HMC5883L 3-Axis Digital Compass Quickstart Guide

The HMC5883L 3 – Axis Digital Compass Magnetometer Board senses magnetism. This magnetometer can be used in simple applications, such as a digital compass, or detecting ferrous objects such as iron. Use this together with the GPS system for accurate tracking and monitoring of your device.

HARDWARE SPECIFICATIONS

- 3-Axis Magnetometer
- Voltage Supply: 5V
- I^2C Digital Interface
- 1°-2° compass heading accuracy

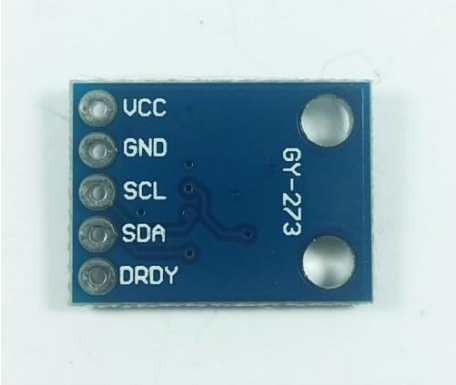
PARTS LIST

For this quickstart guide, we will need the following materials:

- 1 – Arduino Uno: https://www.bitstoc.com/product/1/
- Connecting wires : https://www.bitstoc.com/product/107/
- 1 – HMC5883L 3-axis digital compass

HARDWARE OVERVIEW

The 1 channel relay have 3 pins to be connected to the microcontroller: VCC, GND and IN. For the system to be controlled, the pins NO, COM and NC are used.

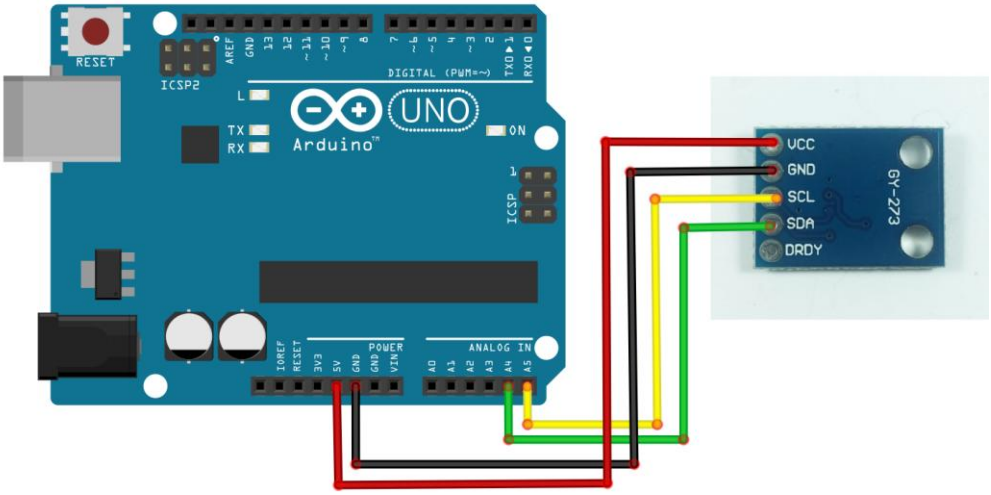


The table below describes the function of each pin in the module

INPUT	Description
GND	To be connected to the GND pin in a microcontroller.
VCC	Supplies power to the module. Could be connected to a +5V pin or +3.3V pin.
OUTPUT	
SCL	I^2C Serial Pins. Used in communicating to microcontrollers such as Arduino.
SDA	

WIRING CONNECTION

Setup the circuit as shown below:



