

BIDIRECTIONAL VISITOR COUNTER USING ARDUINO

k. Venkata Kavitha¹, M. Naga Sushma¹, T. Adi Seshulu¹, N. Chandrasekhar¹,
M.Koteswara rao²

¹Student, ECE, Chalapathi Institute of Engineering and Technology, Lam, Guntur.

²Assistant Professor, ECE, Chalapathi Institute of Engineering and Technology, Lam, Guntur.

ABSTRACT: - The project of “Bidirectional visitor counter” is based on the interfacing of some components such as sensors, display etc. with arduino microcontroller. Bidirectional visitor device is a device through which we can able to count number of people entering the room and leaving the room, in this we will connect a LCD to the device which will show the no.of people present in the room. This device is widely used in public areas or in the conference mostly. Often we see visitor counters at stadium, mall, offices, class rooms etc. The working of this device and all details are given in this report.

KEYWORDS: - Arduino Uno, 16x2 LCD Display, IR Sensors.

1. INTRODUCTION

Many times we need to monitor the person/people visiting some place like Seminar hall, conference room or Shopping mall or temple. This project can be used to count and display the number of visitors entering inside any conference room or seminar hall. This is a bidirectional counter which means it works in a two way. That means counter will be incremented if person enters the room and will be decremented if a person leaves the room. LCD displays this value which is placed outside the room. This system is helpful for counting the number of people in an auditorium or halls for seminar to avoid congestion. Moreover it can also be used to check the number of people who have come to an event or a museum to watch a certain exhibit. Microcontroller is a reliable circuit that takes over the task of counting the number of persons/ visitors in the room very accurately. We will be showing both In count i.e. number of people entering the room and Out count i.e. number of people exiting the room on a 16x2 Alphanumeric LCD. An IR sensor is used to monitor the person entering and exiting the room.

The microcontroller does the above job. It receives the signals from the sensors, and this signal is operated under the control of software which is stored in ROM. Microcontroller 89s52 continuously monitor the Infrared Receivers. When any object pass through the IR Receiver's then the IR Rays falling on the receiver are obstructed, this obstruction is sensed by the Microcontroller.

2. 2. PROPOSED METHODOLOGY

This project is divided in four parts: sensors, controller, counter display and gate. The sensor would observe an interruption and provide an input to the controller which would run the counter increment or decrement depending on entering or exiting of the person. And counting is displayed on a 16x2 LCD through the controller. When any one enters in the room, IR sensor will get interrupted by the object then other sensor will not work because we have added a delay for a while.

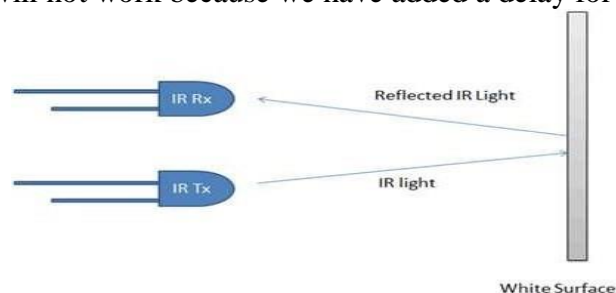


Figure 1: IR Sensor

There are some sections of whole visitor counter circuit that are sensor section, control section, display section and driver section.

Sensor section: In this section we have used two IR sensor modules which contain IR diodes, potentiometer, Comparator (Op-Amp) and LED's.

Potentiometer is used for setting reference voltage at comparator's one terminal and IR sensors sense the object or person and provide a change in voltage at comparator's second terminal. Then comparator compares both voltages and generates a digital signal at output. Here in this circuit we have used two comparators for two sensors. LM358 is used as comparator. LM358 has inbuilt two low noise Op-amp.

Control Section: Arduino UNO is used for controlling whole the process of this visitor counter project. The outputs of comparators are connected to digital pin number 14 and 19 of arduino. Arduino read these signals and send commands to relay driver circuit to drive the relay for light bulb controlling. If you find any difficulty in working with relay, check out this tutorial on arduino relay control to learn more about operating relay with Arduino.

Display section: Display section contains a 16x2 LCD. This section will display the counted number of people and light status when no one will in the room.

