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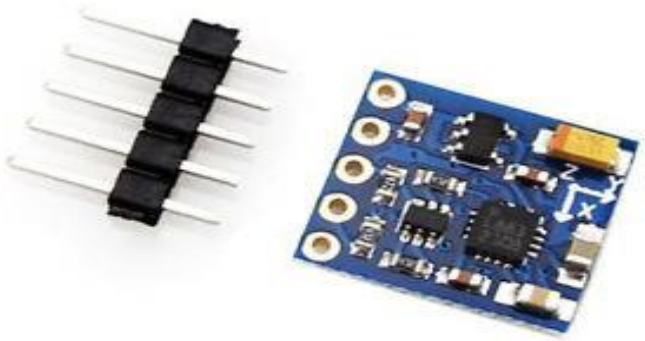
GROUP 10

GY 271 HCM5388L 3 -axis Digital Compass TUTORIAL



Description

The Compass Module is designed for low-field magnetic sensing with a digital interface and perfect to give precise heading information. This compact sensor fits into small projects such as UAVs and robot navigation systems. The sensor converts any magnetic field to a differential voltage output on 3 axes. This voltage shift is the raw digital output value, which can then be used to calculate headings or sense magnetic fields coming from different directions.

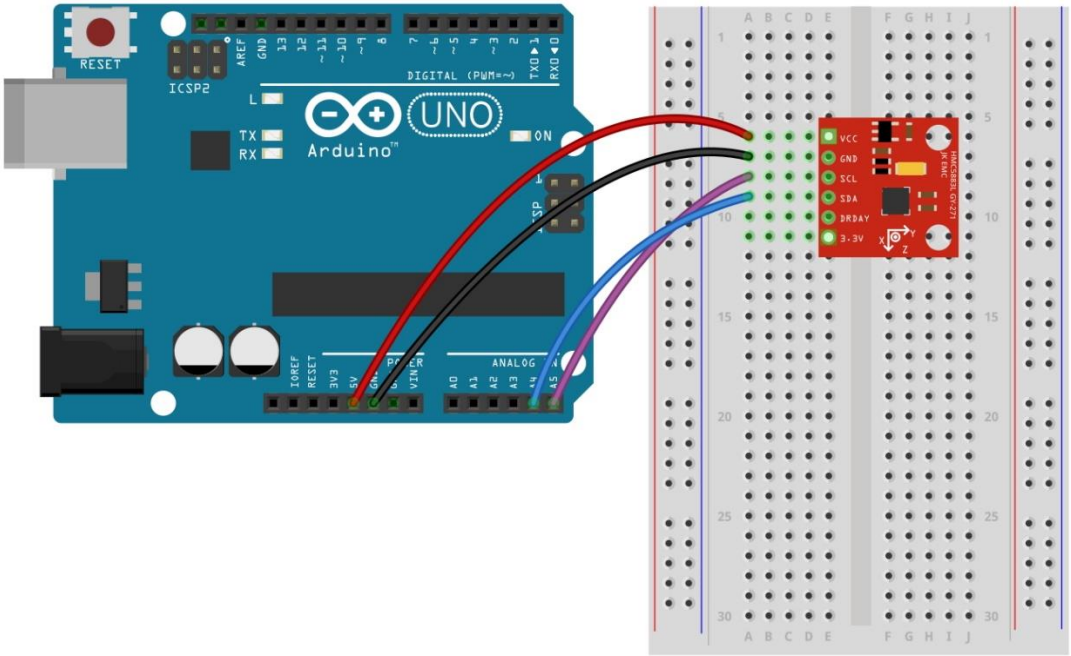
Specifications

- Power 3V-5V DC
- Chipset HMC5883L
- Communication via I2C protocol
- Measuring range: ± 1.3-8 Gauss
- Dimensions 14.8 x 13.5 x 3.5mm

