Magnetic compass

HCMODU0036/HMC5883L

The GY-273 module is based on the Honeywell HMC5883L IC for low-field magnetic sensing with a digital interface for applications such as lowcost compassing and magnetometry. The HMC5883L includes state-of-theart, high-resolution HMC118X series magneto-resistive sensors plus an ASIC containing amplification, automatic degaussing strap drivers, offset cancellation,
and a 12-bit ADC that enables 1° to 2° compass heading accuracy. The I2C serial bus allows for easy interface.

The HMC5883L utilizes Honeywell's Anisotropic Magnetoresistive (AMR) technology that provides advantages over other
magnetic sensor technologies. These anisotropic, directional sensors feature precision in-axis sensitivity and linearity.
These sensors' solid-state construction with very low cross-axis sensitivity is designed to measure both the direction and
the magnitude of Earth's magnetic fields, from milli-gauss to 8 gauss. Honeywell's Magnetic Sensors are among the most
sensitive and reliable low-field sensors in the industry.

Specification:

HMC5883L module (three-axis magnetic field module)
Model: GY-273
IC: HMC5883L
Module Power supply : 3-5v
Communication: IIC communication protocol
Measuring range: ± 1.3-8 gauss
Size: 13.9 * 18.5

Example

```
/*

This is an example of how to use the Hobby Components GY-273 module which
uses a Honeywell HMC5883L 3-Axis Digital Compass IC. The IC uses an I2C interface
to
communicate which is compatible with the standard Arduino Wire library.

This example demonstrates how to initialise and read the module in single shot
measurement mode. It will continually trigger single measurements and output the
results for the 3 axis to the serial port.


CONNECTIONS:

MODULE    ARDUINO
VCC       3.3V
GND       GND
```

```
SCL       A5
SDA       A4
*/

/* Include the standard Wire library */
#include <Wire.h>

/* The I2C address of the module */
#define HMC5803L_Address 0x1E

/* Register address for the X Y and Z data */
#define X 3
#define Y 7
#define Z 5

void setup()
{
  Serial.begin(9600);
  /* Initialise the Wire library */
  Wire.begin();

  /* Initialise the module */
  Init_HMC5803L();
}

void loop()
{
  /* Read each sensor axis data and output to the serial port */
  Serial.print(HMC5803L_Read(X));
  Serial.print(" ");
  Serial.print(HMC5803L_Read(Y));
  Serial.print(" ");
  Serial.println(HMC5803L_Read(Z));

  /* Wait a little before reading again */
  delay(200);
}


/* This function will initialise the module and only needs to be run once
   after the module is first powered up or reset */
void Init_HMC5803L(void)
{
  /* Set the module to 8x averaging and 15Hz measurement rate */
  Wire.beginTransmission(HMC5803L_Address);
  Wire.write(0x00);
  Wire.write(0x70);

  /* Set a gain of 5 */
  Wire.write(0x01);
  Wire.write(0xA0);
  Wire.endTransmission();
}


/* This function will read once from one of the 3 axis data registers
and return the 16 bit signed result. */
int HMC5803L_Read(byte Axis)
{
```

```
  int Result;

  /* Initiate a single measurement */
  Wire.beginTransmission(HMC5803L_Address);
  Wire.write(0x02);
  Wire.write(0x01);
  Wire.endTransmission();
  delay(6);

  /* Move modules the resiger pointer to one of the axis data registers */
  Wire.beginTransmission(HMC5803L_Address);
  Wire.write(Axis);
  Wire.endTransmission();

  /* Read the data from registers (there are two 8 bit registers for each axis)
*/
  Wire.requestFrom(HMC5803L_Address, 2);
  Result = Wire.read() << 8;
  Result |= Wire.read();

  return Result;
}
```