GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

DATE	18 November 2022
TEAM ID	PNT2022TMID26516
PROJECT NAME	GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

An Introduction To IoT-Based Gas Leakage Detection And Monitoring Systems :

Safety plays a critical role in today's world and it is vital that certain solutions are implemented in places of work and living. Whether it is electricity or oil and gas, working or living in hazardous conditions demand certain safety protocols.

Liquefied Petroleum Gas (LPG) is a type of natural gas liquefied under extreme pressure and contained in a metal cylinder. LPG is extremely sensitive to fire and causes a great disaster if exposed to any fire source without precaution

LPG is more widely available than any other natural gas and is primarily used for cooking. Unfortunately, its broad use makes the event of gas leakage or even a blast standard. Therefore, there is a need to develop a gas leakage detection and monitoring system.

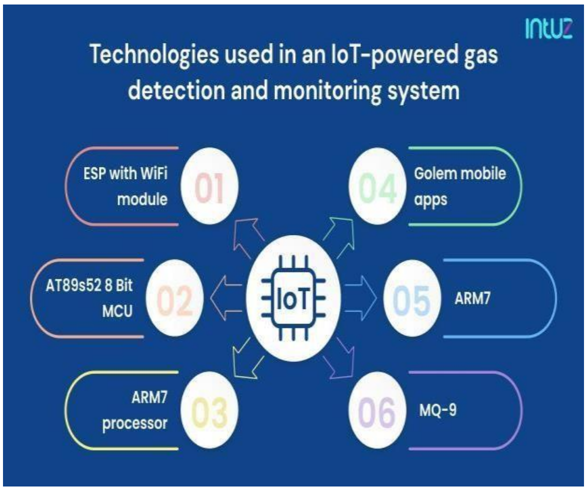
The solution could detect gas leakage, send an alert to the end-user via an SMS or a buzzer, and feature an exhaust fan that gets activated once the gas or fire is detected.

Suppose the gas in the cylinder indicates a value where the remaining percentage level falls below the threshold level set for gas. In that case, the gas cylinder company should be notified immediately to refill the cylinder or replace it. The sensor is also handy for monitoring gas usage over a period.

Benefits of IoT-based apps used in gas leakage detection :

A human nose comprises 400 different types of scent receptors that enable us to smell approximately 1 trillion various odour. However, most of us cannot identify between the different gasses present in the atmosphere. That is where gas detection sensors come in handy.

They are most commonly used to develop an IoT-powered system and identify the variation of toxic gasses in an industrial facility. It helps benefit the refineries and factories by safeguarding them from unexpected threats such as gas leakage and explosions. Here are the top benefits of IoT-based apps used in gas leakage detection.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Technologies used in an IoT-powered gas detection and monitoring system

