



A Minor Project Report
ON
AUTOMATIC ROOM LIGHT VISIT COUNTER

Submitted in partial fulfilment of requirements for the award of the

Degree of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

Under the guidance of

Ms.S.SUBASELVI

Submitted By

BHALARAM KRISHNA S A (927621BEC025)

BALADEVA K (927621BEC019)

DHILIP KUMAR R (927621BEC046)

HARRISH SUNDAR A (927621BEC062)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous)

KARUR – 639 113

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M.KUMARASAMY COLLEGE OF ENGINEERING, KARUR

BONAFIDE CERTIFICATE

Certified that this project report “**AUTOMATIC ROOM LIGHT VISIT COUNTER**” is the bonafied work of BHALARAM KRISHNA S A(927621BEC025), BALADEVA K(927621BEC019), DHILIP KUMAR R(927621BEC046), HARRISH SUNDAR A (927621BEC062) who carried out the project work carried out the project work under my supervision in the academic year 2021-2022.

SIGNATURE

Dr.S.PALANIVEL RAJAN M.E.,
Ph.D.,D.litt(USA)

HEAD OF THE DEPARTMENT

PROFESSOR

Department of Electronics and
Communication Engineering,
M.Kumarasamy College of Engineering,
Thalavapalayam, Karur-639113

SIGNATURE

Ms.S.SUBASELVI

SUPERVISOR

ASSISTANT PROFESSOR

Department of Electronics and
Communication Engineering,
M.Kumarasamy College of
Engineering, Thalavapalayam,
Karur-639113

This project report has been submitted for the **18ECP106L-Minor Project** Viva
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_____.

Vision and Mission of the Institute and Department

Vision

To emerge as a leader among the top institutions in the field of technical education.

Mission

- ❖ Produce smart technocrats with empirical knowledge who can surmount the global challenges.
- ❖ Create a diverse, fully-engaged, learner-centric campus environment to provide quality education to the students.
- ❖ Maintain mutually beneficial partnerships with our alumni, industry and professional associations.

Department of Electronics and Communication Engineering

Vision

- ❖ To empower the Electronics and Communication Engineering students with Emerging Technologies, Professionalism, Innovative Research and Social Responsibility.

Mission

- ❖ Attain the academic excellence through innovative teaching learning process, research areas & laboratories and Consultancy projects.
- ❖ Inculcate the students in problem solving and lifelong learning ability.
- ❖ Provide entrepreneurial skills and leadership qualities.
- ❖ Render the technical knowledge and industrial skills of faculties.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

- ❖ **PEO1:** Graduates will have a successful career in academia or industry associated with electronics and communication engineering.
- ❖ **PEO2:** Graduates will provide feasible solutions for the challenging problems through comprehensive research and innovation in the allied areas of electronics and communication engineering.
- ❖ **PEO3:** Graduates will contribute to the social needs through lifelong learning, practicing professional ethics and leadership quality

PROGRAM OUTCOMES (PO'S)

- ❖ **PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
- ❖ **PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
- ❖ **PO3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
- ❖ **PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

- ❖ **PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
- ❖ **PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
- ❖ **PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
- ❖ **PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
- ❖ **PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
- ❖ **PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
- ❖ **PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
- ❖ **PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

- ❖ **PSO1:** Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.
- ❖ **PSO2:** Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrial expectations.

MAPPING OF PROJCT WITH POs AND PSO

Abstract	Matching with POs, PSOs

ABSTRACT

A human has become too busy, and is unable to find time even to switch the lights wherever not necessary. Hence, this paper aims at designing and executing the advanced development in embedded systems for energy saving of street lights. The present system is like, the street lights will be switched on in the evening before the sun sets and they are switched off the next day morning after there is sufficient light on the roads. This paper gives the best solution for electrical power wastage. Also the manual operation of the lighting system is completely eliminated. In this paper the two sensors are used which are Light Dependent Resistor LDR Sensor to indicate a day/night time and the photoelectric sensors to detect the movement on the street. The microcontroller PIC16F877A is used as brain to control the street light system, where the programming language used for developing the software to the microcontroller is C-language. Finally, the system has been successfully designed and implemented as prototype system.

