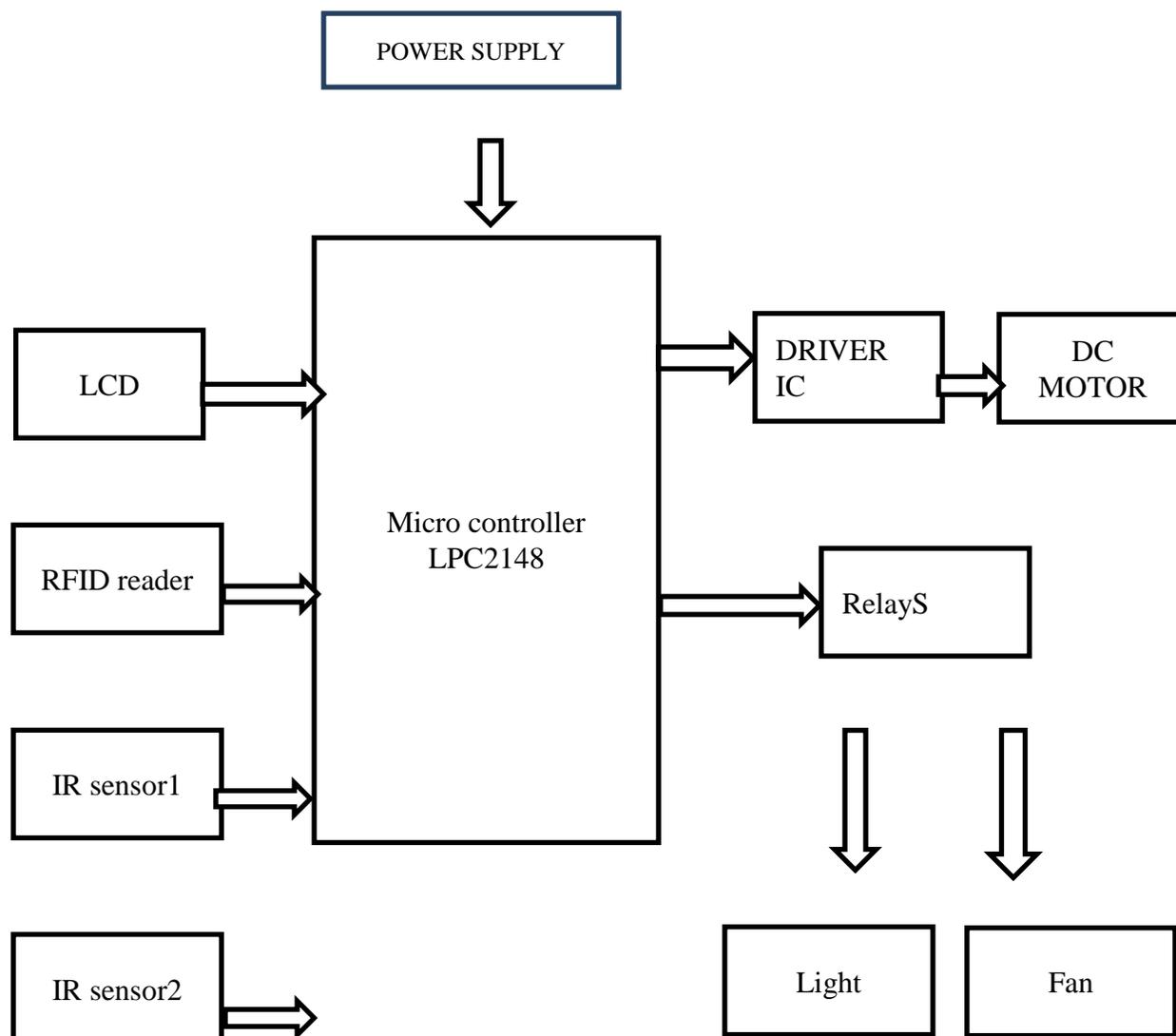


Fig1: block diagram

**LPC2148 microcontroller**

The ARM7 (superior RISC system) presses board primarily based complete on a 16/32-bit ARM7 its approach of 16/32-bit ARM7 TDMI-S microcontroller, eight computer memory unit to 40 pc reminiscence unit of on-chip static RAM and 32 computer memory unit to 512computer reminiscence unit on-chip flash reminiscence; 128-bit In-system Programming (ISP). 32-bit timers/out of doors occasion counters, PWM pulse width modulation unit (six

outputs) and watchdog, Low electricity of actual-Time Clock (RTC), more than one serial interfaces which has 2 UARTs , speedy I2C-bus (400kbit/. There are sixty four pins of ARM7 processor and a couple of ports (port0, port1) 45 pins are enter/output.

