BIRLA VISHVAKARMA MAHAVIDYALAYA ENGINEERING COLLEGE

Department of Electronics Engineering

Subject: **MINI PROJECT (EL341)**

Report On

AUTOMATIC PRIORITY TRAFFIC MANAGEMENT SYSTEM

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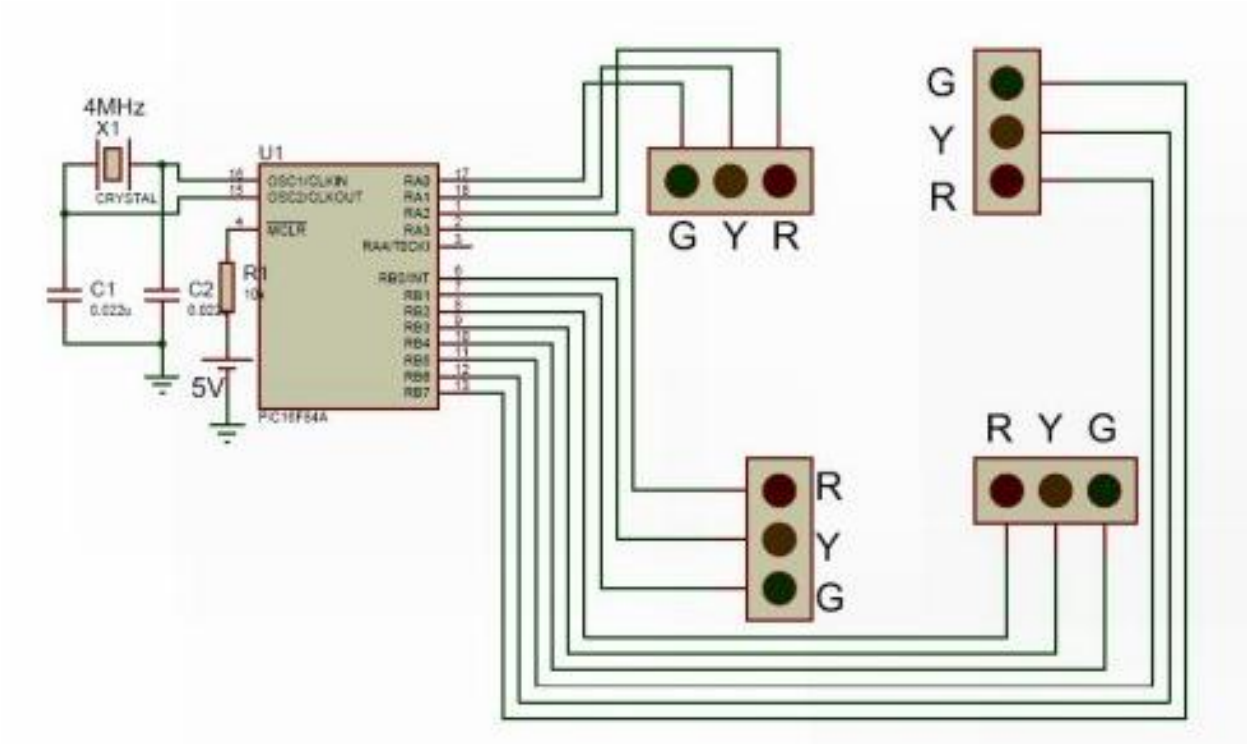
AIM

To construct Automatic priority traffic management system using RFID

INTRODUCTION

With the increase in traffic in cities and towns the need for upgrading traffic management also arises. The existing traffic system is not autonomous and also not even fully established in India. So when it comes to road traffic accidents. More than 50% of deaths occurred due to delay in reaching ambulance. This project gives us a cheap and efficient way to establish new traffic signals which is automatically controls the traffic signal accordingly.