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CHAPTER 1

INTRODUCTION OF PROJECT

The objective of this project is to make a controller based model to count number of persons visiting particular room and accordingly light up the room. Here we can use sensor and can know present number of persons. In today's world, there is a continuous need for automatic appliances. With the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life. Also if at all one wants to know the number of people present in room so as not to have congestion, this circuit proves to be helpful. This project "automatic room light controller with visitor counter using microcontroller" is a reliable circuit that takes over the task of persons/visitor in the room very accurately. When somebody enters into the room will be switched ON and when anyone. The light in room will be only switched OFF until all the persons in the room go out. The total number of persons inside the room also displayed on the seven segment displays. 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. Micron roller AT89S52 continuously monitor the infrared receivers, when any object passes through the IR rays falling on the receivers are obstructed this obstruction is sensed by the microcontroller.

1.1 Project overview

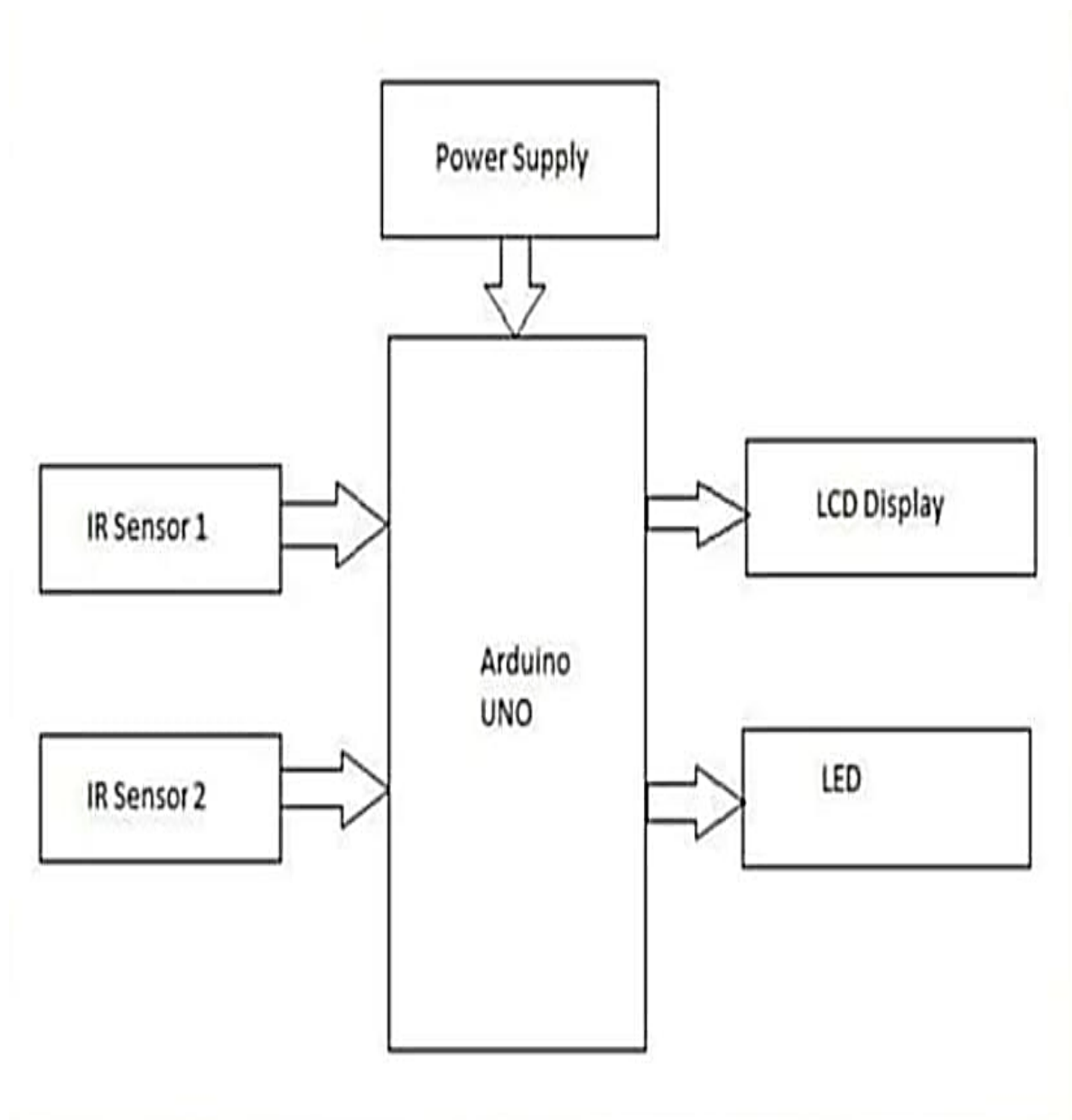
This Project Automatic Room Light Controller with Visitor Counter using Microcontroller is a reliable circuit that takes over the task of controlling the room lights as well as counting number of persons/ visitors in the room very accurately. When somebody enters into the room then the counter is incremented by one and the 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 seven segment displays. 8 “AUTOMATIC ROOM LIGHT CONTROLLER WITH BIDIRECTIONAL VISITOR COUNTER” 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 AT89S52 continuously monitor the Infrared

