

MPU6050

Overview

We will read acceleration data and gyroscope data of MPU6050 in this project

Experimental Materials:

Raspberry Pi *1

T-type expansion board *1

Breadboard*1

MPU6050 *1

Some DuPont lines

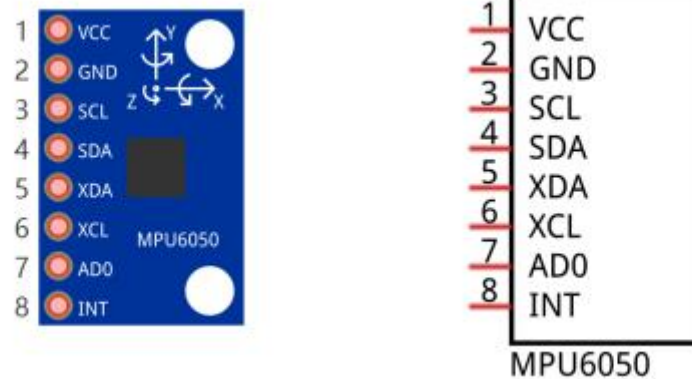
Product description:



MPU6050

MPU6050 is a sensor which integrates 3 axis accelerometer, 3 axes angular accelerometer (called gyroscope) and 1 digital attitude processor (DMP). The range of accelerometer and gyroscope of MPU6050 can be

changed. A digital temperature sensor with wide range and high precision is integrated within it for temperature compensation, and the temperature value can be also read out. The MPU6050 module follows I2C communication protocol and the default address is 0x68

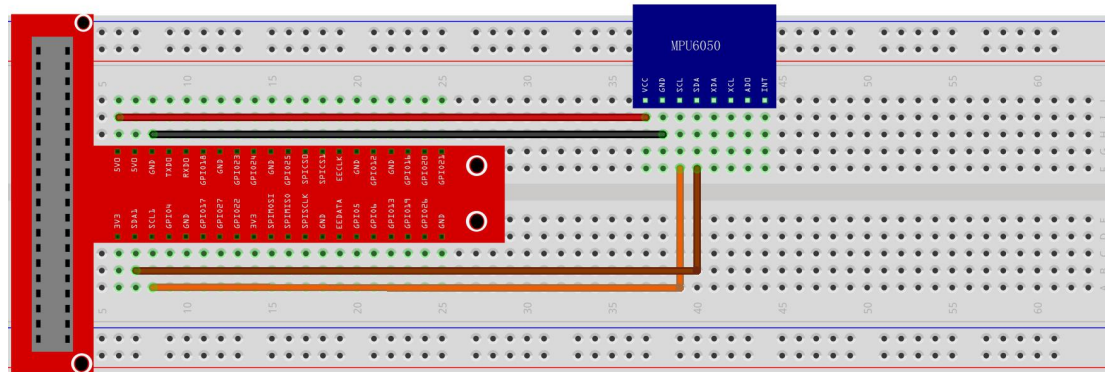


The port description of the MPU6050 module is as follows:

Pin name	Pin number	Description
VCC	1	Positive pole of power supply with voltage 5V
GND	2	Negative pole of power supply
SCL	3	I2C communication clock pin
SDA	4	I2C communication data pin
XDA	5	I2C host data pin which can be connected to other devices.
XCL	6	I2C host clock pin which can be connected to other devices.
AD0	7	I2C address bit control pin. Low level: the device address is 0x68 High level: the device address is 0x69
INT	8	Output interrupt pin

MPU6050 is widely used in the field of balancing vehicles, aircraft and others which need to control the attitude.

Wiring diagram:



Experimental results:

In the directory where the code file is located, execute the following command

C:

```
gcc MPU6050RAW.cpp MPU6050.cpp I2Cdev.cpp -o MPU6050RAW  
sudo ./MPU6050RAW
```

python:

```
python MPU6050RAW.py
```

After the program is executed, the terminal will display the original acceleration and gyroscope data of MPU6050, as well as the conversion to gravity acceleration and angular velocity as the unit of data. As shown in the following figure:

```

a/g: 8572 -13744 -8040 -1115 470 119
a/g: 0.52 g -0.84 g -0.49 g -8.51 d/s 3.59 d/s 0.91 d/s
a/g: 8412 -13912 -7808 -1194 308 187
a/g: 0.51 g -0.85 g -0.48 g -9.11 d/s 2.35 d/s 1.43 d/s
a/g: 8468 -13600 -7964 -1190 298 196
a/g: 0.52 g -0.83 g -0.49 g -9.08 d/s 2.27 d/s 1.50 d/s
a/g: 8544 -13924 -8088 -1166 408 130
a/g: 0.52 g -0.85 g -0.49 g -8.90 d/s 3.11 d/s 0.99 d/s
a/g: 8432 -13844 -8072 -1177 285 171
a/g: 0.51 g -0.84 g -0.49 g -8.98 d/s 2.18 d/s 1.31 d/s
a/g: 8620 -13956 -8012 -1211 349 112
a/g: 0.53 g -0.85 g -0.49 g -9.24 d/s 2.66 d/s 0.85 d/s
a/g: 8436 -13692 -7876 -1160 407 110
a/g: 0.51 g -0.84 g -0.48 g -8.85 d/s 3.11 d/s 0.84 d/s
a/g: 8372 -13744 -7828 -1247 366 192
a/g: 0.51 g -0.84 g -0.48 g -9.52 d/s 2.79 d/s 1.47 d/s
a/g: 8452 -13956 -7860 -1294 181 189
a/g: 0.52 g -0.85 g -0.48 g -9.88 d/s 1.38 d/s 1.44 d/s
a/g: 8712 -13856 -8096 -1181 403 153

```

Refer to the I2C Device tutorial in PCF8591 before using this chapter.