01 ESP with WiFi module

02 AT89s52 8 Bit MCU

03 ARM7 processor

04 Golem mobile apps

05 ARM7

06 MQ-9

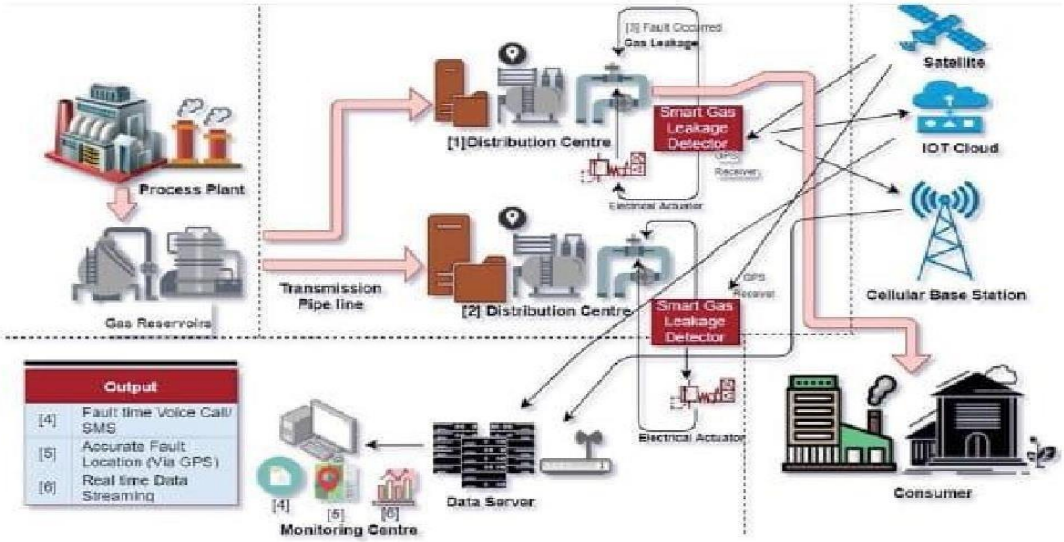
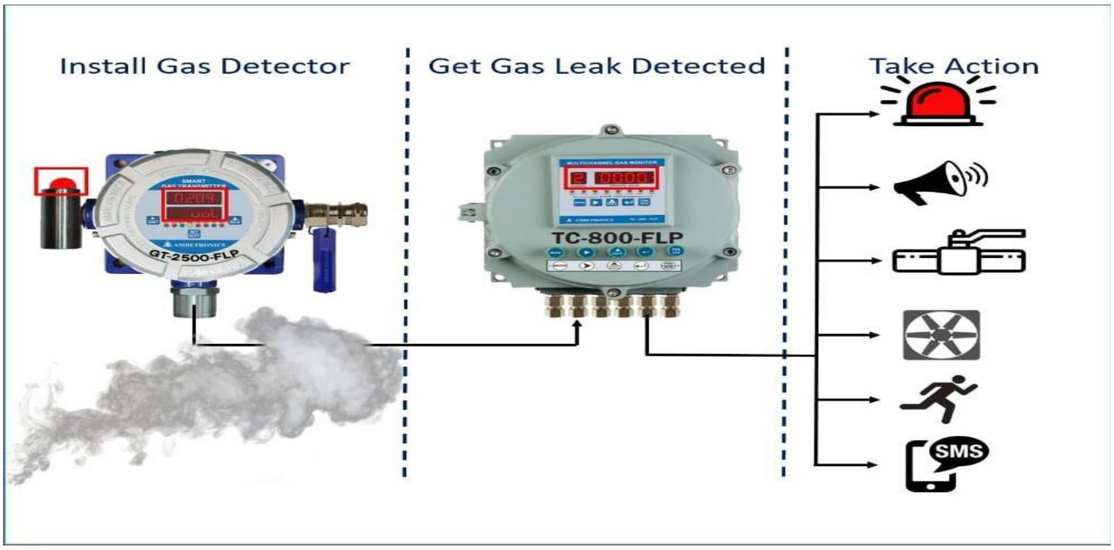
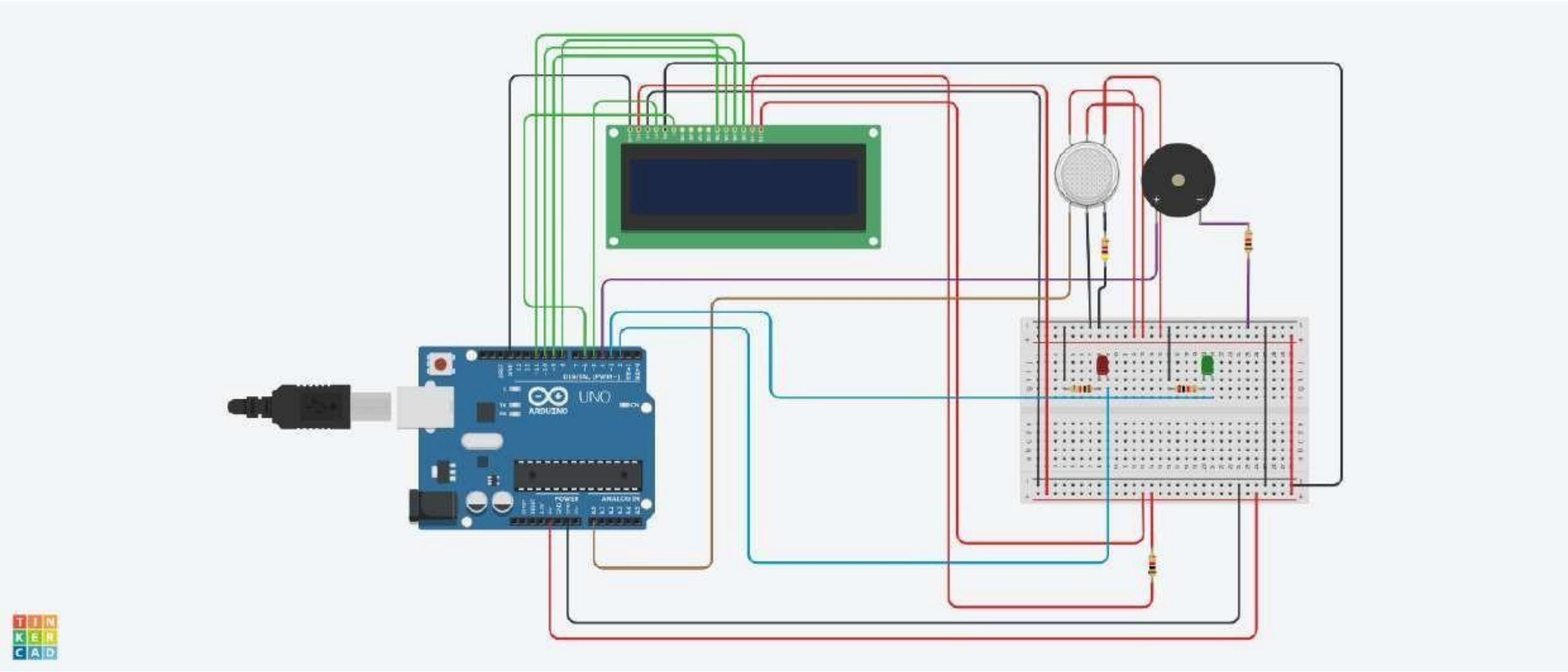


Figure 6. System and control diagram of outdoor gas leakage detection.