ARDUINO CODE

Open Arduino IDE. Set the board to Arduino/Genuino Uno. Copy the code below to the programmer:

```
#include <Wire.h> //I2C Arduino Library
#define addr 0x1E //I2C Address for The HMC5883

void setup(){

  Serial.begin(9600);
  Serial.print("HMC5833L COMPASS SENSOR BEGIN");
  Serial.println();
  Wire.begin();


  Wire.beginTransmission(addr); //start talking
  Wire.write(0x02); // Set the Register
  Wire.write(0x00); // Tell the HMC5883 to Continuously Measure
  Wire.endTransmission();
}


void loop(){

  int x,y,z; //triple axis data

  //Tell the HMC what regist to begin writing data into
  Wire.beginTransmission(addr);
  Wire.write(0x03); //start with register 3.
  Wire.endTransmission();

 //Read the data.. 2 bytes for each axis.. 6 total bytes
  Wire.requestFrom(addr, 6);
  if(6<=Wire.available()){
    x = Wire.read()<<8; //MSB  x
    x |= Wire.read(); //LSB  x
    z = Wire.read()<<8; //MSB  z
    z |= Wire.read(); //LSB z
    y = Wire.read()<<8; //MSB y
    y |= Wire.read(); //LSB y
  }
  // Show Values
```

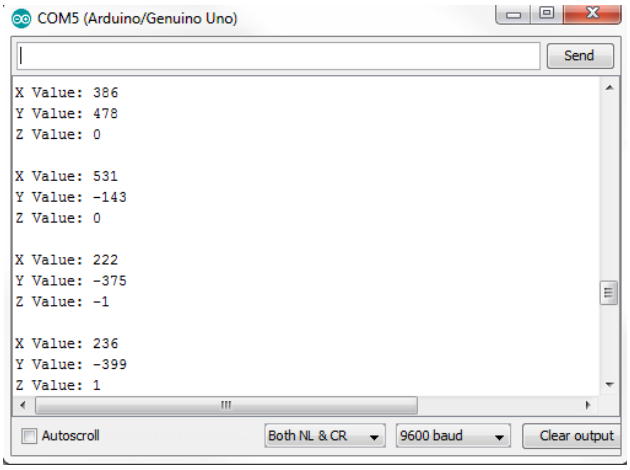
```
  Serial.print("X Value: ");
  Serial.println(x);
  Serial.print("Y Value: ");
  Serial.println(y);
  Serial.print("Z Value: ");
  Serial.println(z);
  Serial.println();

  delay(1000);
}
```

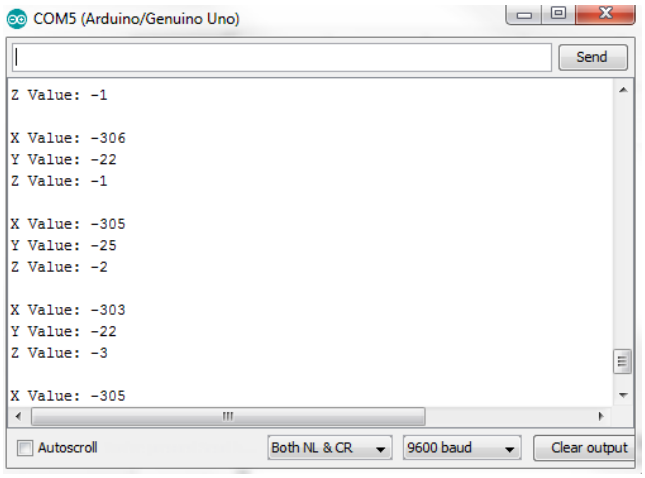
Upload the code. Open Serial Monitor and set baud rate to **"9600, BOTH NL & CR"**.

OUTPUT

When opening serial monitor, the sensor board gives an output in x,y and z values. This corresponds to a 3-dimensional coordinate in (x,y,z) format.



Board is moved or rotated



Board is stationary

APPLICATIONS

You can find more uses of this module in the sample projects below:

Arduino Digital Magnetic Compass by Arduinomotive_com:

https://www.instructables.com/id/Arduino-Digital-Magnetic-Compass-HMC5883L-2-displa/

SOURCES

https://cdn-shop.adafruit.com/datasheets/HMC5883L_3-Axis_Digital_Compass_IC.pdf