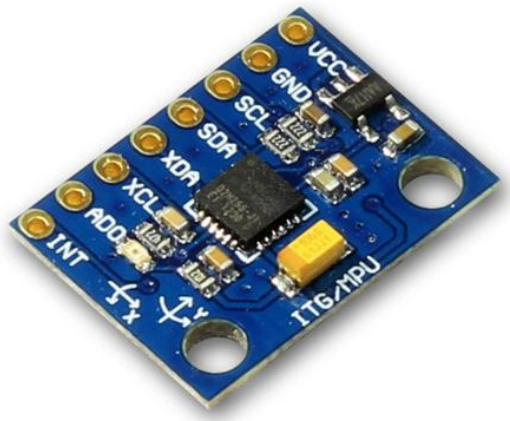
MPU6050 Accelerometer + Gyro Module

This Accelerometer + Gyro sensor module is based on InvenSense MPU-6050 sensor, contains a MEMS accelerometer and a MEMS gyro in a single chip. It is very accurate, as it contains 16-bits analog to digital conversion hardware for each channel. Therefore it captures the x, y, and z channel at the same time. The sensor uses the I2C-bus which can be easily interfaced with the Arduino board.



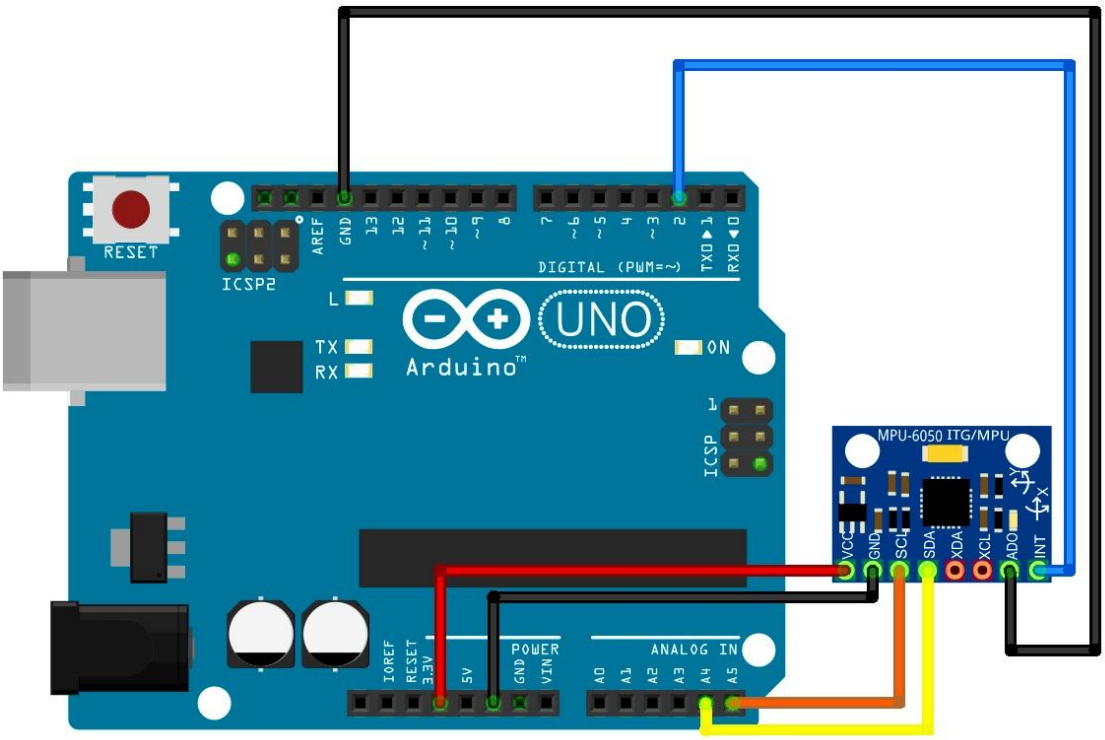
SKU: SSR-1011

Brief Specification:

- I2C Digital-output of 6 or 9-axis MotionFusion data in rotation matrix, quaternion, Euler Angle, or raw data format.
- Input Voltage: 2.3 - 3.4V.
- Tri-Axis angular rate sensor (gyro) with a sensitivity up to 131 LSBs/dps and a full-scale range of ±250, ±500, ±1000, and ±2000dps
- Tri-Axis accelerometer with a programmable full scale range of ±2g, ±4g, ±8g and ±16g
- Digital Motion Processing™ (DMP™) engine offloads complex MotionFusion, sensor timing synchronization and gesture detection.
- Embedded algorithms for run-time bias and compass calibration. No user intervention required.
- Digital-output temperature sensor.
- Module dimensions: 20x15mm (L x W).

Application Examples:

The standard MPU6050-Arduino connection comprises only VCC, GND, SCL and SDA pins although some sketches require also pin INT. Connection with Arduino UNO as shown below.