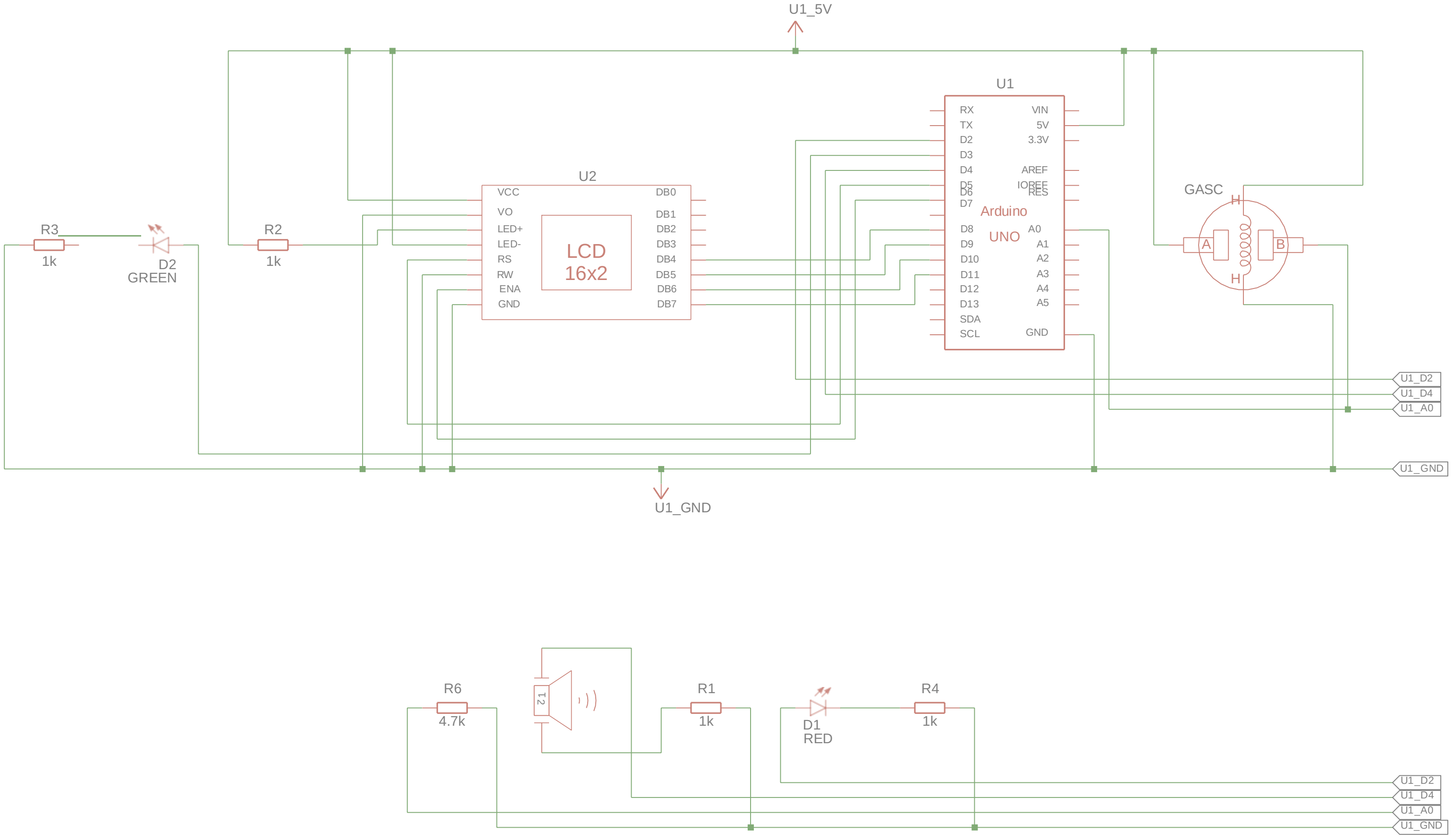


CIRCUIT DIAGRAM:

https://www.tinkercad.com/things/dgmsD2r8Vgn-brilliant-bigery-hillar/editel?tenant=circuits



SCHEMATIC DIAGRAM:



Title: Gas detection sensor

Date: 11/15/2022, 7:43:28 PM

Sheet: 1/1

Made with Tinkercad®

CODE:

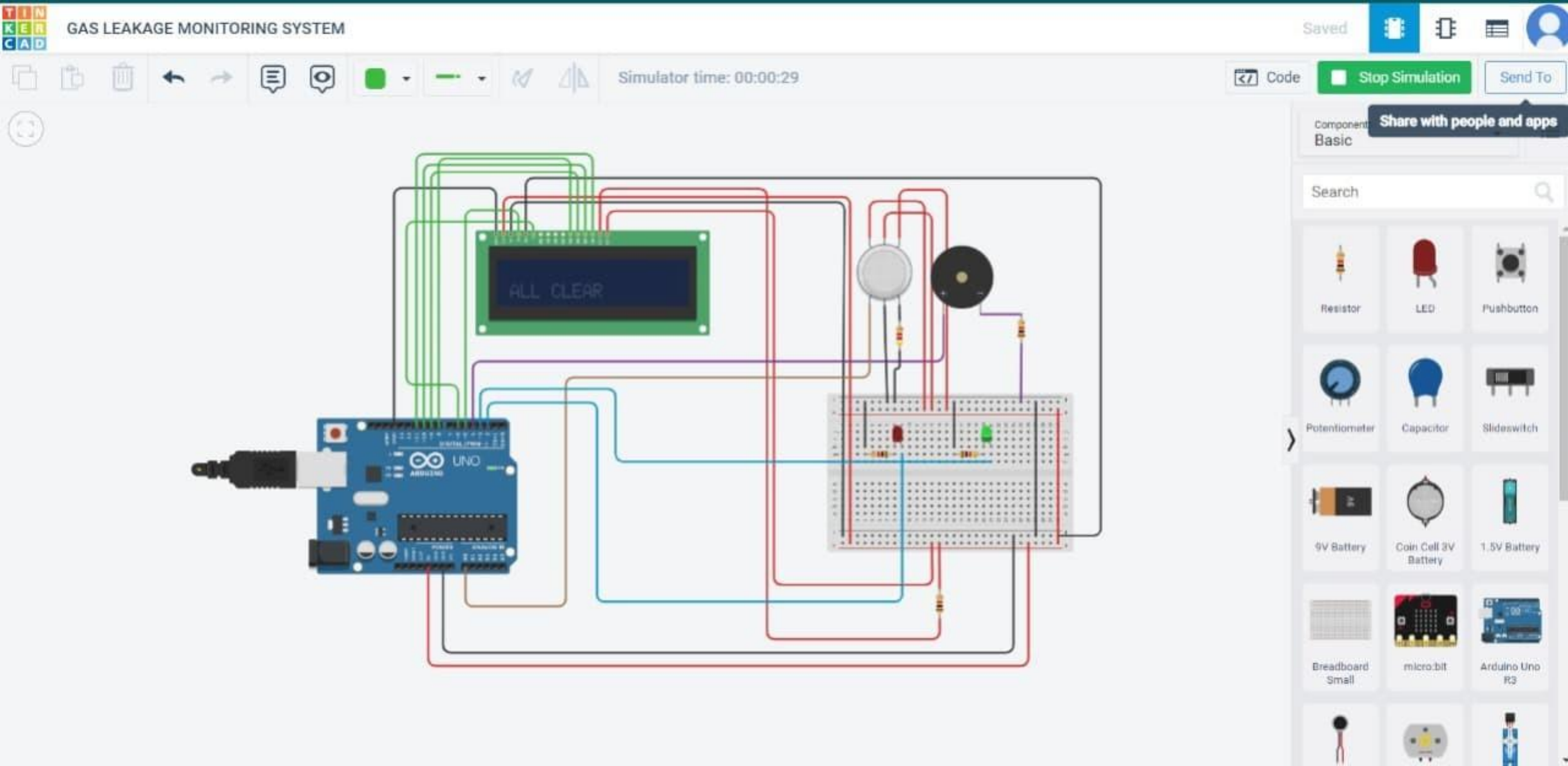
```
#include <LiquidCrystal.h>
LiquidCrystal lcd(5,6,8,9,10,11);

int greenled = 2;
int redled = 3;
int buzzer = 4;
int sensor = A0;
int sensorThresh = 200;

void setup()
{
pinMode(greenled, OUTPUT);
pinMode(redled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
}

void loop()
{
  int analogValue = analogRead(sensor);
  Serial.print(analogValue);
  if(analogValue>sensorThresh)
  {
    digitalWrite(greenled,HIGH);
    digitalWrite(redled,LOW);
    tone(buzzer,1000,10000);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("ALERT");
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("EVACUATE");
    delay(1000);
  }
  else
  {
    digitalWrite(redled,HIGH);
    digitalWrite(greenled,LOW);
    noTone(buzzer);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("SAFE");
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("ALL CLEAR");
    delay(1000);
  }
}
```

