



“AUTOMATIC ROOM LIGHT CONTROLLER WITH VISITOR COUNTER”

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ABSTRACT

This Project “Automated Room Light Controller with Visitor Counter” is a reliable circuit that takes over the task of controlling the room lights as well as counting number of persons / visitors in the room very accurately. When somebody enters into the room then the counter is incremented by one and the LED light in the room will be switched ON and when any one leaves the room then the counter is decremented by one. The light will be only switched OFF until all the persons in the room go out. The total number of persons inside the room is also displayed on the LCD.

Keywords: *Arduino Uno, IR Sensor, LCD, Relay*

1. INTRODUCTION

There is a necessity for automatic appliances in day today life. So developing an automatic circuits will be helpful. The main purpose of our system is to save energy and the efforts required to switch on the lights. Instead of switching on/off the lights in an auditorium or a seminar hall the lights adjust the intensity. To make a controller based model to count number of persons visiting particular room and accordingly light up the room.

The objective of this project is a controller based model to count number of persons visiting room and light ON the room. Here use Infrared IR sensor it count the number of Persons in the room. In now a day all are like a automatic systems. With standard of living also increases. Automated Light Controller with Visitor Counter system is controlling the room lights with count number of persons in the room. When anyone enters into the room then the counter will incremented by one(+1) and the light will be switched ON and when any one person leaves from the room then the counter will decremented by one(-1). The light will be switched OFF until all visitors or persons leaves from the room. The total number of visitors or persons inside the room is displayed on the LCD.

BLOCK DIAGRAM:

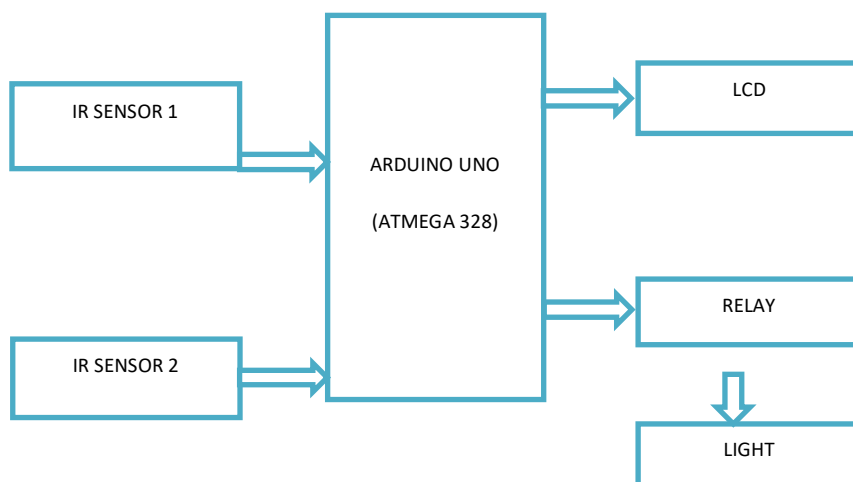


Fig 1: Block Diagram for Project

2. HARDWARE PLATFORM

1. ARDUINO UNO

An Arduino board historically consists of an Atmel 8-,16-or 32-bit AVR microcontroller with complementary components that facilitate programming and incorporation into other circuits. An important aspect of the Arduino is its standard connectors, which let users connect the CPU board to a variety interchangeable add-on module termed shields. Some shields communicate with the Arduino board directly over various pins, but many shields are individually addressable via an I2C serial bus so many shields can be stacked and used in parallel. It provides 14 digital I/O pins, six of which can produce pulse-width modulated signals, and six analog inputs, which can also be used as six digital I/O pins. This board has a 5-volt linear regulator and a 16 MHz crystal oscillator.

2. INFRARED SENSOR MODULE

An infrared sensor is an electronic device that emits in order to sense some aspect of the heat of an object as well as detects the motion. The radiation is invisible to our eyes, which can be detected by an infrared sensor. The emitters is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED.

3. LIQUID CRYSTAL DISPLAY (LCD)

Liquid Crystal Display screen is an electronic display module and find a wide range of applications. A 16*2 LCD display is very basic module and is very commonly used in various devices and circuits. LCD 16*2 is a 16-pin device that has 2 rows that can accommodate 16 character each. LCD 16*2 can be used in 4-bit mode or 8-bit mode. It is also possible to create custom characters. It has 8 data lines and 3 control lines that can be used for control purposes.

4. RELAY-MODULE

Relay is an electromechanical device that uses an electric current to open or close the contacts of a switch. The single channel relay module is much more than just a plain relay, it comprise of components that make switching and connection easier and act as indicators to show it the module is powered and if the relay is active or not.