Receivers, when any object passes through the IR Receiver's then the IR Rays falling on the receiver are obstructed, this obstruction is sensed by the microcontroller.

CHAPTER 2

BLOCK DIAGRAM AND ITS DESCRIPTION

2.1. BLOCK DIAGRAM



2.2 Block diagram description

The basic block diagram of the bidirectional visitor counter with automatic light controller is shown in the above figure. Mainly this block diagram consists of the following essential blocks.

- Power Supply
- Entry and Exit sensor circuit
- AT 89S52 micro-controller
- Relay driver circuit

1. Power Supply

Here we used +12V and +5V dc power supply. The main function of this block is to provide the required amount of voltage to essential circuits. +12voltage is given. +12V is given to relay driver. To get the +5V dc power supply we have used here IC 7805, which provides the +5V dc regulated power supply.

2. Enter and Exit Circuits

This is one of the main parts of our project. The main intention of this block is to sense the person. For sensing the person and light we are using the light dependent register (LDR). By using this sensor and its related circuit diagram we can count the persons.

3. 89S52 Microcontroller

It is a low-power, high performance CMOS 8-bit microcontroller with 8KB of Flash Programmable and Erasable Read Only Memory (PEROM). THE device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the MCS-51TMinstruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bitCPU with Flash on a monolithic chip, the Atmel AT89S52 is a powerful. 12 “AUTOMATIC ROOM LIGHT CONTROLLER WITH BIDIRECTIONAL VISITOR COUNTER”

