TOPIC – GAS SMOKE ALARM

SUBJECT	EMBEDDED TECHNOLOGY AND IOT	SUBMITTED TO:	PROF. DINESH SINGH
SECTION	6	PROGRAM	B.TECH
SEMSTER	2	SUBJECT CODE	BEE1T1004

NAME

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ABSTRACT

A smoke detector alarm is a fire protection device that automatically detects smoke and also gives us warning. In the proposed system, a smoke detector upon senses smoke activates its alarm, sends a low voltage signal to all other smoke detectors in the vicinity. This low voltage signal activates the individual relays in the other smoke detectors causing them to emit a tone that alerts residents that one of the smoke detectors senses smoke. In this system the transmitter and receiver are installed in a unit and the need for a base is eliminated. The individual smoke detectors are equipped with all the electronics required to both send and receive signals. They are battery operated and therefore they require no external connections. They can be installed by a homeowner just as they would a normal smoke detector. The proposed design is aiming to have Cost efficient system, Compact design, easily expandable, Simple to install, Replaceable components. The system was tested indoor and outdoor with different distance and with the presence of noise. Standard for Safety of Smoke Alarms, to measure the performance of a large number of existing smoke alarms. The standard calls for additional fire tests with smoldering and flaming polyurethane foam as well as a broiling hamburgers cooking nuisance test. The research included 45 distinct smoke alarm models. Analysis of the results

showed that no current smoke alarm model would likely meet the new test performance levels required in ANSI/UL 217-2015.

KEYWORDS

Smoke detector alarm(buzzer) , Jumper Wire , Arduino , MQ2 Smoke sensor, Battery

INTRODUCTION

A smoke alarm is a device that senses smoke, typically as an indicator of fire. It may issue a signal to a fire alarm control panel as part of fire alarm system, especially in commercial security devices or may issue a local audible or

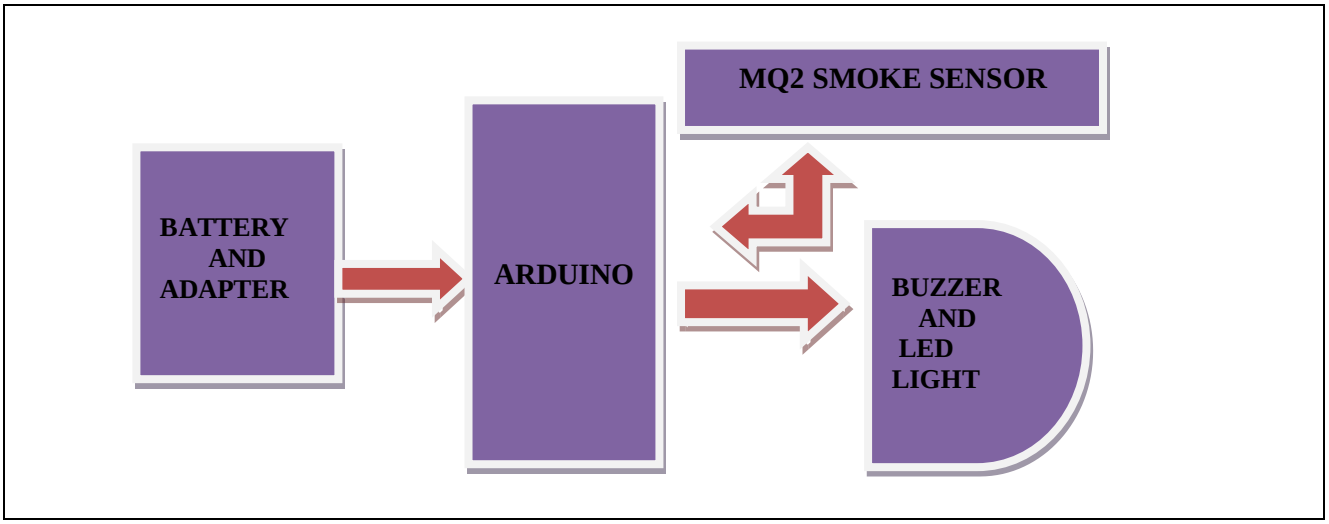
visual alarm in the household. Smoke can be detected either optically (photoelectric) or by physical process(ionization). Detectors may use either or both methods. Smoke detectors have prior detection when compared with heat detectors, hence are preferred for fire detection. They also find application in detecting, and thus deter smoking in premises where is it banned.