OUTPUTS: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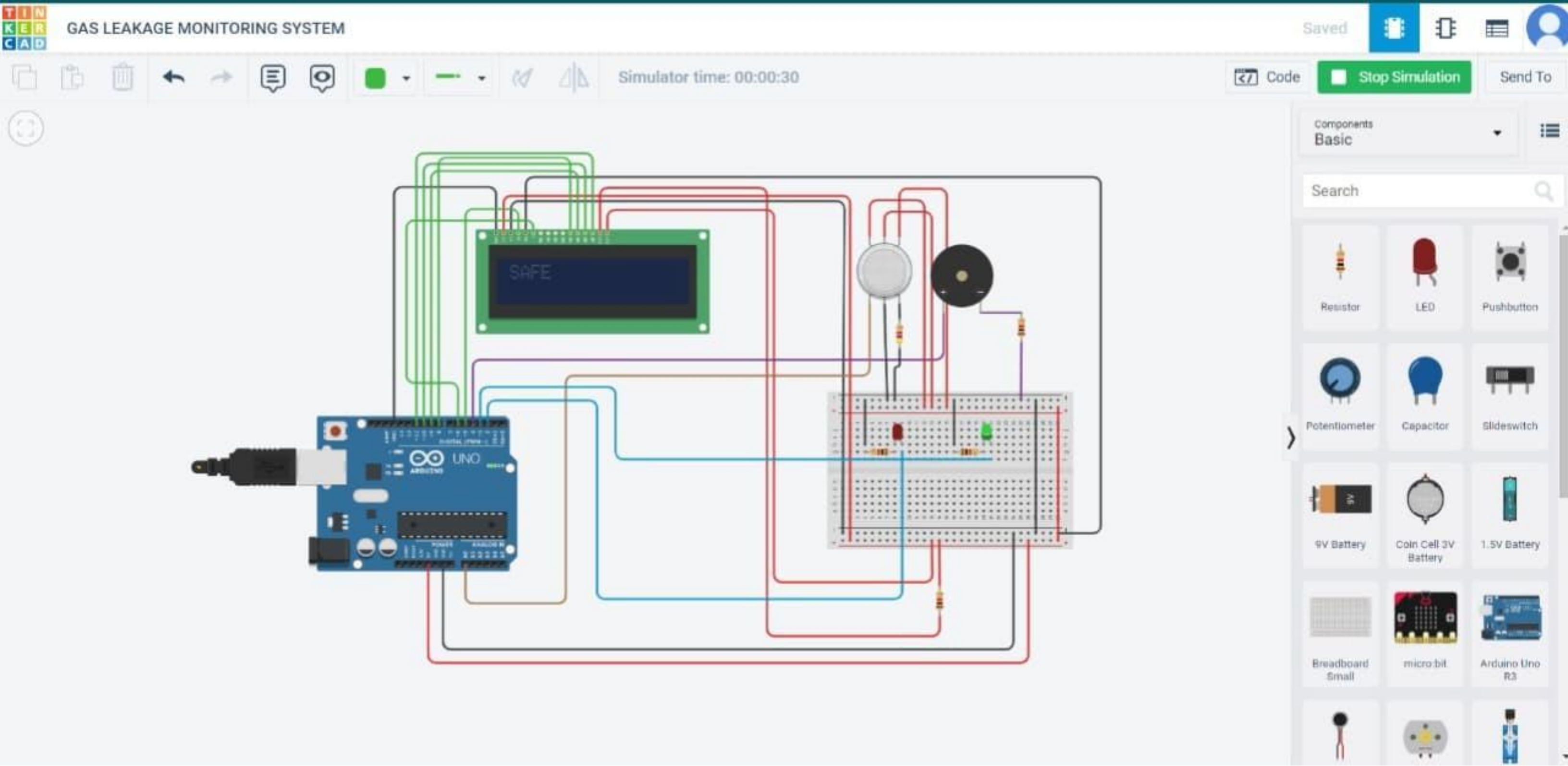
Stop Simulation
Send To
Share with people and apps
Components
Basic
Search
ALL CLEAR
UNO
Resistor
LED
Pushbutton
Potentiometer
Capacitor
Slideswitch
9V Battery
Coin Cell 3V Battery
1.5V Battery
Breadboard Small
micro:bit
Arduino Uno R3