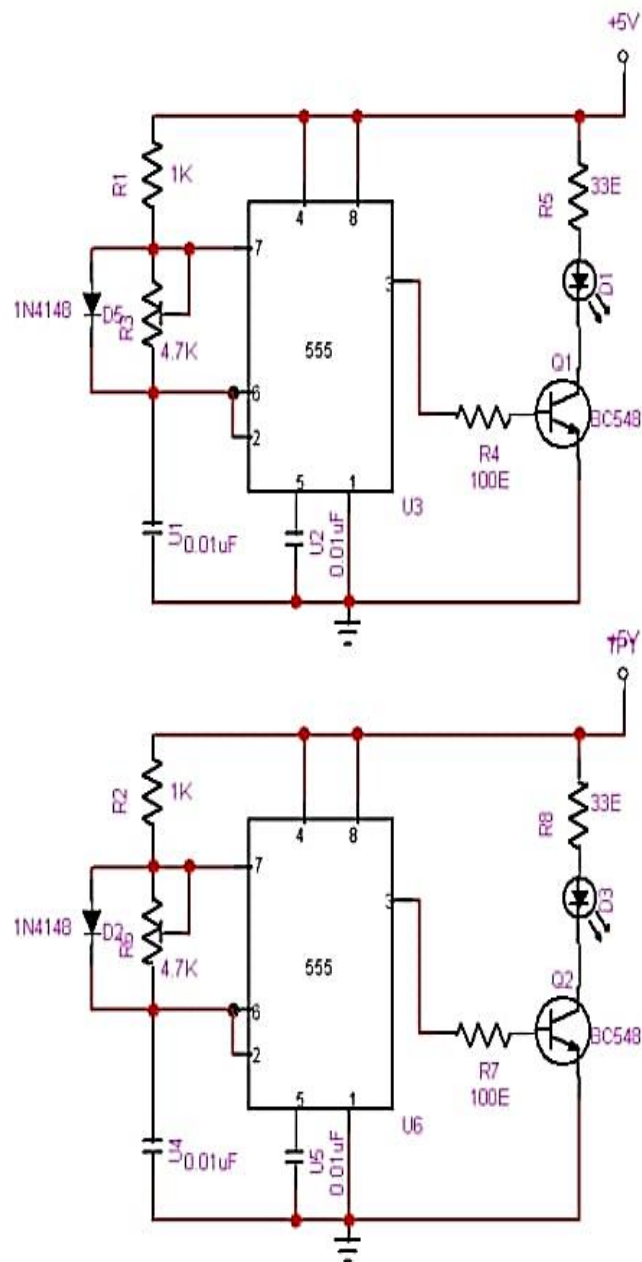
4. Relay Driver Circuit

This block has the potential to drive the various controlled devices. In this block mainly we are using the transistor and the relays. One relay driver circuit we are using to control the light. Output signal from AT89S52 is given to the base of the transistor, which we are further energizing the particular relay. Because of this appropriate device is selected and it do its allotted function.

