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Air Contaminant Sensor TGS 2600

Introduction:

The sensing element is comprised of a metal oxide semiconductor layer formed on an alumina substrate of a sensing chip together with an integrated heater. In the presence of a detectable gas, the sensor's conductivity increases depending on the gas concentration in the air. A simple electrical circuit can convert the change in conductivity to an output signal which corresponds to the gas concentration.

The TGS 2600 has high sensitivity to low concentrations of gaseous air contaminants such as hydrogen and carbon monoxide which exist in cigarette smoke. The sensor can detect hydrogen at a level of several ppm. Figaro also offers a microprocessor (FIC02667) which contains special software for handling the sensor's signal for appliance control applications.

Due to miniaturization of the sensing chip, TGS 2600 requires a heater current of only 42mA and the device is housed in a standard TO-5 package.

Components:

- Arduino Uno Board
- Air Contaminant Sensor TGS 2600
- 1k ohm resistor
- Breadboard
- Several Jumper Wires

Objectives:

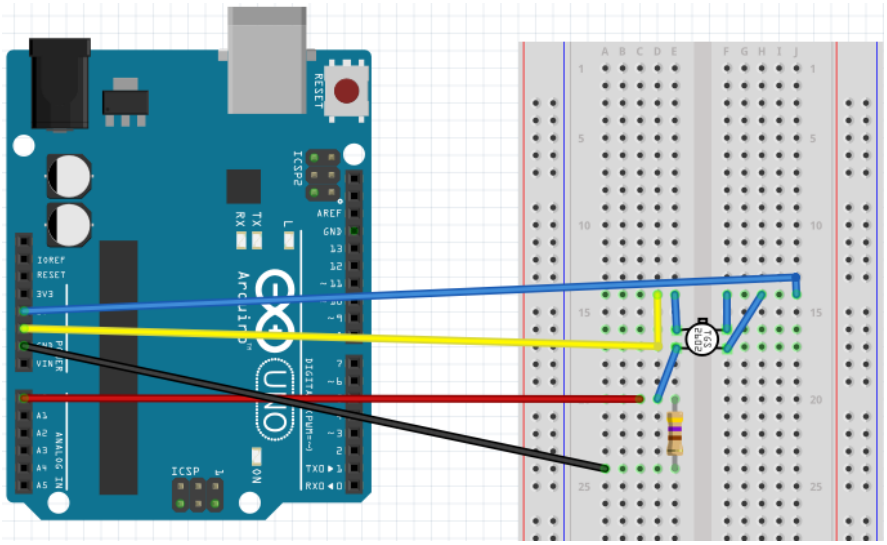
1. To detect the contaminant in the air.

Procedures:

Step 1: Build the circuit.

- The connection between the Air Contaminant Sensor TGS 2600 and the Arduino Uno Board:

Air Contaminant Sensor TGS 2600	Arduino Uno
Pin 1: Heater	**5V**
Pin 2: Sensor electrode (-)	**5V**
Pin 3: Sensor electrode (+)	**A0**
Pin 4: Heater	**GND**



Step 2: Insert the sample programming provided below by copy and paste it into Arduino IDE.

```
// Gas Sensor Variables
int gasSensor = A0;
int gasVal = 0;
```

```
int badVal = 10;
int interval = 1000;

// Flipdot Variables
int flip = 11;
int flop = 10;

// Initialize Motor
#define DIR_PIN 2
#define STEP_PIN 3

void setup() {
  Serial.begin(9600);

  pinMode(flip,OUTPUT);
  pinMode(flop,OUTPUT);

  pinMode(DIR_PIN, OUTPUT);
  pinMode(STEP_PIN, OUTPUT);

  dotBlack();
}

void loop() {
  gasVal = analogRead(gasSensor);
  Serial.println(gasVal);

  if (gasVal >= badVal) {
    dotRed();

    rotate(1000, .5);
    delay(10);
    rotate(0, .25); //reverse
    delay(10);
  }
  else {
    dotBlack();
  }
```