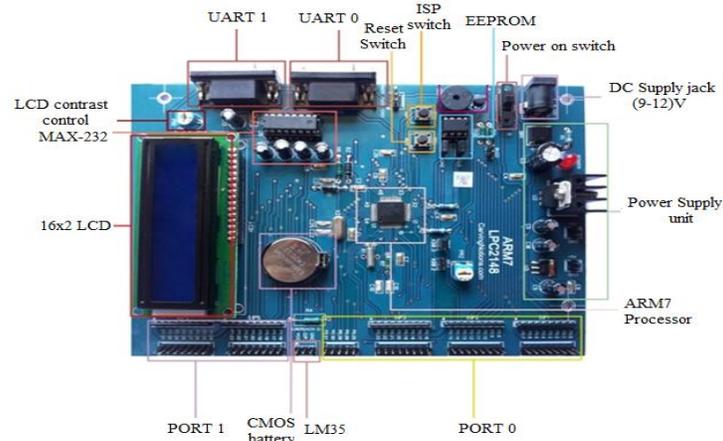


Fig2:-LPC2148 board

### IR SENSORS

The major motive of the use of IR sensor is to detect the obstacle. When the impediment become passing the IR sensor will detects the item. The IR will have the 2 LEDES one for transmitting and one for receiving. The transmitter LED transmits the one signal that signal touches to the objects and pondered to the returned receiver, if the object is within the range the impediment will be detects. In the IR sensor we're the use of the lm358 as comparator circuit. It's far an 8 pin ic, At the first pin we will take the output and eight pin we are able to offers the electricity supply and at the third pin we set the reference the voltage, every time the obstacle turned into the detected the it will get the above the reference voltage. The IR sensor contains the three pins one is for controller pin that we can taken into consideration as the output pin and power supply pins one is vcc and any other one for floor.



Figer3:ir sensor

**RFID:**

We have the two sorts of RFID reader active and passive. In the RFID reader we've the only magnet, inside the RFID reader also have the one magnet , each time we vicinity the card on the reader the magnetic flux may be generate and card variety might be read via the reader. We are the usage of the 5 v electricity deliver. The RFID have the 2 sorts one is lively and some other one is passive. For the energetic one we've the sometime limit , so we need to finish the work within the time only , but in case passive reader we are able to don't have any time restriction we will use the lengthy. This is used for the security cause inside the banks , offices and other security locations.



**Fig4:RFID reader**

**RFID TAGS:**

The RFID playing cards are two types active and passive . The rf tags carries the one variety which is there inside the card we will's visible that card range, and it can have one magnetic coil inside the card while we place the tag on the reader it'll generates a magnetic flux and reads the card range. This card will with theroprietor and the reader with that particular utility. This is used for the security motive.



**Fig 5:RFID cards**

### **L293D:**

The L293D is a quadruple excessive-present day half of-H drivers, it additionally referred to as as line motive force circuit. The L293d is designed to provide bidirectional power currents of up to 1 A at voltages from 4.5 V to 36 V. The driver contains completely 16 pins, in that 4 pins for enter and 4 pins for output. The output pins are connected to the vehicles and input pins are takes from the controller and l293d contains electricity supply pins and two floor pins. The major use of the l293d IC is besides up the voltage levels to run the D.C motor. Here we're taking the four enter pins and four output pins, the D.C motor calls for best pins so we can run motors at a time by way of the use of the l293d motive force IC.

### **Motors:**

Motors are electro mechanical gadgets which can be used for the to convert the electrical alerts into mechanical indicators. The all d.C vehicles are have same internal mechanism, both electromechanically to exchange the route of contemporary waft in a part of the motor. In challenge we're used for to move the motor in precise path. We need to attach the motor to controller thru driver IC handiest.



Fig6:dc motor

## **IV. SOFTWARE DESIGN**

In this proposed contrivance, as we tend to used LPC2148 we wish to use following software package instrumentation to program for it.

1. Keil4 Vision
2. Flash Magic

The Keil4 Vision an IDE for Embedded c programming language. In this IDE, we want to import the utilities and libraries steady with the controller. This IDE may be very extra effortlessly and in person friendly thanks to practice, assemblers, and debuggers in it. It simplifies the manner of embedded simulation and trying coming into conjunction with Hex file technology. The flash magic is a programming application. The C/C++ software program written in IDE could be processed into Hex report i.E. In .Hex format. By the usage of hex report we tend to products the code into microcontroller and carry out application.

## **V. WORKING PROCEDURE**

The essential item of this task is to reduce the wastage of the electricity of inside the buying department shops and increasing the lifestyles span of the lighting fixtures. In the buying department shops the lighting fixtures are constantly may be in the ON condition for that numerous electricity was wasting and lifestyles span of the lighting fixtures additionally decreases because of this we're imposing the "density and LDR based automatic light control in buying department shops.

