

Arduino Code

For CO₂ detection in air

```
#include "MQ135.h"
#include <Wire.h>
#include <LiquidCrystal_I2C.h> //Header file for LCD

LiquidCrystal_I2C lcd(0x27,16,2);//set the LCD address to x27 for a 16 chars
and 2 line display

#define led          9                //led on pin 9

const int gas_pin = A0;
MQ135 gasSensor = MQ135(gas_pin);
void setup(){

    lcd.init();                      // initialize the lcd
    lcd.begin(16,2);
    lcd.backlight();
    lcd.clear();
    lcd.setCursor(4,0);
    lcd.print("Group L");

    pinMode(gas_pin,INPUT); //MQ135 analog feed set for input
    pinMode(led,OUTPUT);    //led set for output
    Serial.begin(9600);
}

void loop(){
    float ppm = gasSensor.getPPM();
    Serial.println(ppm);
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,0);              // set cursor of lcd to 1st row and 3rd
column
    lcd.print("Air Quality: "); // print message on lcd
    lcd.print(ppm);                 // print value of MQ135
    if(ppm>999){                     //if co2 ppm > 1000
        digitalWrite(led,HIGH); //turn on led
        lcd.setCursor(2,1);        // set cursor of lcd to 2nd row and 3rd
column
        lcd.print("AQ Level BAD");
    }
    else{
        digitalWrite(led,LOW);      //turn off led
        lcd.setCursor(1,1);         // set cursor of lcd to 2nd row and 2nd
column
        lcd.print ("AQ Level Good");
    }
}
```

```
}  
  
}
```

For noise disturbance detection in the environment

```
/* This code allows to follow the sound intensity using LM393 sensor: The  
number of times the sensor has detected a sound is summed up over a sampling  
time  
SAMPLE_TIME. Then the sum (sampleBufferValue) is printed on serial monitor  
A led is used to give a visual alarm if the sampleBufferValue  
surpasses a given Threshold: Threshold*/  
// 0 means silence and 1 means noise  
const int OUT_PIN = 12; // The OUTPUT of the sound sensor is connected to  
the digital pin D12 of the Arduino  
const int SAMPLE_TIME = 10; // The sampling time  
const int Threshold = 100; // Threshold on cumulative counts for LED  
switching ON  
unsigned long millisCurrent;  
unsigned long millisLast = 0;  
unsigned long millisElapsed = 0;  
int sampleBufferValue = 0;  
  
int led = 8; // LED is connected to the digital pin number 4 of the Arduino  
  
void setup() {  
  // put your setup code here, to run once:  
  Serial.begin(9600);  
  pinMode(led,OUTPUT); // the LED is connected as output  
}  
  
void loop() { // put your main code here, to run repeatedly:  
  
  millisCurrent = millis();  
  millisElapsed = millisCurrent - millisLast;  
  if(digitalRead(OUT_PIN) == HIGH){ // HIGH means noise  
    sampleBufferValue++;  
  }  
  if (millisElapsed > SAMPLE_TIME) { //here we will print the counts and  
test the threshold  
    Serial.println(sampleBufferValue);  
    if (sampleBufferValue > Threshold) {  
      digitalWrite(led, HIGH); //blink LED 2 ms ON and 1 ms OFF  
      delay(2);  
      digitalWrite(led, LOW);  
      delay(1);  
    }  
    digitalWrite(led, LOW);  
    sampleBufferValue = 0;  
    millisLast = millisCurrent;
```

```
}  
}
```

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