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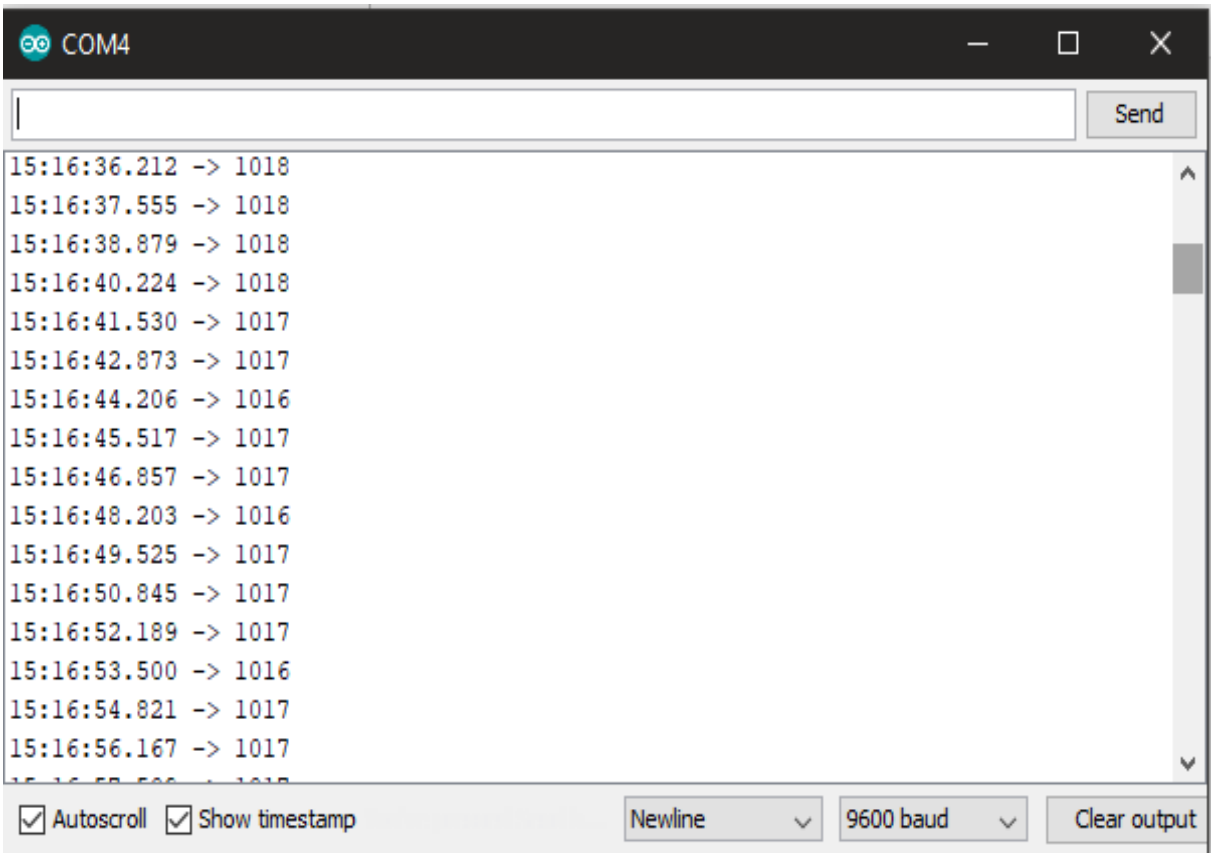
```
  // Check every second
  delay(interval);
}

void dotRed() {
  digitalWrite(flip,HIGH);
  digitalWrite(flop,LOW);
  delay(20);
  digitalWrite(flip,LOW);

}
void dotBlack() {
  digitalWrite(flip,LOW);
  digitalWrite(flop,HIGH);
  delay(20);
  digitalWrite(flop,LOW);
}
void rotate(int steps, float speed){
  //rotate a specific number of microsteps (8 microsteps per step) - (negitive for reverse movement)
  //speed is any number from .01 -> 1 with 1 being fastest - Slower is stronger
  int dir = (steps > 0)? HIGH:LOW;
  steps = abs(steps);

  digitalWrite(DIR_PIN,dir);

  float usDelay = (1/speed) * 70;

  for(int i=0; i < steps; i++){
    digitalWrite(STEP_PIN, HIGH);
    delayMicroseconds(usDelay);

    digitalWrite(STEP_PIN, LOW);
    delayMicroseconds(usDelay);
  }
}
```

Step 3: Open the serial monitor to observe the result as shown below.



Conclusion:

The value increases as the heat increase