GAS LEAKAGE MONITORING SYSTEM

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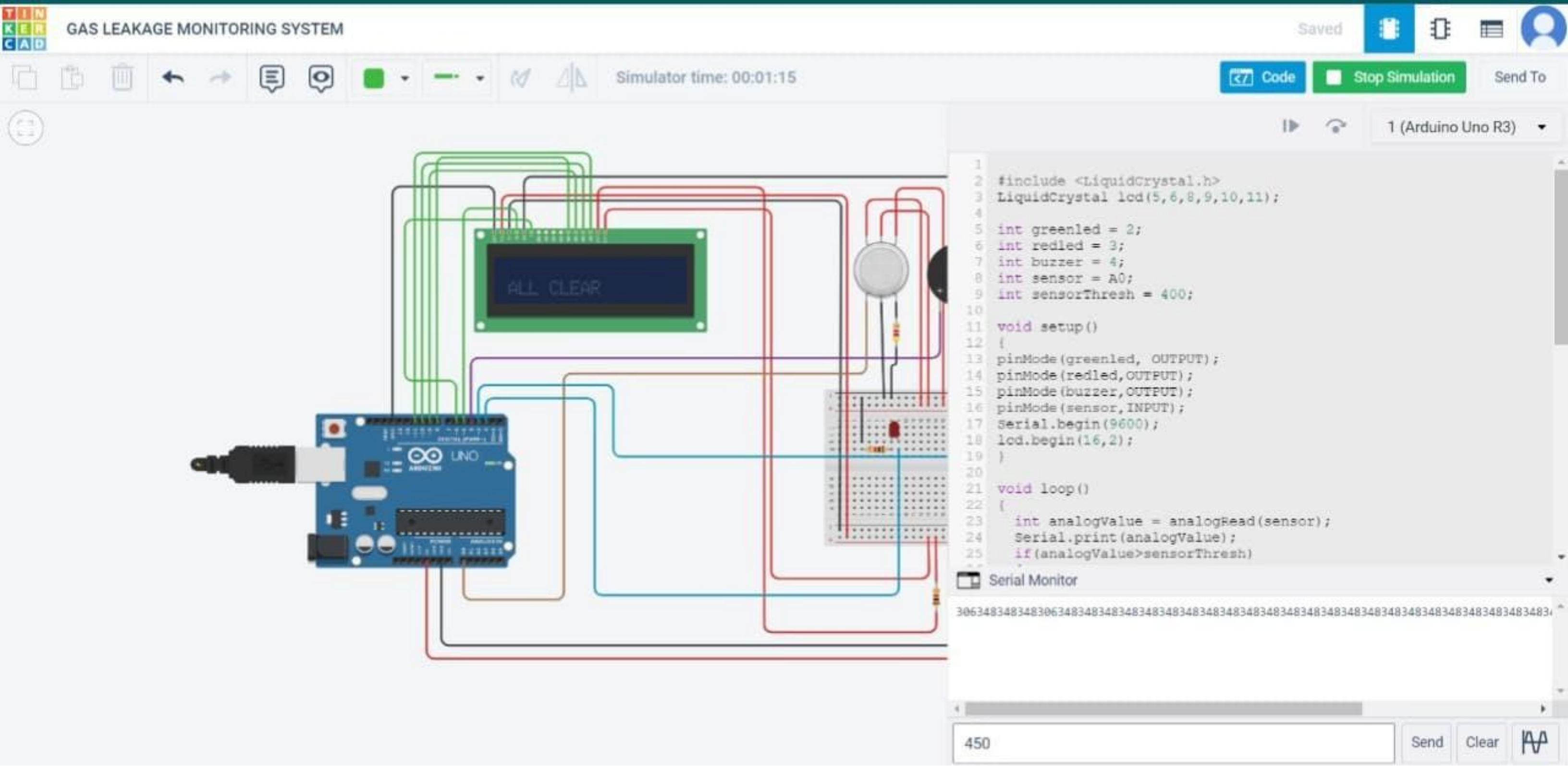
SAFE



```

#include <LiquidCrystal.h>
LiquidCrystal lcd(5,6,8,9,10,11);

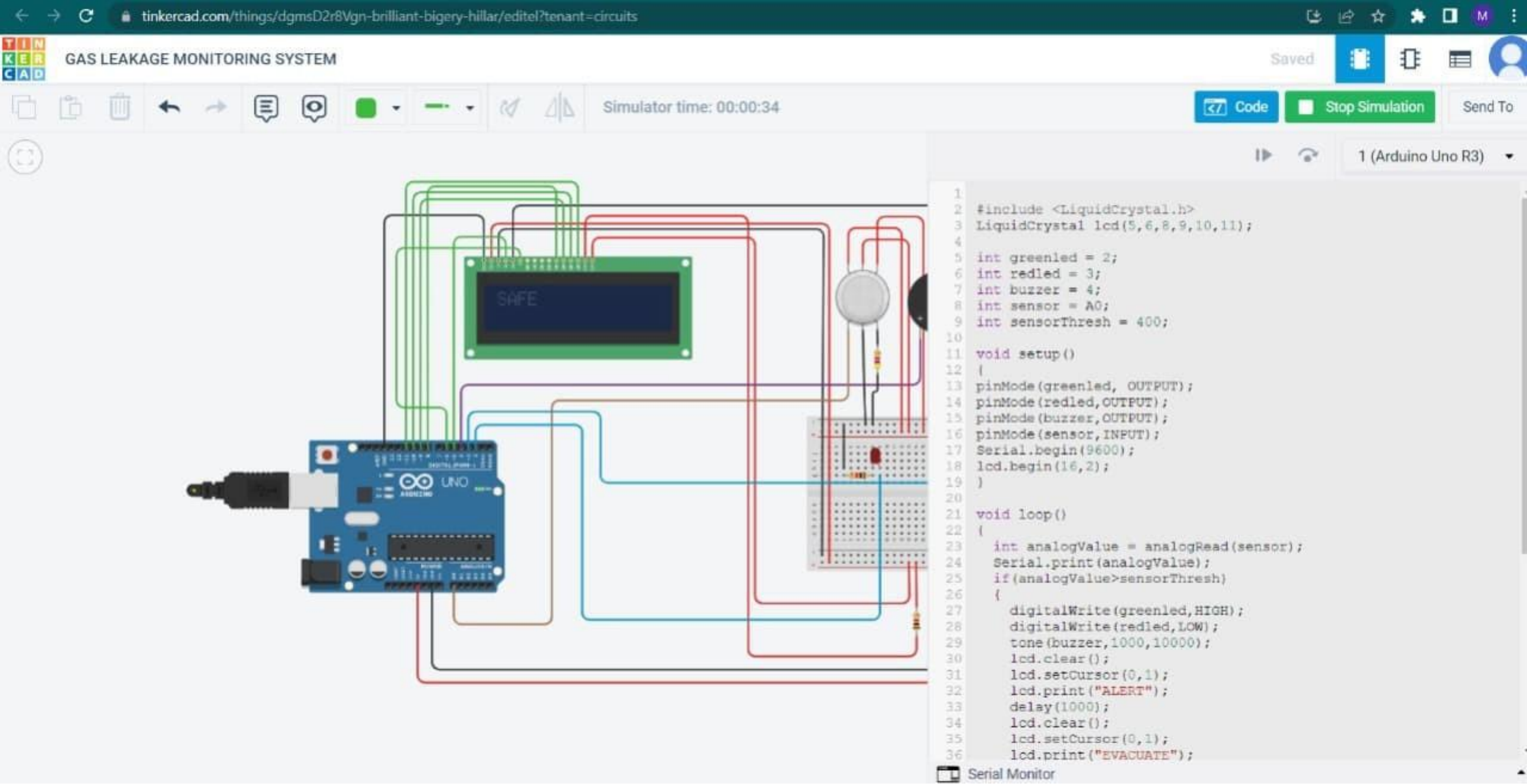
int greenled = 2;
int redled = 3;
int buzzer = 4;
int sensor = A0;
int sensorThresh = 400;

void setup()
{
pinMode(greenled, OUTPUT);
pinMode(redled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
}

void loop()
{
  int analogValue = analogRead(sensor);
  Serial.print(analogValue);
  if(analogValue>sensorThresh)
```

```
