

lamaPLC: GY-511 6DOF sensor module

The GY-511 is a 6-degree-of-freedom (6DOF) sensor module that combines a 3-axis digital accelerometer and a 3-axis digital magnetometer into a single breakout board. It is primarily based on the **STMicroelectronics LSM303DLHC** chip and is widely used for creating electronic compasses and motion-tracking systems.

Key Specifications

- Sensor Chip: STMicroelectronics LSM303DLHC.
- Operating Voltage: **3V to 5V DC** (includes an integrated low-drop voltage regulator).
- Communication Interface: standard I²C protocol.
- Accelerometer Range: user-selectable at $\pm 2g$, $\pm 4g$, $\pm 8g$, and $\pm 16g$.
- Magnetometer Range: seven selectable ranges from ± 1.3 to ± 8.1 gauss.
- Resolution: built-in 12-bit ADC providing a 16-bit digital data output.

Pinout Configuration

The module typically features 8 pins, though only 4 are essential for basic operation with controllers like Arduino Uno:

Pin	Function	Description
VIN	Power Supply	3.3V to 5V input.
3V	Output	3.3V regulated output (up to 100mA).
GND	Ground	System ground.
SCL	I2C Clock	Clock signal for serial communication.
SDA	I2C Data	Data signal for serial communication.
INT1/2	Interrupts	Programmable for motion or free-fall detection.
DRDY	Data Ready	Indicator for new measured values.

Common Applications

- **Tilt-Compensated Compasses:** Determining heading even when the device isn't perfectly level.
- **Motion Tracking:** Used in wearables and fitness trackers to monitor activity levels.
- **Free-Fall Detection:** Identifying sudden drops to trigger safety mechanisms.
- **Drones & Robots:** Improving flight stability or navigational accuracy.

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