In this assignment we're used the 2 IR sensors, one for access and every other for go out. The first IR sensor will region at the entry factor for counting the quantity of traffic stepping into the room. The quantity of times detecting the IR that variety of individuals will enters into the room, and one greater IR sensor become location on the exit, this additionally the equal concept no. Of the IR2 changed into detected the IR gets decrements . So if subtract the exit people form the entry men and women we can get the overall no. Of humans in the shopping mall. By way of the use of this overall we can write the matter how many quantity of mild will switch ON.

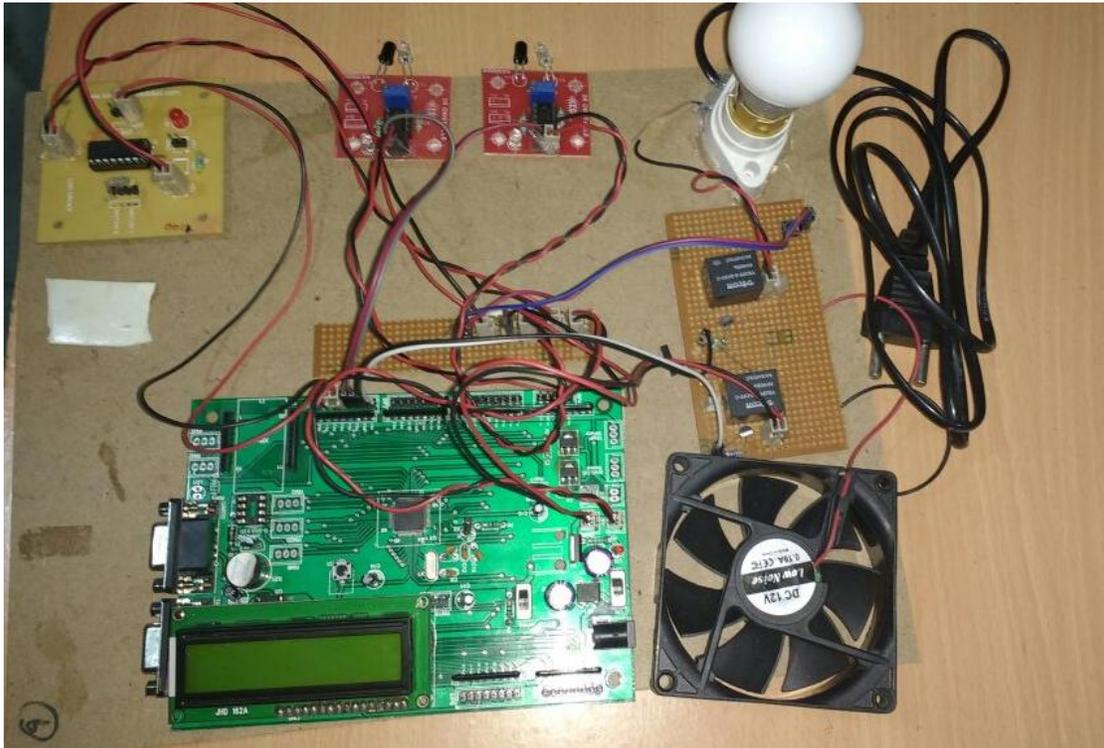
In this assignment on greater ideas is there this is light established resistor. When the LDR turned into detected the light may be off. Whenever the mild detects the resistance of the LDR will get low the voltage may be go with the flow. Here on every occasion the light changed into detected the all lights in the purchasing malls could be transfer off, without counting, whenever the LDR was now not detected the lights can be transfer ON relying upon the depend in the shopping center. If the be counted reaches that precise stage we need to switch ON the a few lights that depending upon our programming.

One more benefit of this task is on every occasion we need to open the door the we need to kind the password from the keypad if the password may be than most effective the door may be opens in any other case the door will not be open that is very useful in safety purpose

Here we have important blessings through the usage of this task one is we are able to lessen the wastage of the power and we can boom the lifestyles span of the bulbs, IR sensors can be used one for access one and another one for go out individuals with the aid of the usage of those we are able to get the be counted if the count will reaches that particular level a few lighting will be turn on relying upon the our programing for that we are able to lessen the wastage of the electricity inside the shopping malls and more is we are imparting the keypad primarily based password for commencing and closing the door.

## **VI. RESULT**

Here the project was successfully completed when IR was detected the all lights will switch off condition if IR was not detected the light will be on depending upon the objects,



## VII. CONCLUSION

By using this project we can reduce the usage of the power in this campus card and we can increase the life span of the bulbs, whenever the count reaches that particular level some lights will be switch ON that is depending upon our requirement, and it will be very useful for security if we want open the door we need to type the password, if password will be match than only door will be opened.

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