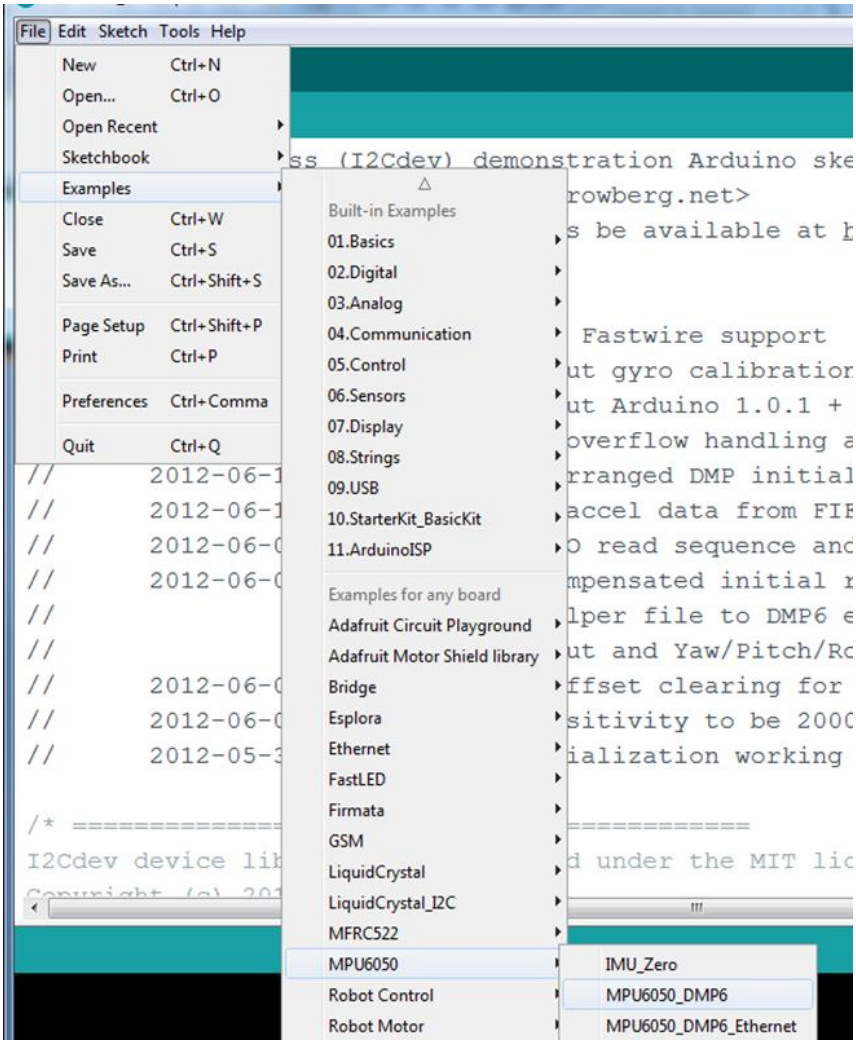
We need an Arduino library for MPU-6050 to work with Arduino boards. If we were to write the code from scratch, it would take ages and there would be a lot of reverse engineering required to make good use of the module's proprietary Digital Motion Processing (DMP) engine because Invensense intentionally released minimal data on its MPU6050. Good thing someone has already done the hard work for us; Jeff Rowberg wrote some Arduino libraries to obtain the accelerometer / gyro data and handle all the calculations. They are available as a zip file from here:

https://github.com/jrowberg/i2cdevlib/zipball/master

Once unzipped to your local folder, find the Arduino folder within it and copy the two folders "I2Cdev" and "MPU6050" over to your Arduino "libraries" folder in the following directory:

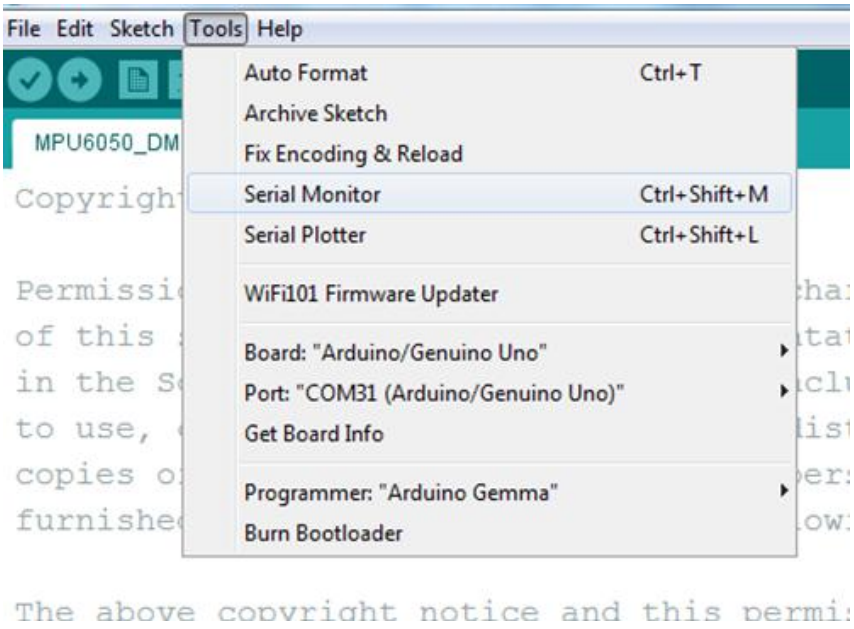
C:\Program Files (x86)\Arduino\libraries

Then open the Arduino IDE and in the examples section, you should find **MPU6050_DMP6** sketch within MPU6050.