3. RESEARCH METHODOLOGY

The basic operation of this project is when a person enters in that area the IR sensor activates. Depending upon the switch position the operation will change. When one person enters the room the IR sensor 1 the transmitted infrared waves from IR transmitter reflects from that object and is received by the IR receiver. IR sensor gives 0 or LOW in this condition and it displays the number of persons on the 16*2 LCD display. Even if there is one person in the room light will automatically in the ON state and displays 1 on LCD display, When a person leaves the room i.e., when person passes through IR sensor 2, the decreases the count of number of people inside the room and finally if number of people inside the room becomes zero the light automatically switches to OFF state.

Arduino enables users to monitor various kinds of sensors such as IR sensor and motion detectors in real time. The analog and digital pins on the Arduino board can serve as General Purpose Input and Output pins (GIPO). Usually, The ATmega328 microcontroller embedded on the Arduino board contains the analog to digital converter (ADC). When Arduino check for zero condition (Zero condition means no one in the room) and finds it is true then Arduino turn off the bulb by deactivating the relay through transistor. If zero condition is false then Arduino turns on the light. Here is two functions for enter and exit. This increment or decrement is displayed in LCD.

4. INTERFACING DIAGRAM

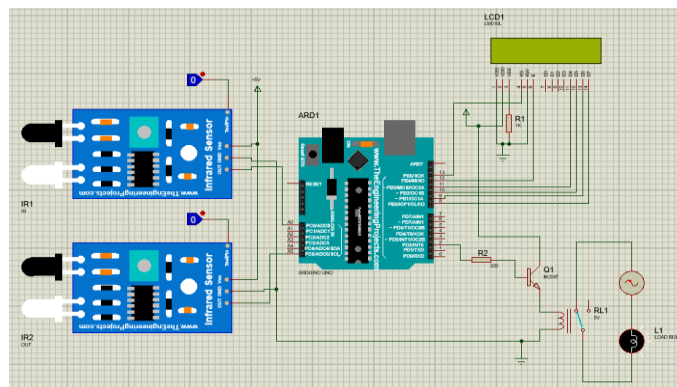


Fig 2: Interfacing Diagram

5. DATAFLOW OF SYSTEM

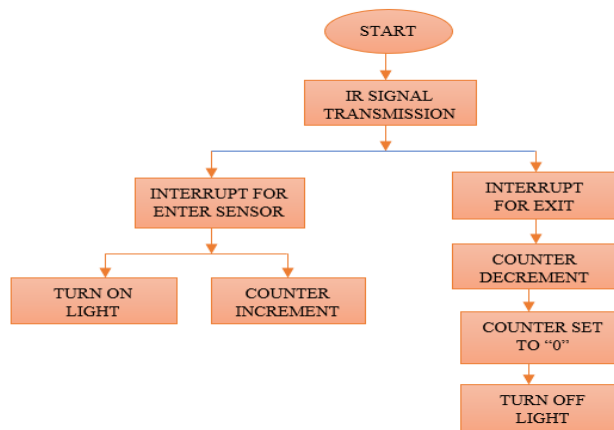


Fig 3: Dataflow of System

If the sensor 1 (In) is interrupted first then the Arduino will look for the sensor 2 (Exit). If it is interrupted then the Arduino will increment the count. When the first person enter the room then the counter goes to 1 and that time the light will turn ON.

If the sensor 2 is interrupted first then the Arduino will look for the sensor 1. If it is interrupted then the Arduino will decrement the count. When the last person leaves the room then the counter goes to 0 and that time the light will turn OFF.

6. RESULT

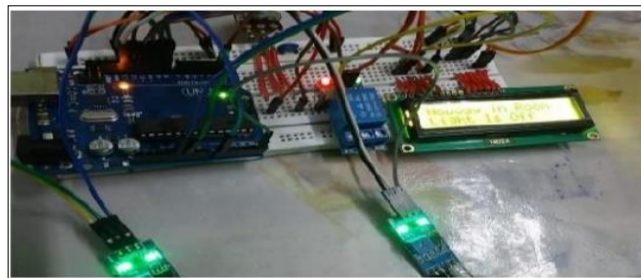


Fig 4: Project Model



Fig 5: Nobody in the room & light is turn OFF



Fig 6: Person enters in the room, LCD shows no. of person 1 & Light is turn OFF

7. FUTURE SCOPE

- Voice alarm system can be added.
- By using this circuit and proper power supply we can implement various applications such as Fans, Tube Lights etc.
- Task of opening and closing the door can be added.

8. CONCLUSION

In this digital world technology is very advanced and we prefer things to be done automatically without any human efforts. It is very useful in Schools, Hospitals, Malls, Offices, and Auditoriums etc.

This system becomes helping hand in such situation because it gives the count on LCD display. Also it controls the lighting system automatically according to how many individuals are there in a room.

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