



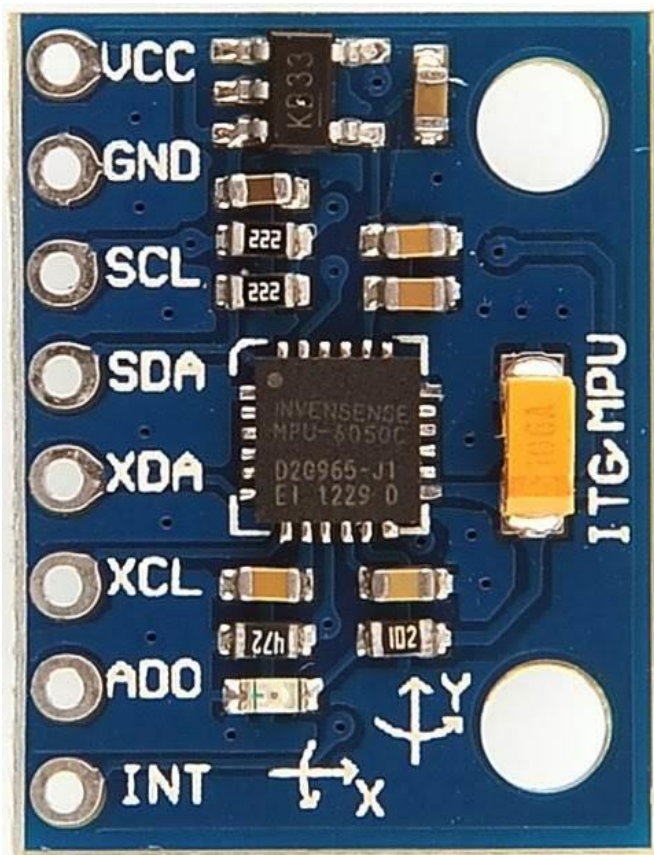
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# **Library for MPU-6050**



AGH

## MPU-6050



- VCC – Power supply, 3.3 V
- GND – Ground
- SCL – I2C clock
- SDA – I2C data
- XDA – Second I2C bus data
- XCL – Second I2C bus clock
- ADO – Selection of I2C slave address 0x68(=low) 0x69(=high)
- INT – Interrupt pin

## Specification:

- **Supply voltage:** from 2.375 to 3.46 V
- **Current consumption by gyroscope :** 3.6 mA
- **Power consumption by the accelerometer :** 500  $\mu$ A
- **Logic states:** depended from supply 2.4 lub 3.3 V
- **Communication:** I2C Bus - 400 kHz
- **Full-scale gyroscope :** +/-250, +/-500, +/-1000, +/-2000 degrees/sec
- **Full-scale accelerometer :** +/-2 g, +/-4 g, +/- 8 g, +/-16 g
- **Resolution:** 16 bit for each axis of each sensor
- **Measuring rate gyro :** from 4 to 8000 Hz
- **Measuring rate accel:** from 4 to 1000 Hz
- Buffer with 1024 of the last results

## Connection MPU-6050 with KL46z

VCC → P3V3

GND → GND

SCL → PTE1

SDA → PTE0

- XDA
  - XCL
  - ADO
  - INT (?)
- } Unused



# Functions

## Initialization:

Power on and prepare for general usage.

This will activate the device and take it out of sleep mode (which must be done after start-up).

This function also sets both the accelerometer and the gyroscope to their most sensitive settings, namely  $\pm 2g$  and  $\pm 250$  degrees/sec.

## Wake up:

Get wake cycle enabled status.

## Sleep mode:

Get sleep mode status.



# Functions

## Test connection:

Verify the I2C connection. Make sure the device is connected and responds as expected.

## Reset:

Reset all the sensors.

## Interrupts:

Free-fall interrupt

High-G interrupt

Zero Motion/Motion interrupt

FIFO Buffer Overflow

(Get interrupt logic level mode. Will be set 0 for active-high, 1 for active-low)

## Setup of the sensors:

Get full-scale gyroscope

0 = +/- 250 degrees/sec

1 = +/- 500 degrees/sec

2 = +/- 1000 degrees/sec

3 = +/- 2000 degrees/sec

Get full-scale accelerometer range.

0 = +/- 2g

1 = +/- 4g

2 = +/- 8g

3 = +/- 16g

## Self-test:

Get self-test enabled setting for accelerometer [X,Y,Z] axis  
Checking whether the device works.

## Get the values from sensors:

Get gyroscope X-axis value.

Get gyroscope Y-axis value.

Get gyroscope Z-axis value.



# Functions

## Communication between sensors:

Get wait-for-external-sensor-data enabled value.

This is used to ensure that both the internal sensor data from gyro and accelerometer data have been loaded to their respective data registers (the data is synced) when the Data Ready interrupt is triggered.

# Functions

## Low-pass filter configuraton:

The ADC sample rate is programmable from 8,000 samples per second, down to 3.9 samples per second, and user-selectable low-pass filters enable a wide range of cut-off frequencies.

We can use it for stabilization and more accurate data.