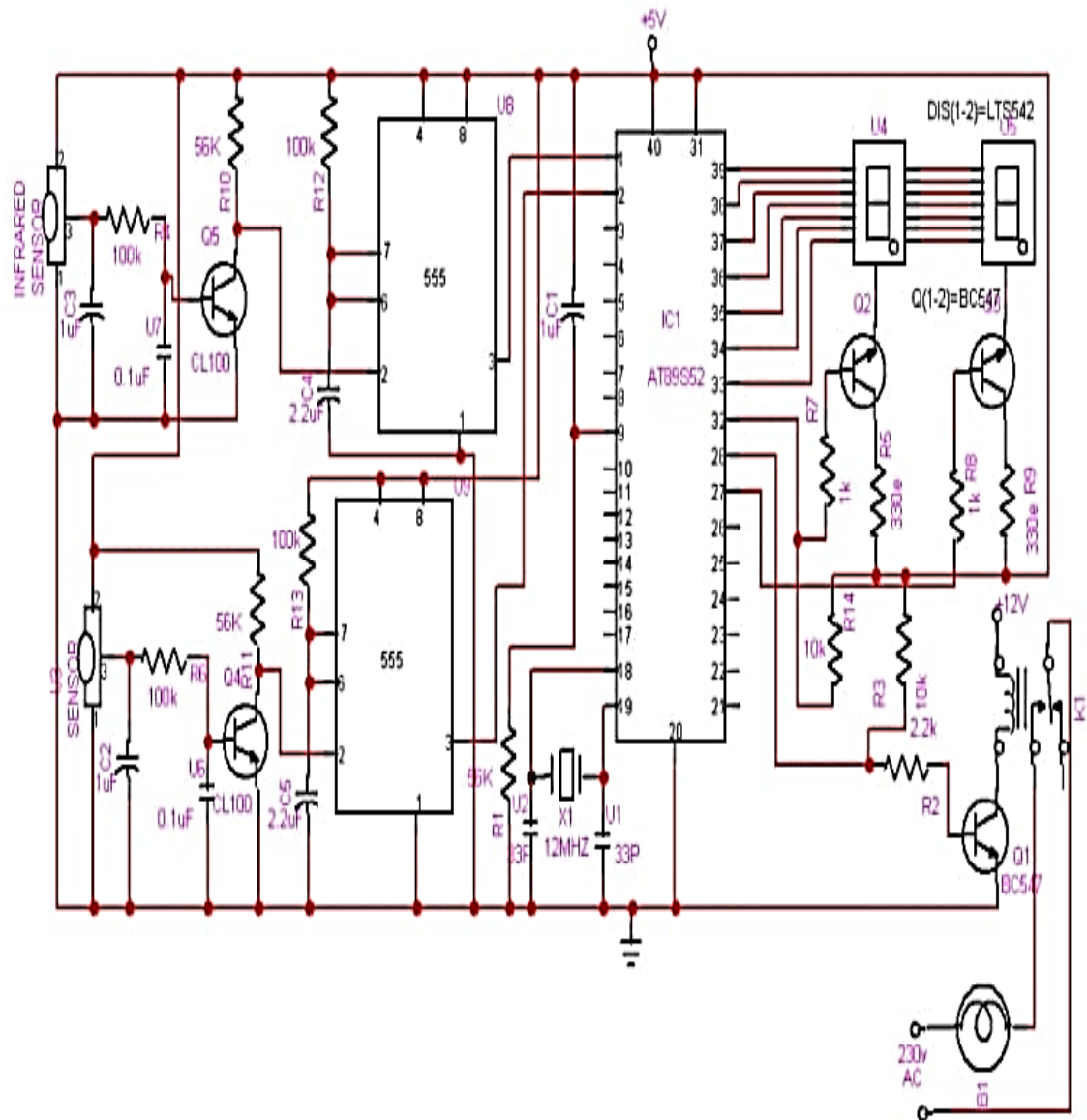
CHAPTER 3

SCHEMATIC DIAGRAM & CIRCUIT DIAGRAM

3.1 TRANSMISSION CIRUCUIT



AUTOMATIC ROOM LIGHT CONTROLLER



The IR transmitter will emit modulated 38 kHz IR signal and at the receiver we use TSOP1738 (Infrared Sensor). The output goes high when there is an interruption and it return back to low after the time period determined by the capacitor and resistor in the circuit i.e. around 1 second. CL100 is to trigger the IC555 which is configured as monostable multivibrator. Input is given to the Port 1 of the microcontroller. Port 0 is used for the 7-Segment display purpose. Port 2 is used for the Relay Turn On and Turn off Purpose. LTS 542 (Common Anode) is used for 7-Segment display and that time Relay will get voltage and triggered, so light will get voltage and it will turn on and when counter will be 00 and at that time Relay will be turned off. Reset button will reset the microcontroller.

