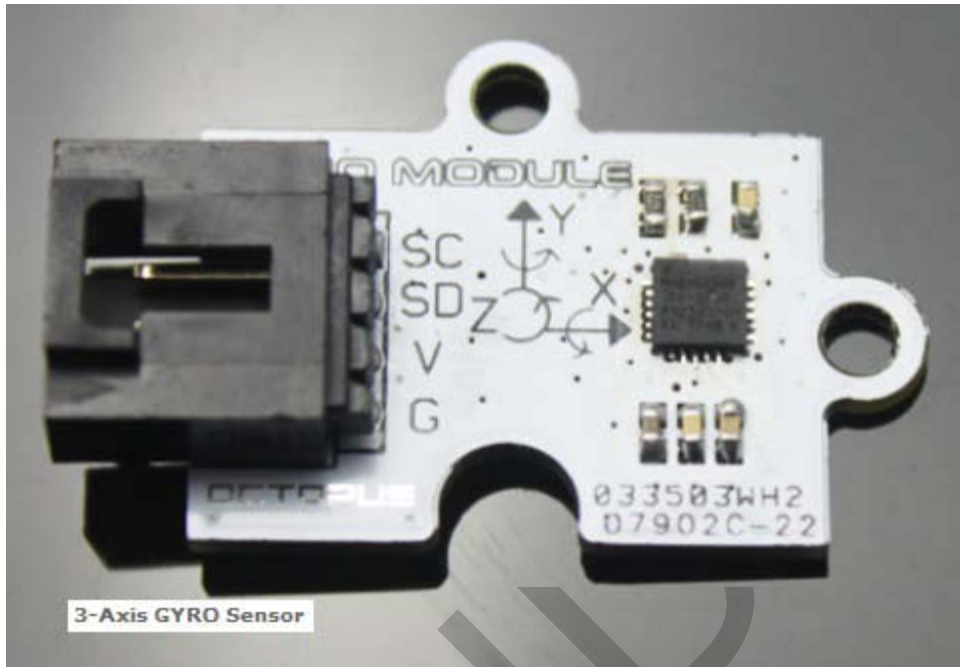


■ 3-Axis GYRO Sensor



1. 사양

1.1. Description

3-Axis GYRO Sensor는 IC ITG3205 axis gyro에 기반한 센서모듈이다. ITG3205는 digital output MEMS gyroscope로 3개의 16-bit analog-digital converter(ADC)와 digital gyro-scope output을 가진다. 고속의 I2C serial Interface(400KHZ)를 사용하며, temperature sensor와 2% accurate internal oscillator를 내장한다

1.2. Feature

the digital output X, Y, Z-axis angular value velocity sensor in a single circuit, with the least significant 16 bits (LSBs) ° / sec sensitivity and ± 2000 ° / sec full scale range.

the programmable digital low-pass filter

less than 6.5mA operating current, greatly extending battery life, standby current of only 5uA.

VDD power supply range 2.1V-3.6V

3-Axis GYRO Sensor

the digital output temperature sensor
high-speed I2C serial interface (400KHZ)
Power supply needs: 3.3V/5V
Fast response and High sensitivity
Simple drive circuit
Stable and long life

1.3. 구성

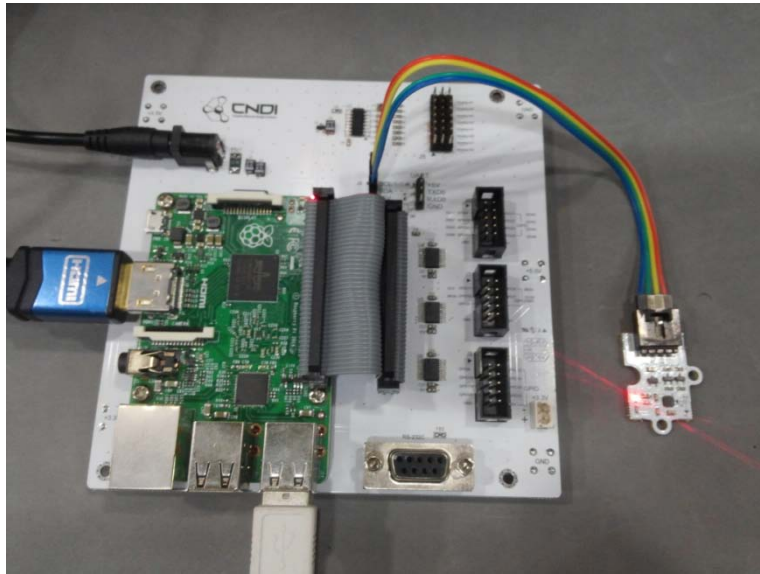
1 X 3-Axis GYRO Sensor
1 x Analog Sensor Cable

2. User Guide

2.1. 결선

모듈의 결선은 아래의 그림과 표를 이용하여 결선한다.