WORKING PRINCIPLE:

Also in order tworking principle of these detectors in the environment, several researches was embarked. Accurate prediction of smoke detector is a very significant way of assessing detector system performance because occupants and fire service notification can be dependent upon smoke detector response. Fire Dynamic Simulator software, can be used to predict the response of smoke detector . Reference stated that “fire loss data reveals that in

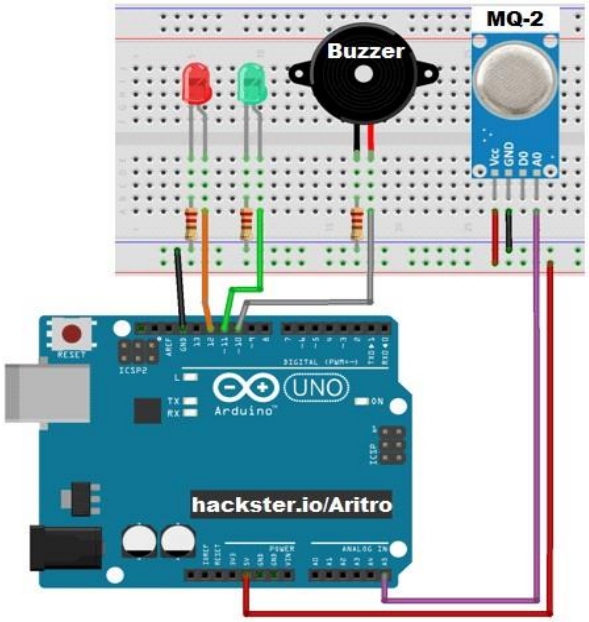
buildings with automatic sprinklers, 96% were controlled and extinguished by these system.

BLOCK DIAGRAM :

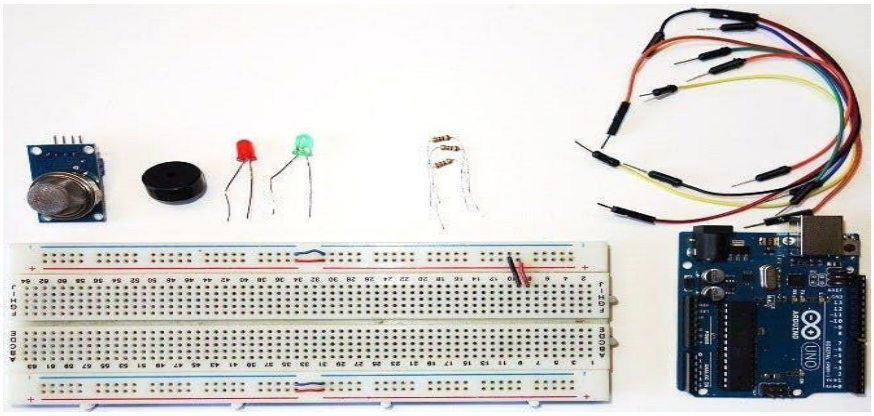


HARDWARE DESIGN AND COMPOUNDS:

SCHEMATIC DIAGRAM :

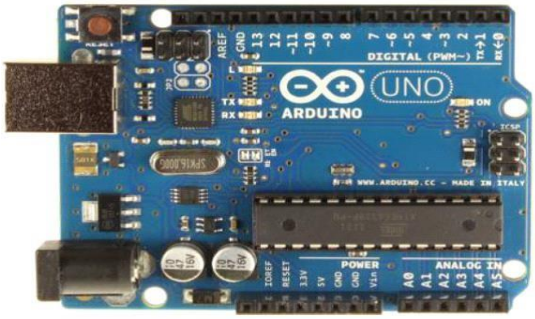


TYPE OF COMPONENTS :



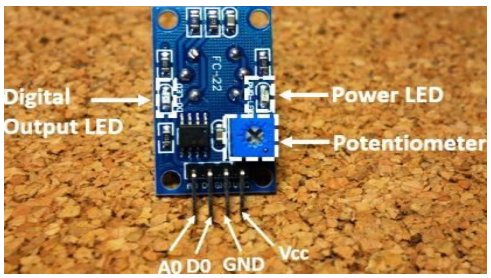
HARDWARE COMPONENTS :

ARDUINO UNO :



The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). 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. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

MQ2 SENSOR:



The MQ2 sensor module was selected to serve the purpose of sensing smoke. It has the capability of sensing smoke and other combustible gases. The following are the reasons as to why it was selected:

- Wide detecting scope
- Fast response & high sensitivity

- Stable and long life
- Simple drive circuit

The MQ-2 smoke sensor is sensitive to smoke and to the following flammable gases:

LPG

Butane

Propane

Methane

Alcohol

Hydrogen

The resistance of the sensor is different depending on the type of the gas.