CHAPTER 4

LIST OF COMPONENTS

4.1. LIST OF COMPONENTS

- ARDUINOUNO
- IR SENSOR
- LCD DISPLAY
- RELAY MODULE
- BREAD BOARD

CHAPTER 5

DESCRIPTION OF COMPONENTS

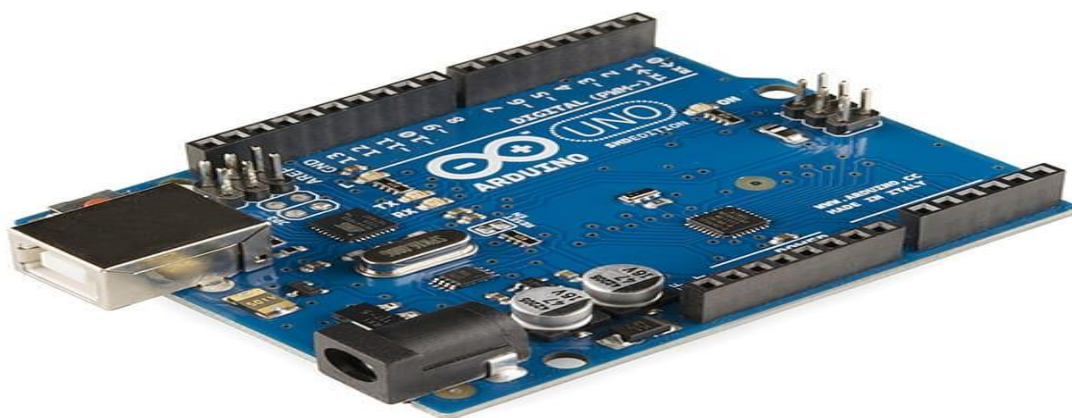
5.1 DESCRIPTION OF COMPONENTS

1.ARDUINOUNO BOARD

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button.

FEATURES

- It is an easy USB interface. This allows interface with USB as this is like a serial device.
- It has a 32 KB of flash memory for storing your code.
- An on-board LED is attached to digital pin 13 to make fast the debugging of code and to make the debug process easy.



2.IR SENSORS

An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with a spectral sensitivity in the infrared wavelength range 780 nm ... 50 μ m. IR sensors are now widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.

FEATURES

- 5VDC Operating voltage
- I/O pins are 5V and 3.3V compliant
- Range: Up to 20cm
- Adjustable Sensing range
- Built-in Ambient Light Sensor
- 20mA supply current
- Mounting hole



3. LCD DISPLAY

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome

FEATURES

- High quality product with 100% perfect fit.
- Use it with your existing and working touch screen digitizer.
- Tested before shipping (QC done).
- Brand new product with manufacturing defect warranty



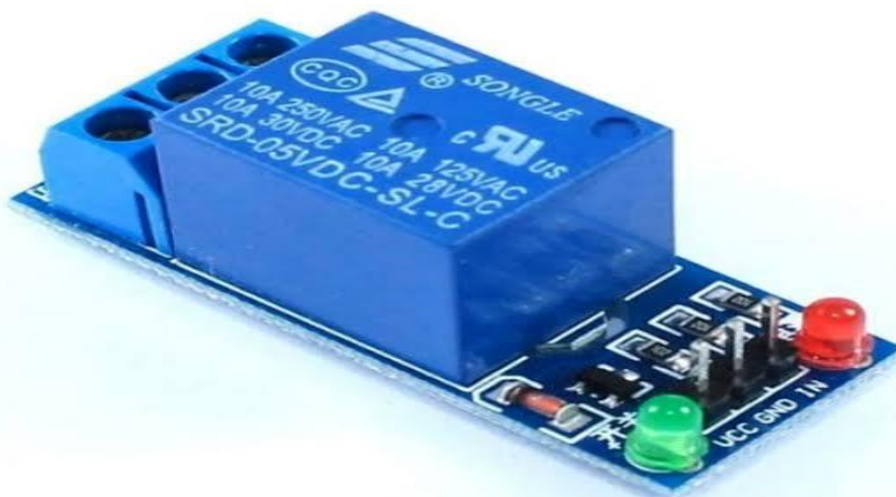
4.RELAY MODULE

A power relay module is an electrical switch that is operated by an electromagnet. The electromagnet is activated by a separate low-power signal from a micro controller. When activated, the electromagnet pulls to either open or close an electrical circuit.

FEATURES

There are many features in our Parametric Filter for choosing a relay for your application.

- Lighted Indicator. Example: 480-6227-ND....
- Mechanical Indicator....
- Test Button....
- Resistor....
- Diode, Surge Protection, Varistor and RC Circuit. ...
- Debounce Delay....
- Magnetic Blowout.