RaspberryPi	3-Axis GYRO Sensor
5V	V
GND	G
SDA	SD
SCL	SC



모듈의 장치 및 회로에 대한 상세한 내용은 데이터시트 및 회로도를 참고한다.

2.2. 예제프로그램

아래 예제 프로그램을 작성 후 컴파일 한 후 실행하면 3-Axis GYRO 센서에 입력 값을 디버그 메시지로 표시하는 동작을 한다.

I2C Load 명령 : **gpio load i2c**

컴파일 명령 : **gcc -o 3-Axis_Gyro_Sensor 3-Axis_Gyro_Sensor.c -l wiringPi**

실행 명령 : **./ 3-Axis_Gyro_Sensor**

- 3-Axis Gyro_Sensor.c

```
#include <stdio.h>
#include <string.h>
#include <errno.h>
#include <unistd.h>
#include <stdlib.h>
#include <stdint.h>
#include <time.h>
#include <wiringPi.h>
#include <wiringPiI2C.h>
```

3-Axis GYRO Sensor

```
#define WHO_AM_I          0x00
#define SMPLRT_DIV        0x15
#define DLPF_FS           0x16
#define GYRO_XOUT_H       0x1D
#define GYRO_XOUT_L       0x1E
#define GYRO_YOUT_H       0x1F
#define GYRO_YOUT_L       0x20
#define GYRO_ZOUT_H       0x21
#define GYRO_ZOUT_L       0x22

#define DLPF_CFG_0        1<<0
#define DLPF_CFG_1        1<<1
#define DLPF_CFG_2        1<<2
#define DLPF_FS_SEL_0     1<<3
#define DLPF_FS_SEL_1     1<<4

#define ITG_ADRESS        0x68

int main()
{
    int nCompass;
    if((nCompass = wiringPiI2CSetup(ITG_ADRESS)) == -1)
    {
        printf("Unable to initialise I2C");
        return 1;
    }

    // Configure the gyroscope
    // FS_SEL=3 : Set the gyroscope scale for the outputs to +/-2000 degrees per
second
    // DLPF_CFG=1 : Low Pass Filter Bandwidth = 188Hz, Internal Sample Rate = 1kHz
    wiringPiI2CWriteReg8(nCompass, DLPF_FS,
(DLPF_FS_SEL_0|DLPF_FS_SEL_1|DLPF_CFG_0));

    // F_sample = F_internal / ( divider + 1 )
```

```

// sample rate = 1kHz / ( 9 + 1 ) = 100Hz
// Set the sample rate to 100 hz, 10ms per sample
wiringPiI2CWriteReg8(nCompass, SMPLRT_DIV, 9);

int xRate, yRate, zRate, i;
unsigned char high[3], low[3], result[3];

while(1)
{
    high[0]=wiringPiI2CReadReg8(nCompass,GYRO_XOUT_H);
    low[0]=wiringPiI2CReadReg8(nCompass,GYRO_XOUT_L);

    high[1]=wiringPiI2CReadReg8(nCompass,GYRO_YOUT_H);
    low[1]=wiringPiI2CReadReg8(nCompass,GYRO_YOUT_L);

    high[2]=wiringPiI2CReadReg8(nCompass,GYRO_ZOUT_H);
    low[2]=wiringPiI2CReadReg8(nCompass,GYRO_ZOUT_L);

    for(i = 0; i<3; i++)
    {
        result[i] = (high[i] <<8) | low[i];
    }

    printf("x = %i, y = %i, z=%i\n",result[0],result[1],result[2]);
    delay(1000);
}

return 0;
}

```

3-Axis GYRO Sensor

```
root@raspberrypi:/home/pi/work# gcc -o 3-Axis_Gyro_Sensor 3-Axis_Gyro_Sensor.c -lwiringPi
root@raspberrypi:/home/pi/work# ./3-Axis_Gyro_Sensor
Unable to open I2C device: No such file or directory
root@raspberrypi:/home/pi/work# gpio load i2c
gpio: Warning (not an error): File not present: /dev/i2c-0
root@raspberrypi:/home/pi/work# ./3-Axis_Gyro_Sensor
x = 250, y = 10, z=245
x = 243, y = 18, z=208
x = 249, y = 19, z=209
x = 58, y = 236, z=181
x = 222, y = 203, z=102
x = 18, y = 123, z=158
x = 208, y = 188, z=3
x = 182, y = 18, z=113
x = 168, y = 246, z=92
```