Web Site: www.parallax.com
Forums: forums.parallax.com
Sales: sales@parallax.com
Technical: support@parallax.com

Office: (916) 624-8333
Fax: (916) 624-8003
Sales: (888) 512-1024
Tech Support: (888) 997-8267

Parallax Gas Sensor Board (#27983) with CH4 Sensor (#605-00008) Arduino Demo

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

The Gas Sensor Board, fitted with a CH4 Gas Sensor, allows for the electronic detection of methane concentration present in the air. The board provides a simple LOW/HIGH alarm output, where HIGH indicates that the preset methane gas level has been reached or exceeded. This demo connects the Gas Sensor Board to the Board of Education Shield and outputs sensor status to the Arduino Serial Monitor.

Gas sensors routinely incorporate their own heating elements that must be activated before sensing can take place. The Gas Sensor Board provides a convenient means to control the heater contained inside the CH4 Gas Sensor.

This demo is written for Rev A of the Parallax Gas Sensor Board, which is sold individually as #27983. You can identify this board by the text "Gas Sensor Board" along the top of the PCB. Previous versions of some Parallax gas sensing products used the name Gas Sensor Module, and each was specific to the type of detector it was made for, such as CO (carbon monoxide) and CH4 (methane). This how-to is NOT applicable to these earlier boards.


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 Board, 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 Board, 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.
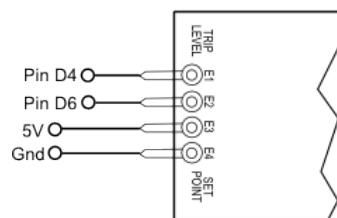
To connect the Gas Sensor Board to the Arduino Shield, attach its leads as shown in the figure. Note the special connection of the +5V power lead to the Board of Education Shield.
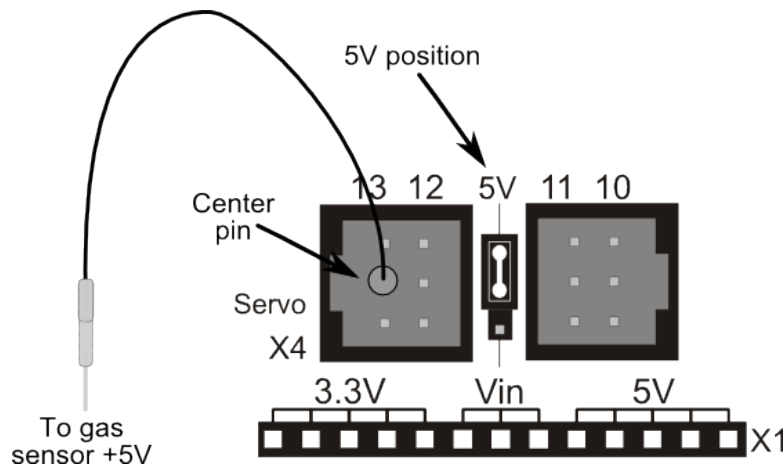
Set the switch on the bottom of the BOE Shield to the #2 position. This connects power to the servo headers, so that the Gas Sensor Board is powered from the external supply, rather than from the USB port.

Power switch
to position 2

0 1 2

Programming

Upload the following sketch to your Arduino then open the Serial Monitor window. Ensure that the Baud Rate is set at 9600. The CH4 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. This sequence of purge/sense then repeats over again.

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

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

void setup() {
  Serial.begin(9600);
  pinMode(heater, OUTPUT);
  pinMode(sense, INPUT);
  digitalWrite(heater, HIGH);        // Heater on
  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
}
```