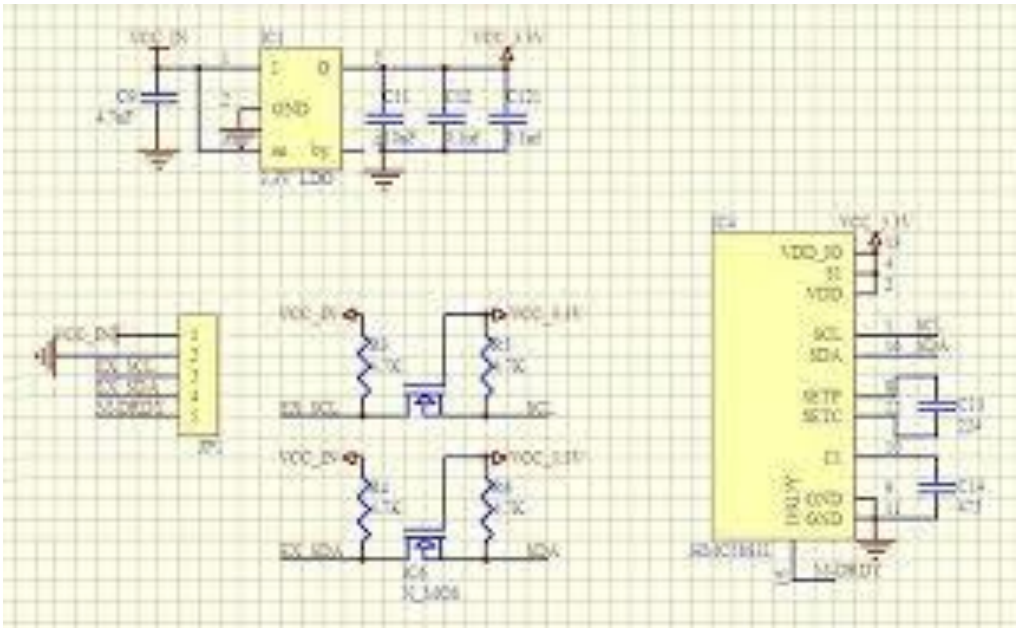
Pin Configuration

1. VCC: 3V-5V DC
2. GND: ground
3. SCL: analog input (A5)
4. SDA: analog input (A4)
5. DRDY: not connected

Wiring Diagram



Schematic Diagram



Sample Sketch

```
#include <Wire.h> //I2C Arduino Library
#define addr 0x0D //I2C Address for The HMC5883
void setup() {
 Serial.begin(9600);
  Wire.begin();
  Wire.beginTransmission(addr); //start talking
  Wire.write(0x0B); // Tell the HMC5883 to Continuously Measure
  Wire.write(0x01); // Set the Register
  Wire.endTransmission();
  Wire.beginTransmission(addr); //start talking
  Wire.write(0x09); // Tell the HMC5883 to Continuously Measure
  Wire.write(0x1D); // Set the Register
  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(0x00); //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(); //MSB  x
    x |= Wire.read() << 8; //LSB  x
    z = Wire.read(); //MSB  z
    z |= Wire.read() << 8; //LSB z
    y = Wire.read(); //MSB y
    y |= Wire.read() << 8; //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);
}
```

How to Test

The components to be used are:

- Arduino Uno (any compatible microcontroller)
- GY-271 electronic compass
- Pin connectors
- Breadboard
- USB cable

1. Connect the components based on the figure shown in the wiring diagram using pin connectors. VCC pin is connected to the 5V power supply, GND pin is connected to the GND, the SCL pin is connected to A5 pin, and the SDA pin is connected to A4 pin.