CIRCUIT DIAGRAM:



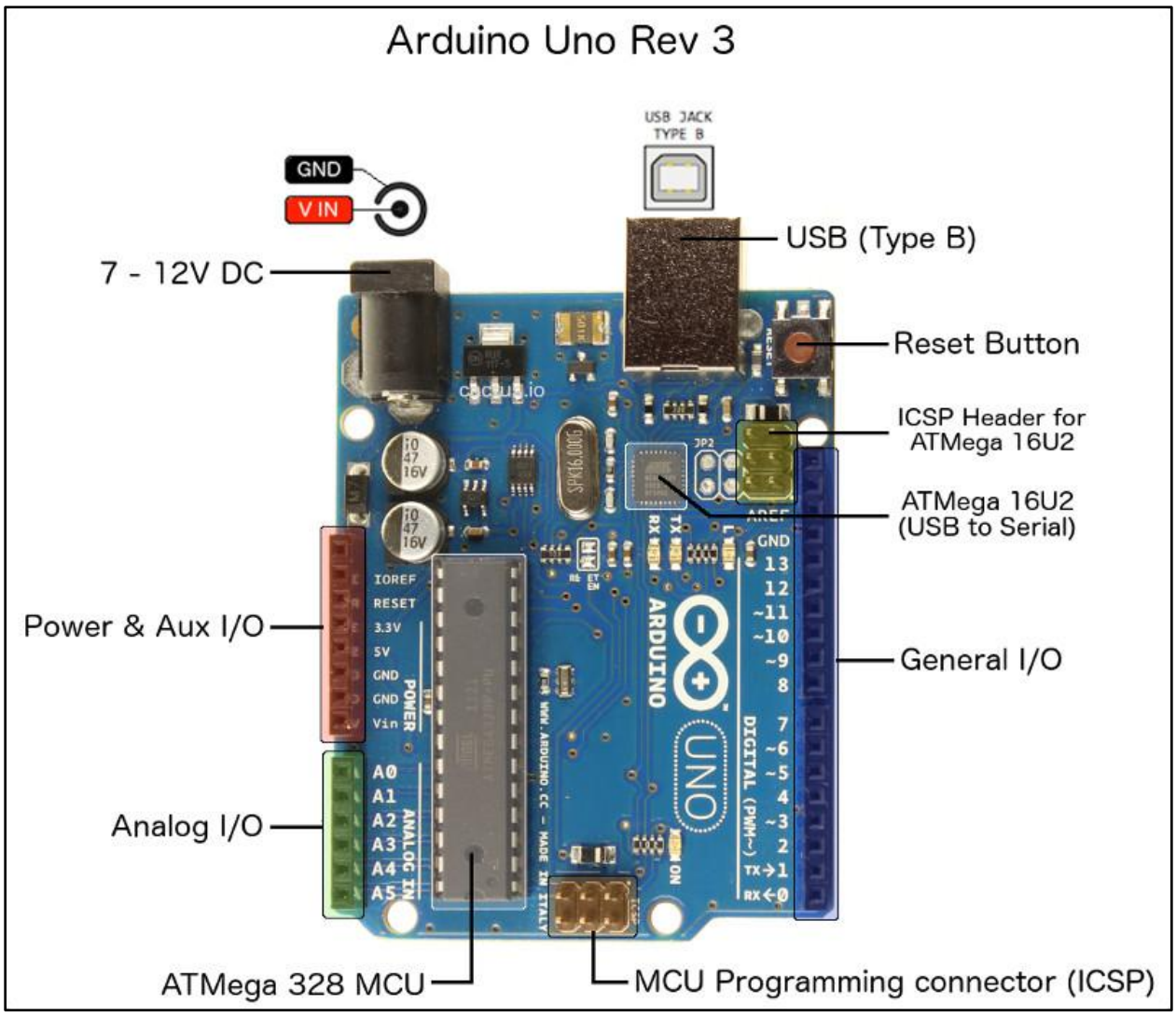
COMPONENTS USED IN THIS PROJECT

- ARDIUNO UNO
- RFID RECEIVER EM-18
- LEDS
- RFID TAGS

ARDUINO

The Arduino UNO is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc .The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board features 14 Digital pins and 6 Analog pins. It is programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts.