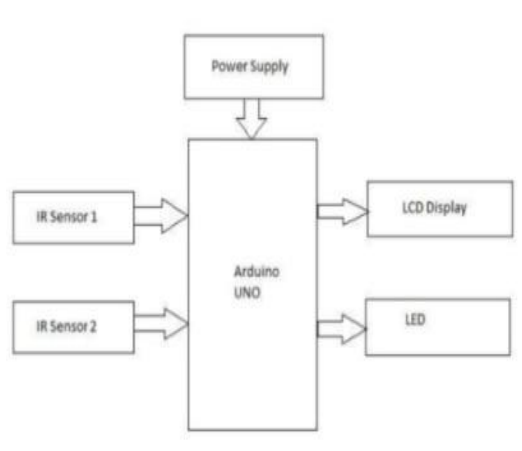


Figure 2: Bidirectional visitor counter block diagram

Relay Driver section: Relay driver section consist a BC547 transistor and a 5 volt relay for controlling the light bulb. Transistor is used to drive the relay because arduino does not supply enough voltage and current to drive relay. So we added a relay driver circuit to get enough voltage and current for relay. Arduino sends commands to this relay driver transistor and then light bulb will turn on/off accordingly.

3. Program Code

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27, 16, 2);
#define irIN 2
#define irOUT 3
#define buz 12 int count =0; void setup()
{
  // put your setup code here, to run once: pinMode(irIN,INPUT_PULLUP);
  pinMode(irOUT,INPUT_PULLUP);
  pinMode(buz,OUTPUT);
  Serial.begin(9600); lcd.begin(); lcd.backlight(); lcd.clear(); } int ct=0; int stat = 0; void loop()
{
```

```
// put your main code here, to run repeatedly:
if(digitalRead(irIN)==LOW)
{ count= count+1; Serial.print("Hum-Value ="); Serial.println(count); lcd.setCursor(0,0);
  lcd.print(" Person Count:");

  lcd.print(count);
  lcd.print(" ");
  //digitalWrite(buz,HIGH); delay(2000);
  digitalWrite(buz,LOW);
  }
  else {

  Serial.println(count);          lcd.setCursor(0,0); }          lcd.setCursor(0,0);
  lcd.print(" Person Count:");          }          lcd.print(" Person Count:");
                                          lcd.print(count);
                                          lcd.print(" ");

  lcd.print(count); lcd.print(" ");
  delay(2000);
  } else {
  lcd.setCursor(0,0); lcd.print(" Person Count:"); lcd.print(count); lcd.print(" ");
  }
if(count>=10)
{
  digitalWrite(buz,HIGH);
} else {
  digitalWrite(buz,LOW);
```

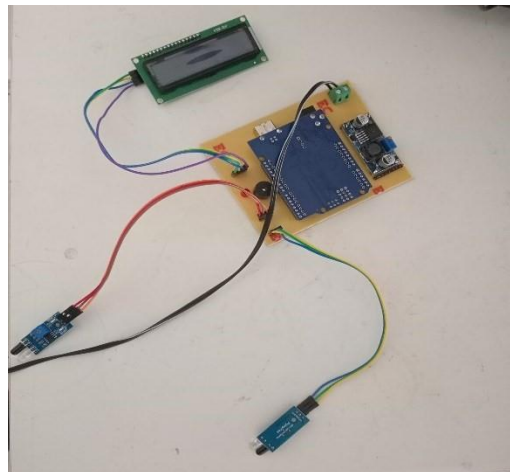


Figure 3: Bidirectional Visitor Counter

4. CONCLUSION

In today's world, there is a need to reduce the manual work in order to reduce the complexity of life. This project will help us to count the number of persons entering or leaving the room. By using this circuit in proper way with sufficient power supply, we can implement it for electronic appliances also as the most advantage is it saves electricity. As the whole system works automatically it reduces the human work.



5. REFERENCES

1. <https://circuitdigest.com/microcontroller-projects/automatic-room-light-controller-with-bidirectional-visitor-counter-using-arduino>
2. https://www.google.com/search?q=bidirectional+visitor+counter+using+arduino+image&safe=strict&srf=ACYBGNQ-S59emTDMdkA4w2p15xBbr_L9Rg:1571829660433&source=lnms&tbn=isch&sa=X&ved=0ahUKEwjNsbk-obLIhUc6nMBHUcdA_cQ_AUIEygC&biw=1517&bih=675#imgrc=1GPRLMfifCn_hM:
3. S. M. Mohaiminul Islam; Dept. of Computer Science, South Asian Univ., New Delhi, India ; Md. MahbubE- Noor, S. M. Tanvir Siddiquee Simulation of energy efficient Bi-directional