

MPU6050

Sensors / 6-axis IMU

I2C connections, scale factors and the six axes of robot motion.

01 Wiring & address

Bus

SDA to SDA, SCL to SCL, GND to GND. Pull-ups must match MCU logic.

Address

AD0 LOW = 0x68; AD0 HIGH = 0x69. Scan the I2C bus to confirm.

Supply

Bare IC: 2.375-3.46 V. Breakout regulators and pull-ups vary; inspect the board.

INT

Optional interrupt output for data-ready events.

02 Data interpretation

Accelerometer

X/Y/Z acceleration; selectable +/-2/4/8/16 g. At +/-2 g: 16384 LSB/g.

Gyroscope

X/Y/Z angular rate; +/-250/500/1000/2000 deg /s. At +/-250: 131 LSB/(deg /s).

Axes

Use board axis markings and the right-hand rule. At rest, gravity appears on the acceleration axes.

03 Startup

Wake

Clear sleep in PWR_MGMT_1 (0x6B); configure ranges and sample rate.

Calibrate

Average stationary gyro readings for bias; raw values are not directly roll/pitch/yaw.

Before you power on

MPU6050 has no magnetometer. Integrated yaw drifts; mounting orientation must match your code.

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Datasheets & further reading

TDK MPU6050 specification

<https://invensense.tdk.com/wp-content/uploads/2015/02/MPU-6000-Datasheet.pdf>