3063483483483063483483483483483483483483483483483483483483483483483483483483483483483483483483483483
```

```
450
```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GAS LEAKAGE MONITORING SYSTEM
Saved
Simulator time: 00:00:34
Code
Stop Simulation
Send To
1 (Arduino Uno R3)
SAFE
UNO
Serial Monitor

```

#include <LiquidCrystal.h>
LiquidCrystal lcd(5,6,8,9,10,11);

int greenled = 2;
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int buzzer = 4;
int sensor = A0;
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  if(analogValue>sensorThresh)
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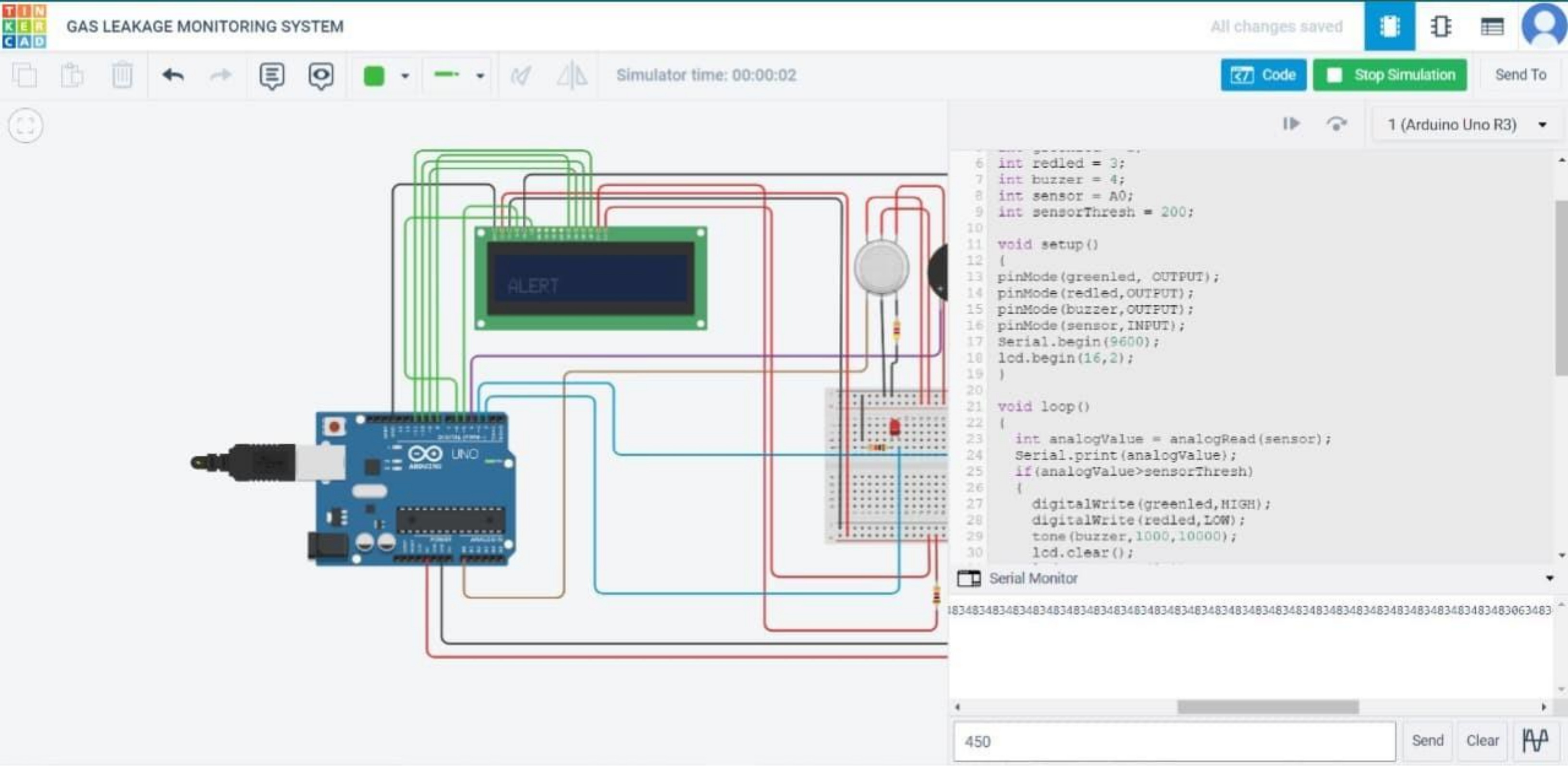