2. After hardware connection, insert the sample sketch into the Arduino IDE.

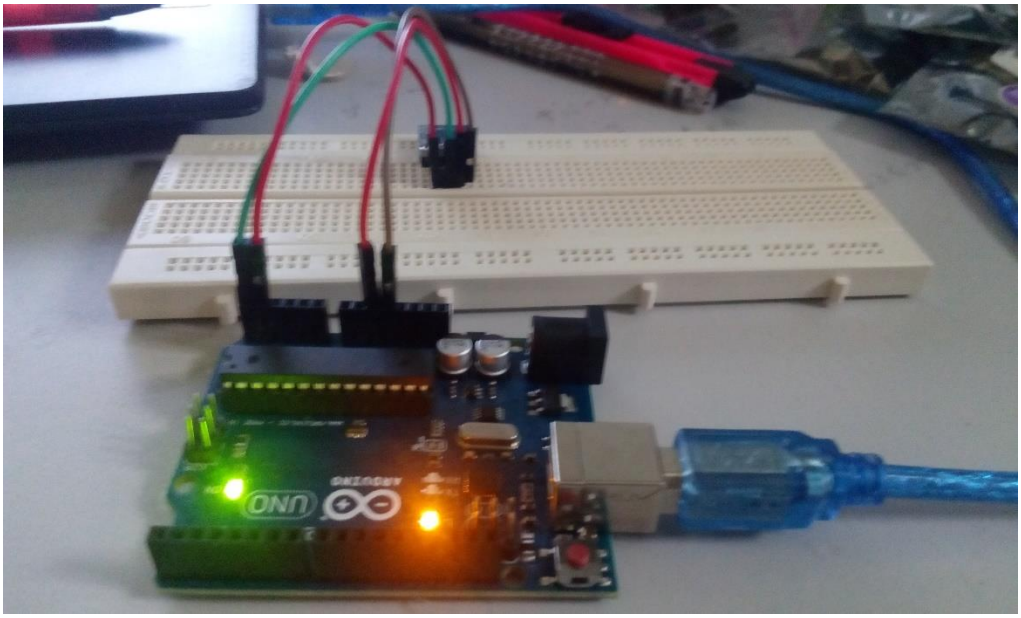
3. Download and import HMC5583L into the library.

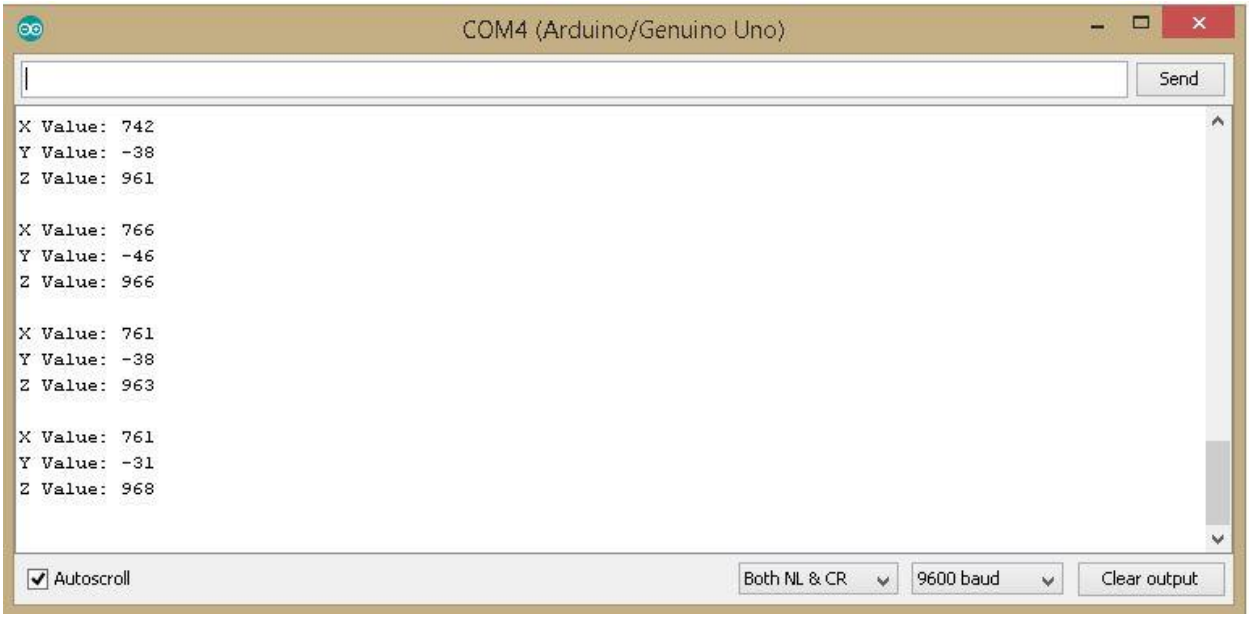
4. By using a USB cable, connect the ports from the microcontroller to the computer.

5. Upload the program.

6. See the results in the serial monitor.

Testing Results





The value is changing when you change the position of the compass.