- Microcontroller: ATmega328P
- Operating Voltage: 5v
- Input Voltage: 7-20v
- Digital I/O Pins: 14 (of which 6 provide PWM output)
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Flash Memory: 32 KB of which 0.5 KB used by bootloader
- SRAM: 2 KB
- EEPROM: 1 KB
- Clock Speed: 16 MHz
- Length: 68.6 mm
- Width: 53.4 mm
- Weight: 25 g



LED

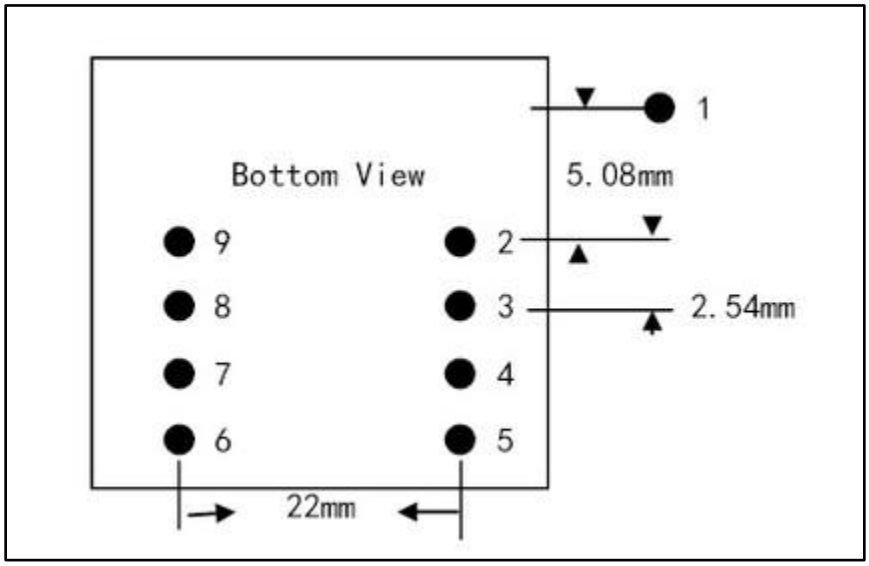
A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode that emits light when activated. When a suitable current is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence.

RFID EM18

The EM-18 RFID Reader module operating at 125 kHz is an inexpensive solution for your RFID based application. The Reader module comes with an on-chip antenna and can be powered up with a 5V power supply. Power-up the module and connect the transmit pin of the module to receive pin of your microcontroller. Show your card within the reading distance and the card number is thrown at the output. Optionally the module can be configured for also a weigand output.

Specifications:

- 5VDC through USB (External 5V supply will boost range of the module)
- Current: <50mA
- Operating Frequency: 125Khz
- Read Distance: 10cm
- Size of RFID reader module: 32mm(length) * 32mm(width) * 8mm(height)



Basal Specifications:

1	VCC	5V
2	GND	GND
3	BEEP	BEEP AND LED
4	ANT	NO USE
5	ANT	NO USE
6	SEL	HIGH IS RS232,LOW IS WEIGAND
7	RS232	RS232
8	D1	WEIGAND DATA 1
9	D0	WEIGAND DATA 0