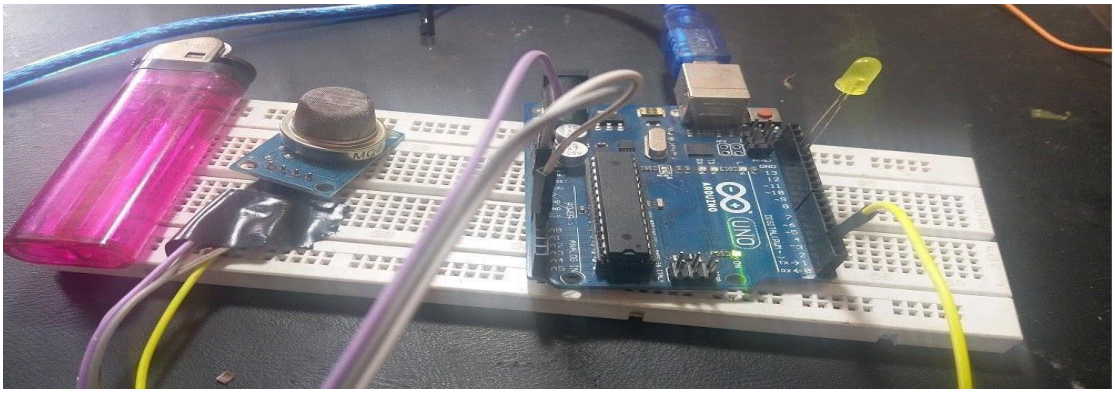
The smoke sensor has a built-in potentiometer that allows you to adjust the sensor sensitivity according to how accurate you want to detect gas .

BUZZER:

A buzzer is an audio signalling device which may be used in alarm devices, timers and other forms of alerts. They may be mechanical, electromechanical, or piezoelectric.

Electromechanical buzzers use a relay connected to interrupt its own actuating current, causing the contacts to buzz. Mechanical buzzers are purely mechanical and require drivers. Piezo electric elements are driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. For this project, the buzzer used is the compact, pin terminal type electromagnetic buzzer with 2048 Hz output. Pin type terminal construction enables direct mounting onto printed circuit boards.

RESULT:

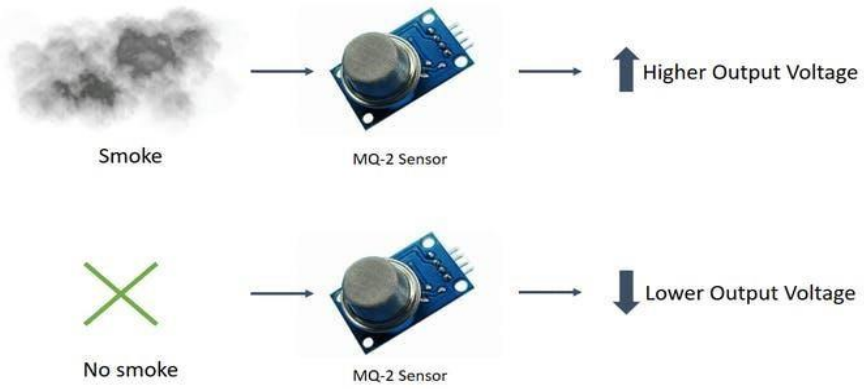


OVERALL VIEW OF THE KIT

WORKING OF SMOKE DECTECTOR ALARM:

The voltage that the sensor outputs changes accordingly to the smoke/gas level that exists in the atmosphere. The sensor outputs a voltage that is proportional to the concentration of smoke/gas. In other words, the relationship between voltage and gas concentration is the following:

- The greater the gas concentration, the greater the output voltage
- The lower the gas concentration, the lower the output voltage



PROGRAM :

```
#define BUZZER_PIN 3

void setup()
{
  pinMode(BUZZER_PIN, OUTPUT);
  //Serial.begin(9600);
}

void loop()
{
  int sensorValue = analogRead(A0);
```

```
  //Serial.println(sensorValue);
  if (sensorValue > 200)
  {
    analogWrite(BUZZER_PIN, 50);
  }
  else
  {
    analogWrite(BUZZER_PIN, 0);
  }
  delay(3000);
}
```

Conclusion :

When it come to Fire safety, it's best to have a smoke detector in every bedroom and hall way, as well as on every floor in our home . with so many smoke detector ,we can rest assured our home is protected from the unthinkable. Smoke detector is one of the easiest and low costly. Most of industries use it, because it work fatly to protect and most effective .This system can be of great in domestic as well as industrial settings to detect smoke and alert people on an impending fire since smoke is a precursor for fire, instead of relying on heat/temperature sensors which sounds alarm when the fire has already started. This can go a long way in

helping to save human life. This system can also be used to detect and deter smokers in areas where smoking is prohibited .The cost of implementing this system is relatively low since the components used are relatively cheap and are easily available in the market. The single microcontroller can be used to interface several sensors with alarms located in different locations as long as more pins are freed for multiple inputs multiple outputs. This system comes with a power supply that can be directly plugged to the mains (240V AC)source and give the appropriate operating voltage. we can use the project fire accidents can be controlled to a great extract in a place such as forests, home ,colleges industries ,trains and some other public places. Fire accidents leads to deaths of excess of people ,by using this technique we can save those life's easily .To detects the chain smokers(which are hazardous to health).

THANK YOU