

Parallax C2H5OH Gas Sensor Module (#27904) Arduino Demo

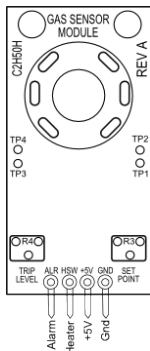


Please Note: This product is discontinued. This demo was created to support the 2013 National microMedic Contest kits, which are no longer available.

The C2H5OH Gas Sensor Module, fitted with an alcohol/benzene sensing element, allows for the electronic detection of C2H5OH concentration present in the air. The board provides a simple LOW/HIGH alarm output, where HIGH indicates that the preset gas level has been reached or exceeded. This demo connects the sensor module to the Board of Education Shield and displays output in the Arduino Serial Monitor.

Gas detector elements routinely incorporate their own heating elements that must be activated before sensing can take place. The Gas Sensor Module provides a convenient means to control the heater contained inside the gas detector element.

This how-to is written for the C2H5OH Parallax Gas Sensor Module. You can identify this board by the text Gas Sensor Module along the top of the PCB. This demo is NOT compatible for use with the Gas Sensor Board (#27983) and C2H5OH Gas Sensor (#605-00011).



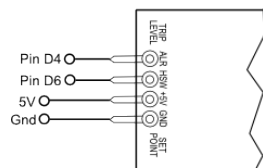
WARNING: Experimenting with gas sensors may involve exposure to noxious and potentially dangerous fumes. Exercise extreme caution when testing these sensors.

Calibration

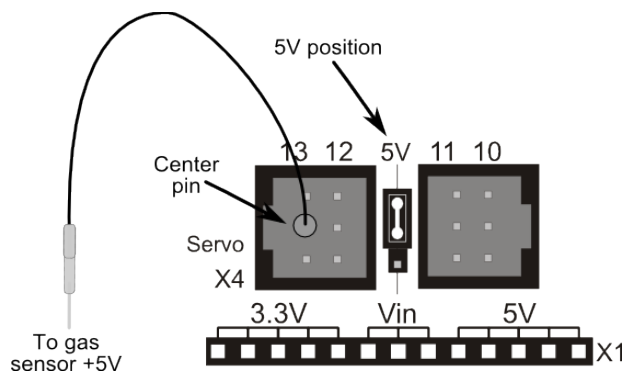
Prior to using the Gas Sensor Module, it is necessary to calibrate the board to set its trip level and set point. Details for this procedure are outlined in the documentation for the Gas Sensor Module, so it will not be repeated here. But in general, the process involves powering the board and heater for a period of at least several minutes, then using a multi-meter to adjust both the Trip and Set points to 0.8 volts.

Connections

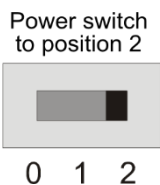
The USB port on your computer may not be able to provide sufficient current to operate the heater of the gas element. To provide adequate current, power the Arduino and BOE Shield using a 7-12 volt DC wall adapter rated at 500 mA or higher.



To connect the Gas Sensor Module to the Arduino Shield, attach its leads as shown in the figure. Note the special connection of the +5V power lead to the BOE Shield.



Set the switch on the bottom of the BOE Shield to the #2 position. This connects power to the servo headers, so that the Gas Sensor Module is powered from the external supply, rather than from the USB port.



Programming

To use this example, upload the following sketch to your Arduino, then open the Serial Monitor window. Ensure that the Baud Rate is set at 9600. The C2H5OH sensor goes through a special “purge” cycle that lasts 60 seconds. After this period, it reads the Alarm output during a “sense” period once every second, for 90 seconds. The sketch demonstrates going through one purge/sense cycle before ending.

During the sense period the Alarm output will go HIGH for as long as the element continues to read the elevated presence of alcohol/benzene gas. When triggered (gas level at or above preset), the Serial Monitor window will display the word ALARM.

```
int sense = 4;
int heater = 6;

void setup() {
  Serial.begin(9600);
  pinMode(heater, OUTPUT);
  pinMode(sense, INPUT);
  digitalWrite(heater, LOW); // Heater on (note inverted logic)
  Serial.println("Purge started...");
  for(int i = 60; i > 0; i--) { // Purge for 60 seconds
    Serial.println(i);
    delay(1000);
  }
  Serial.println("Purge completed...");

  Serial.println("Sensing...");

  for(int i = 0; i <= 90; i++) { // Read for 90 seconds
    Serial.print(i, DEC); // This code may be repeated
    if(digitalRead(sense) == 1)
      Serial.print(" ALARM");
    Serial.println("");
    delay(1000);
  }
  Serial.println("Sense complete...");
}

void loop() {
  // Empty loop
}
```