RFID TAG

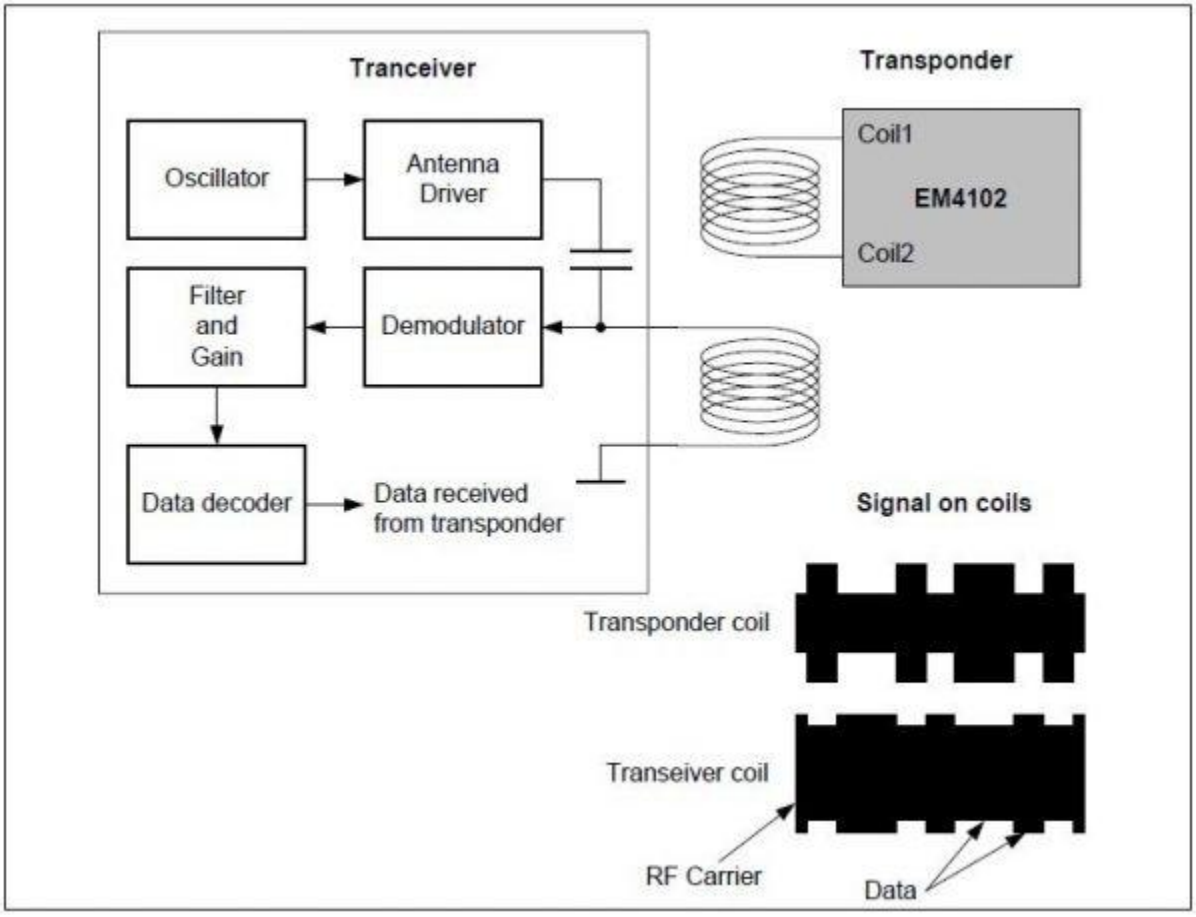
A Radio Frequency Identification Tag (RFID tag) is an electronic tag that exchanges data with a RFID reader through radio waves. Most RFID tags are made up of at least two main parts. The first is an antenna, which receives radio frequency (RF) waves. The second is an integrated circuit (IC), which is used for processing and storing data, as well as modulating and demodulating the radio waves received/sent by the antenna. A RFID tag is also known as a RFID chip.

WORKING

The working is simple whenever any priority vehicles like ambulance, fire brigade truck pass through the RFID receiver which is installed at some distance before cross road then it will automatically turn the light to green in the lane in which it is coming. Hence this will save the time when the ambulance will reach at the cross road. The traffic signal will only change the light if registered RFID is encountered. So, fake vehicle will not be able to change the traffic light.

WORKING OF RFID EM18

The module radiates 125 KHz through its coils and when a 125 KHz passive RFID tag is brought into this field it will get energized from this field. These passive RFID tags mostly consist of CMOS IC EM4102 which can get enough power for its working from the field generated by the reader. By changing the modulation current through the coils, tag will send back the information contained in the factory programmed memory array.



