**Reg.no:421221121026**

**AIR QUALITY MONITORING**

#include "MQ135.h"

#include <SoftwareSerial.h>

#define DEBUG true

SoftwareSerial esp8266(9,10); // This makes pin 9 of Arduino as RX pin and pin 10 of Arduino

as the TX pin

const int sensorPin= 0;

int air\_quality;

#include <LiquidCrystal.h>

LiquidCrystal lcd(12,11, 5, 4, 3, 2);

void setup() {

pinMode(8, OUTPUT);

lcd.begin(16,2);

lcd.setCursor (0,0);

lcd.print ("circuitdigest ");

lcd.setCursor (0,1);

lcd.print ("Sensor Warming ");

delay(1000);

Serial.begin(115200);

esp8266.begin(115200); // your esp's baud rate might be different

sendData("AT+RST\r\n",2000,DEBUG); // reset module

sendData("AT+CWMODE=2\r\n",1000,DEBUG); // configure as access point

sendData("AT+CIFSR\r\n",1000,DEBUG); // get ip address

sendData("AT+CIPMUair\_quality=1\r\n",1000,DEBUG); // configure for multiple

connections

sendData("AT+CIPSERVER=1,80\r\n",1000,DEBUG); // turn on server on port 80

pinMode(sensorPin, INPUT); //Gas sensor will be an input to the arduino

lcd.clear();

}

void loop() {

MQ135 gasSensor = MQ135(A0);

float air\_quality = gasSensor.getPPM();

if(esp8266.available()) // check if the esp is sending a message

{

if(esp8266.find("+IPD,"))

{

delay(1000);

int connectionId = esp8266.read()-48; /\* We are subtracting 48 from the output because

the read() function returns the ASCII decimal value and the first decimal number which is 0

starts at 48\*/

String webpage = "<h1>IOT Air Pollution Monitoring System</h1>";

webpage += "<p><h2>";

webpage+= " Air Quality is ";

webpage+= air\_quality;

webpage+=" PPM";

webpage += "<p>";

if (air\_quality<=1000)

{

webpage+= "Fresh Air";

}

else if(air\_quality<=2000 && air\_quality>=1000)

{

webpage+= "Poor Air";

}

else if (air\_quality>=2000 )

{

webpage+= "Danger! Move to Fresh Air";

}

webpage += "</h2></p></body>";

String cipSend = "AT+CIPSEND=";

cipSend += connectionId;

cipSend += ",";

cipSend +=webpage.length();

cipSend +="\r\n";

sendData(cipSend,1000,DEBUG);

sendData(webpage,1000,DEBUG);

cipSend = "AT+CIPSEND=";

cipSend += connectionId;

cipSend += ",";

cipSend +=webpage.length();

cipSend +="\r\n";

String closeCommand = "AT+CIPCLOSE=";

closeCommand+=connectionId; // append connection id

closeCommand+="\r\n";

sendData(closeCommand,3000,DEBUG);

}

}

lcd.setCursor (0, 0);

lcd.print ("Air Quality is ");

lcd.print (air\_quality);

lcd.print (" PPM ");

lcd.setCursor (0,1);

if (air\_quality<=1000)

{

lcd.print("Fresh Air");

digitalWrite(8, LOW);

}

else if( air\_quality>=1000 && air\_quality<=2000 )

{

lcd.print("Poor Air, Open Windows");

digitalWrite(8, HIGH );

}

else if (air\_quality>=2000 )

{

lcd.print("Danger! Move to Fresh Air");

digitalWrite(8, HIGH); // turn the LED on

}

lcd.scrollDisplayLeft();

delay(1000);

}

String sendData(String command, const int timeout, boolean debug)

{

String response = "";

esp8266.print(command); // send the read character to the esp8266

long int time = millis();

while( (time+timeout) > millis())

{

while(esp8266.available())

{

// The esp has data so display its output to the serial window

char c = esp8266.read(); // read the next character.

response+=c;

}

}

if(debug)

{

Serial.print(response);

}

return response;

}