    digitalWrite(greenled,HIGH);
    digitalWrite(redled,LOW);
    tone(buzzer,1000,10000);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("ALERT");
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("EVACUATE");
```



```
int redled = 3;
int buzzer = 4;
int sensor = A0;
int sensorThresh = 200;

void setup()
{
pinMode(greenled, OUTPUT);
pinMode(redled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
}

void loop()
{
  int analogValue = analogRead(sensor);
  Serial.print(analogValue);
  if(analogValue>sensorThresh)
  {
    digitalWrite(greenled,HIGH);
    digitalWrite(redled,LOW);
    tone(buzzer,1000,10000);
    lcd.clear();
```

```
183483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483483063483
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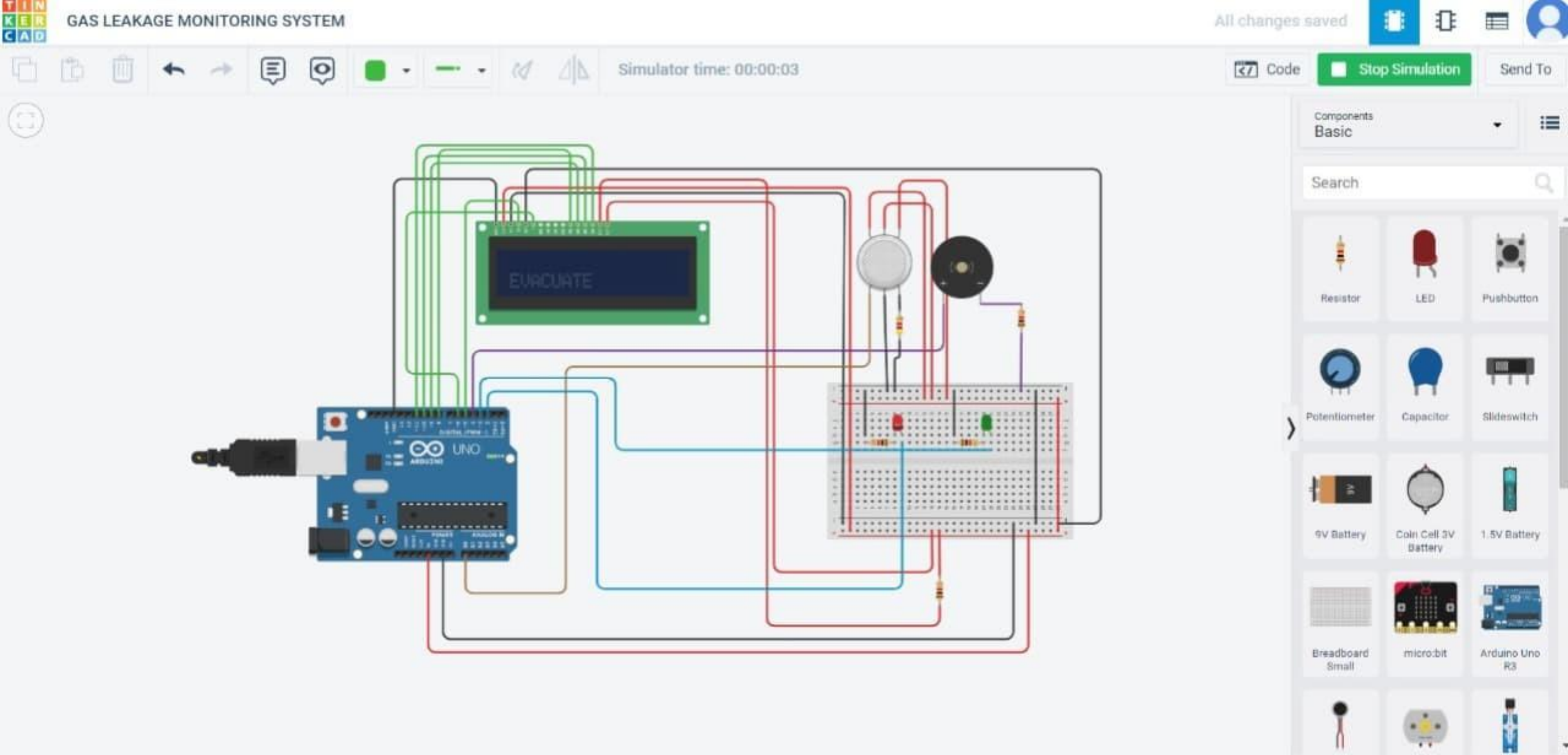
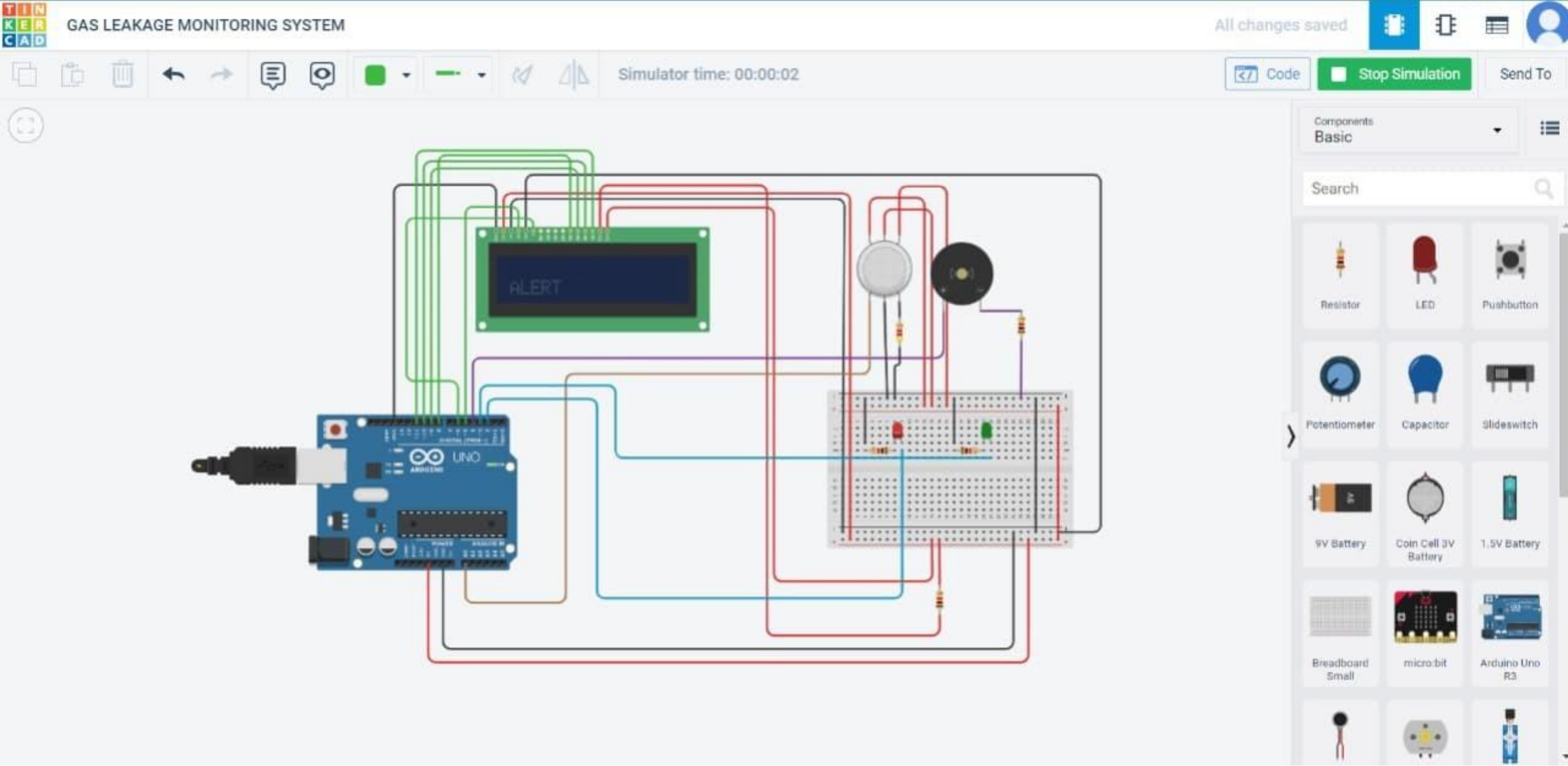
450


TIN
KER
CAD
GAS LEAKAGE MONITORING SYSTEM
All changes saved
Simulator time: 00:00:03
Code
Stop Simulation
Send To
EVACUATE
UNO
ARDUINO
Components
Basic
Search
Resistor
LED
Pushbutton
Potentiometer
Capacitor
Slideswitch
9V Battery
Coin Cell 3V Battery
1.5V Battery
Breadboard Small
micro:bit
Arduino Uno R3



GAS LEAKAGE MONITORING SYSTEM

Simulator time: 00:00:02