PROGRAM

```
int g1 = 13;
int y1 = 12;
int r1 = 11;
int g2 = 10;
int y2 = 9;
int r2 = 8;
int g3 = 7;
int y3 = 6;
int r3 = 5;
int g4 = 4;
int y4 = 3;
int r4 = 1;
int count = 0;
char input[12];
boolean flag = 0;
int ty = 1000;
int tg = 3000;
void setup() {
  Serial.begin(9600);
  pinMode (r1, OUTPUT);
  pinMode (y1, OUTPUT);
  pinMode (g1, OUTPUT);
  pinMode (r2, OUTPUT);
  pinMode (y2, OUTPUT);
  pinMode (g2, OUTPUT);
  pinMode (r3, OUTPUT);
  pinMode (y3, OUTPUT);
  pinMode (g3, OUTPUT);
  pinMode (r4, OUTPUT);
  pinMode (y4, OUTPUT);
  pinMode (g4, OUTPUT);
  attachInterrupt(0, rfid, HIGH);
}
void loop()
{
  lane1();
  lane2();
  lane3();
  lane4();
}

void lane1()
{
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, HIGH);
  digitalWrite(y2, HIGH);
  digitalWrite(y3, LOW);
  digitalWrite(y4, LOW);
  delay(ty);
  digitalWrite(g1, HIGH);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);
  digitalWrite(r1, LOW);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, LOW);
  digitalWrite(y2, LOW);
  digitalWrite(y3, LOW);
  digitalWrite(y4, LOW);
  delay(tg);
}
void lane2()
{
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, LOW);
  digitalWrite(y2, HIGH);
  digitalWrite(y3, HIGH);
  digitalWrite(y4, LOW);
  delay(ty);
```

```
  digitalWrite(g1, LOW);
  digitalWrite(g2, HIGH);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);

  digitalWrite(r1, HIGH);
  digitalWrite(r2, LOW);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);

  digitalWrite(y1, LOW);
  digitalWrite(y2, LOW);
  digitalWrite(y3, LOW);
  digitalWrite(y4, LOW);
  delay(tg);
}
void lane3()
{
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, LOW);
  digitalWrite(y2, LOW);
  digitalWrite(y3, HIGH);
  digitalWrite(y4, HIGH);
  delay(ty);
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, HIGH);
  digitalWrite(g4, LOW);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, LOW);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, LOW);
  digitalWrite(y2, LOW);
  digitalWrite(y3, LOW);
  digitalWrite(y4, LOW);
  delay(tg);
}
void lane4()
{
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, LOW);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, HIGH);
  digitalWrite(y1, HIGH);
  digitalWrite(y2, LOW);
  digitalWrite(y3, LOW);
  digitalWrite(y4, HIGH);
  delay(ty);
  digitalWrite(g1, LOW);
  digitalWrite(g2, LOW);
  digitalWrite(g3, LOW);
  digitalWrite(g4, HIGH);
  digitalWrite(r1, HIGH);
  digitalWrite(r2, HIGH);
  digitalWrite(r3, HIGH);
  digitalWrite(r4, LOW);
  digitalWrite(y1, LOW);
  digitalWrite(y2, LOW);
  digitalWrite(y3, LOW);
  digitalWrite(y4, LOW);
  delay(tg);
}
void rfid()
{
  if (Serial.available())
  {
    count = 0;
    while (Serial.available() && count <
12)
    {
      input[count] = Serial.read();
      count++;
      delay(5);
    }
    Serial.print(input);

    Serial.println("ambulance ");
    lane1();
```

MERITS

- Low cost
- Power efficient
- Simple
- Easy to construct

DEMERITS

- Very basic so that more better approach is needed to implement

CONCLUSION

Hence, we implement such type of traffic signal approach so that we can avoid many deaths occurring due to traffic and road delays.