# Sensor to Raspberry Pi Connection Guide

## MPU6050 to Raspberry Pi (I2C)

| MPU6050 Pin | Connect to Raspberry Pi GPIO Pin |
|---|---|
| VCC | 3.3V (Pin 1) Power |
| GND | GND (Pin 6) Ground |
| SDA | GPIO 2 (Pin 3) I2C Data |
| SCL | GPIO 3 (Pin 5) I2C Clock |

## Ultrasonic Sensor (HC-SR04) to Raspberry Pi

| HC-SR04 Pin | Connect to Raspberry Pi GPIO | Notes |
|---|---|---|
| VCC | 5V (Pin 2 or 4) | Power |
| GND | GND (Pin 6) | Ground |
| TRIG | GPIO 23 (Pin 16) | Trigger Signal |
| ECHO | GPIO 24 (Pin 18) | Via Voltage Divider (5V -> 3.3V) |

## 2 Servo Motors to Raspberry Pi (PWM)

| Servo Pin | Connect to | Notes |
|---|---|---|
| VCC (Red) | External 5V Power | Never power from Pi |
| GND (Black/Brown) | Common Ground with Pi | Shared GND |
| Signal Servo 1 | GPIO18 (Pin 12) | PWM control |
| Signal Servo 2 | GPIO19 (Pin 35) | PWM control |

## Temperature Sensor (DS18B20) to Raspberry Pi

| DS18B20 Pin | Connect to Raspberry Pi | Notes |
|---|---|---|
| VCC (Red) | 3.3V (Pin 1) | Power |
| GND (Black) | GND (Pin 6) | Ground |
| Data (Yellow) | GPIO4 (Pin 7) | 1-Wire Data |
| 4.7kOhm Resistor | Between VCC and Data | Required pull-up resistor |

## Humidity Sensor (DHT11/DHT22) to Raspberry Pi

| DHT Pin | Connect to Raspberry Pi | Notes |
|---|---|---|
| VCC (Pin 1) | 3.3V (Pin 17) | Power supply |

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| | | |
|---|---|---|
| DATA (Pin 2) | GPIO17 (Pin 11) | Changed to avoid GPIO4 conflict |
| N/C (Pin 3) | Not Connected | Leave unconnected |
| GND (Pin 4) | GND (Pin 9) | Ground |

## MPU6050 and Ultrasonic Sensor to Arduino Uno Connections

■ MPU6050 to Arduino Uno:

| MPU6050 Pin | Arduino Uno Pin |
|---|---|
| VCC | 3.3V |
| GND | GND |
| SDA | A4 |
| SCL | A5 |

Note: The MPU6050 runs on 3.3V. Some versions can tolerate 5V, but it's safest to use 3.3V.

■ Ultrasonic Sensor (HC-SR04) to Arduino Uno:

| HC-SR04 Pin | Arduino Uno Pin |
|---|---|
| VCC | 5V |
| GND | GND |
| Trig | D9 |
| Echo | D10 |