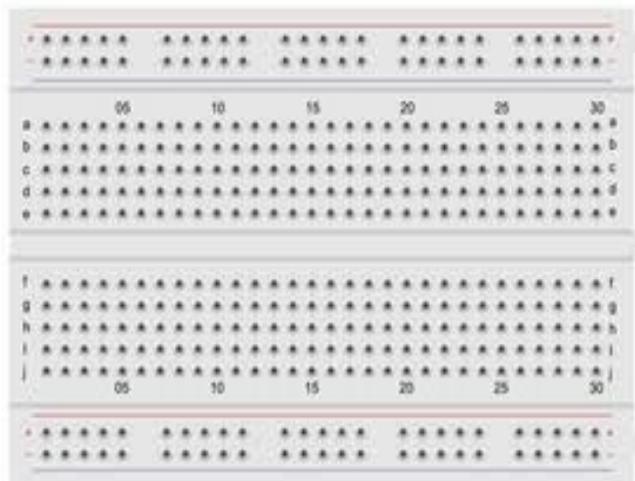


5.BREADBOARD

A breadboard consists of plastic block holding a matrix of electrical sockets of a size suitable for gripping thin connecting wire, component wires or the pins of transistors and integrated circuits (ICs). The sockets are connected inside the board, usually in rows of five sockets.