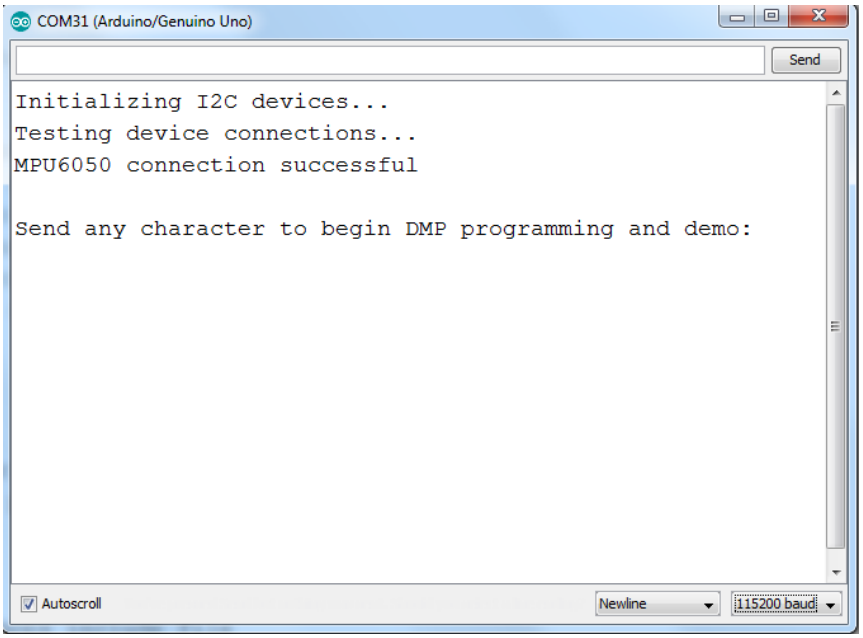


Open this sketch, plug your Arduino in, select the appropriate COM Port and upload the sketch to Arduino board.

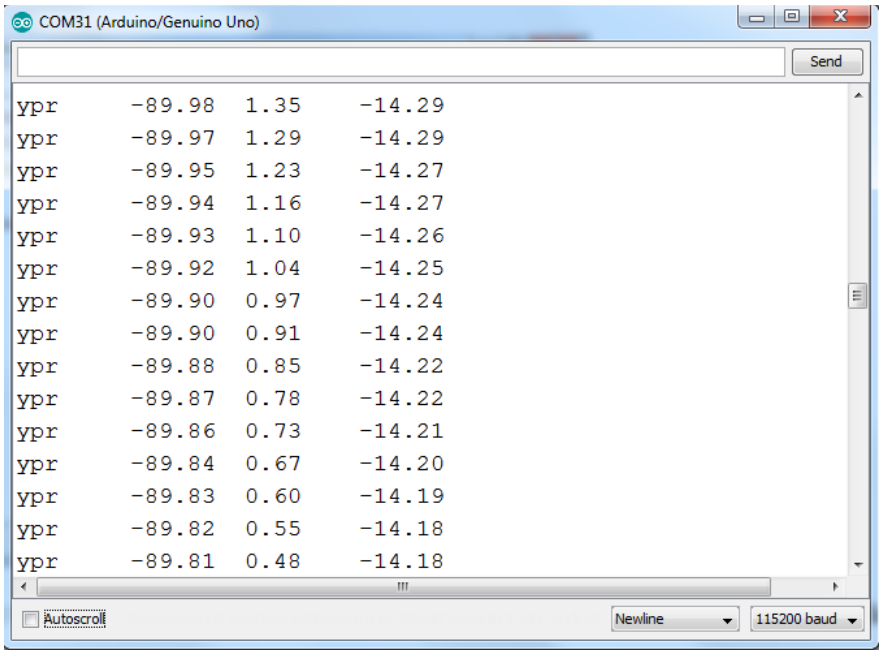
Open the Serial Monitor:



In the Serial Window, select a baud rate of 115200. You should be prompted that the MPU6050 connection was successful.



You can test the data collection by typing anything in the text bar and pressing enter, the data should start showing up.



Congratulation! You have correctly wired up and setup the library for MPU-6050 to work in Arduino environments.

We will proceed to a more exiting topic of this Accelerometer + Gyro sensor module application in our next revision of this user guide, stay tune !

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