# KEYES ARDUINO Linear Hall magnetic module

Chances are your sensor does not look like the one I used. Regardless, if your sensor is analog the code should work for yours as well, although your setup will be different. If your sensor has three pins on it I suggest trying out catch all sensor guides first.

This sensor is used to detect magnetic fields. The current, and thus the voltage, running through the sensor is changed in relation to the presence of a magnetic field. This sensor is designed so it can tell you the amount the voltage has changed as an analog output, and if the voltage has changed as a digital output. Since the sensor can provide digital and analog outputs, there is a surprising amount you can do with it. You can easily make a working sensor, or make a much more complicated one.

This sensor is built in such a way that the sensor itself has everything needed to operate, including an LED. The as such, you can get a basic magnetic switch with nothing more than a 5v battery by connecting the magnet ports to the + and G pins. When a magnet is brought close to the sensor, the voltage will change and send a signal to the sensors integrated LED, telling it to light up. This is as simple as this sensor comes. We would like to do something a bit more complicated though.

Setup your sensor as in the following picture.
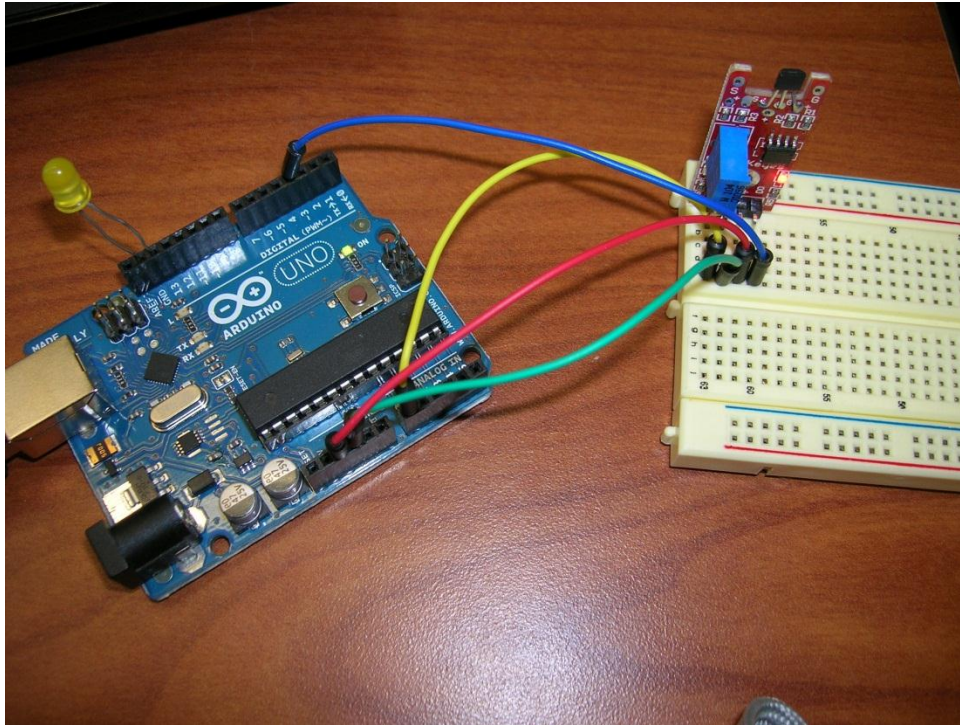


The yellow wire is connected to A0 on the sensor, and A0 on the Arduino. The green wire is connected to G on the sensor and GND on the Arduino. The Red wire is connected to + on the sensor and 5V on the Arduino. The blue wire is connected to D0 on the sensor and Digital 3 on the Arduino. The LED has it's long prong in DIGITAL 13 and its short pin in GND.

Download the following code.

//TMP36 Pin Variables

int sensorPin = 0; //Says we are working with a sensor in analog pin 0

 int LED = 13; //defines LED pin

 int buttonpin= 3; //says we are look at digtial 3 as well

 int val;

 /*

 * setup() - this function runs once when you turn your Arduino on

 * We initialize the serial connection with the computer

```arduino
  */

void setup()

{

  pinMode (LED, OUTPUT); //define LED as output interface

  pinMode (buttonpin, INPUT); //defines digital pin 3 as input for LED

  Serial.begin(9600);  //Start the serial connection with the computer

            //to view the result open the serial monitor

}


void loop()              // run over and over again

{

//getting the voltage reading from the temperature sensor

 int reading = analogRead(sensorPin);


// converting that reading to voltage, for 3.3v arduino use 3.3

 float voltage = reading * 5.0;

 voltage /= 1024.0;


// print out the voltage to the serial monitor

 Serial.print(voltage); Serial.println(" volts");

 val = digitalRead (buttonpin); //read the data from the digital pin

 if (val==HIGH) //when the sensor detects a magnetic field

 {digitalWrite (LED, HIGH);

 }

 else

 {digitalWrite (LED, LOW);

 }


 delay(100);                     //waiting a second
```

}

This code tells the sensor to do two things. First, it tells it to send the analog reading of voltage to the Arduino. As a magnet field gets stronger, the voltage will change. This voltage will change up or down depending on which side of the magnet it is detecting (north or south).

Second, the sensor acts as a switch for the LED. If the magnetic field gets stronger it will switch the LED on. The downside is that the sensor is polarized and it can only have 2 states (on or off), so it can only detect one pole of the magnetic field. The other orientation will just turn the switch more off. As such, the LED will not light up with certain orientations of the magnet.

The sensor also includes a variable resistor which can be used to adjust the sensors sensitivity. The resistor does not do a whole lot though, so don't bother messing with it too much.