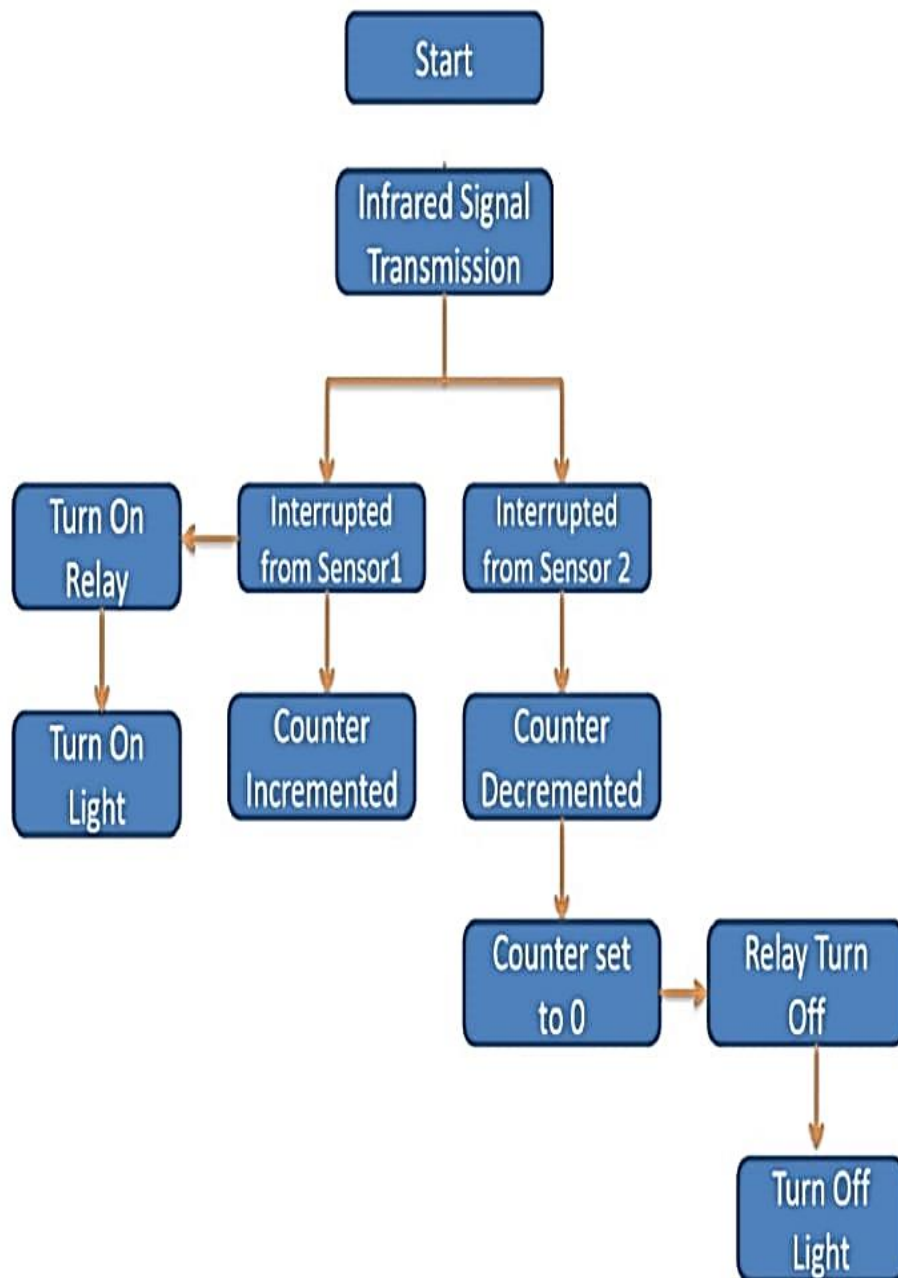
FEATURES

- Height / Thickness: 0.5118 inch.
- Length: 7.87 to 47.24 inch.
- Units: Metric.
- Width: 7.87 to 47.24 inch



CHAPTER 6

PROJECT FLOW CHART



CHAPTER 7

PROJECT PROGRAM

```
#include <Wire.h>

#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0X27,16,2);

int in=3;

int out=5;

int in_val;

int out_val;

int led=6;

int count=0;

void setup() {

    // put your setup code here, to run once:

    pinMode(in,INPUT);

    pinMode(out,INPUT);

    pinMode(led,OUTPUT);

    lcd.begin

    ();

    lcd.backlight();

}
```

```
void loop() {  
    // put your main code here, to run repeatedly:  
    in_val=digitalRead(in);  
    out_val=digitalRead(out);  
    if(in_val==LOW) {  
        count++;  
        lcd.print("no of people");  
        lcd.setCursor(0,1);  
        lcd.print(count);  
        delay(1000);  
        lcd.clear();  
    }  
    else if(out_val==LOW) {  
        count--;  
        lcd.print("no of people");  
        lcd.setCursor(0,1);  
        lcd.print(count);  
        delay(1000);  
        lcd.clear();  
    }  
    else if(count==0) {
```

```
digitalWrite(led,HIGH);  
lcd.setCursor(0,0);  
lcd.print("no one in room");  
lcd.setCursor(0,1);  
lcd.print("led is off");  
delay(1000);  
lcd.clear();  
}  
else{  
    digitalWrite(led,LOW);  
}  
}
```

CHAPTER 8

PROJECT WORKING

The microcontroller monitors the input continuously which sensor is interrupted is find to decide the increment or decrement the counter first sensor one is interrupted so counter increment by one and relay will turn on and light will be ON. If sensor two is interrupted counter will decrement and check the counter, counter is 0 relay will be turn of and light also off. Interfacing diagram opening and closing the door system. Nobody in the room so light is OFF

CHAPTER 9

ADVANTAGES AND APPLICATION

Advantages

- Low cost
- Easy to use
- Implement in single door

Application:

- For counting purposes
- For automatic room light control

CHAPTER 10

FUTURE SCOPE

- By using this circuit and proper power supply we can implement various applications Such as fans, tube lights, etc.
- By modifying this circuit and using two relays we can achieve a task of opening and closing the door.

CHAPTER 11

REFERENCE BOOKS & WEBSITES

Reference Books

- Programming in ANSI C: E BALAGURUSAMY
- The 8051 microcontroller and embedded systems:
MUHAMMAD ALI MAZIDI JANICE GILLISPIE
MAZIDI
- The 8051 microcontroller: KENNETH J. AYALA

Website

- www.datasheets4u.com
- www.8051.com