ADXL345- Accelerometer Sensor

- The ADXL345 accelerometer sensor is a compact and versatile device commonly used in various applications to measure acceleration.
- It can detect changes in velocity and orientation across three axes: X, Y, and Z.
- This sensor employs micro-electromechanical systems (MEMS) technology to provide accurate and real-time acceleration data.
- The ADXL345 is capable of measuring both static acceleration (like the force of gravity) and dynamic acceleration (acceleration caused by motion or vibration).

Features

- Ultralow power: as low as 23 µA in measurement mode and 0.1 µA in standby mode at VS = 2.5 V (typical)
- Power consumption scales automatically with bandwidth
- User-selectable resolution
- Fixed 10-bit resolution
- Full resolution, where resolution increases with g range, up to 13-bit resolution at ±16 g (maintaining 4 mg/LSB scale factor in all g ranges)
- Embedded memory management system with FIFO technology minimizes host processor load
- Single tap/double-tap detection
- Activity/inactivity monitoring
- Free-fall detection
- Supply voltage range: 2.0 V to 3.6 V
- I/O voltage range: 1.7 V to VS
- SPI (3- and 4-wire) and I2C digital interfaces
- Flexible interrupt modes mappable to either interrupt pin
- Measurement ranges selectable via serial command
- Bandwidth selectable via serial command
- Wide temperature range (−40°C to +85°C)
- 10,000 g shock survival
- Pb free/RoHS compliant

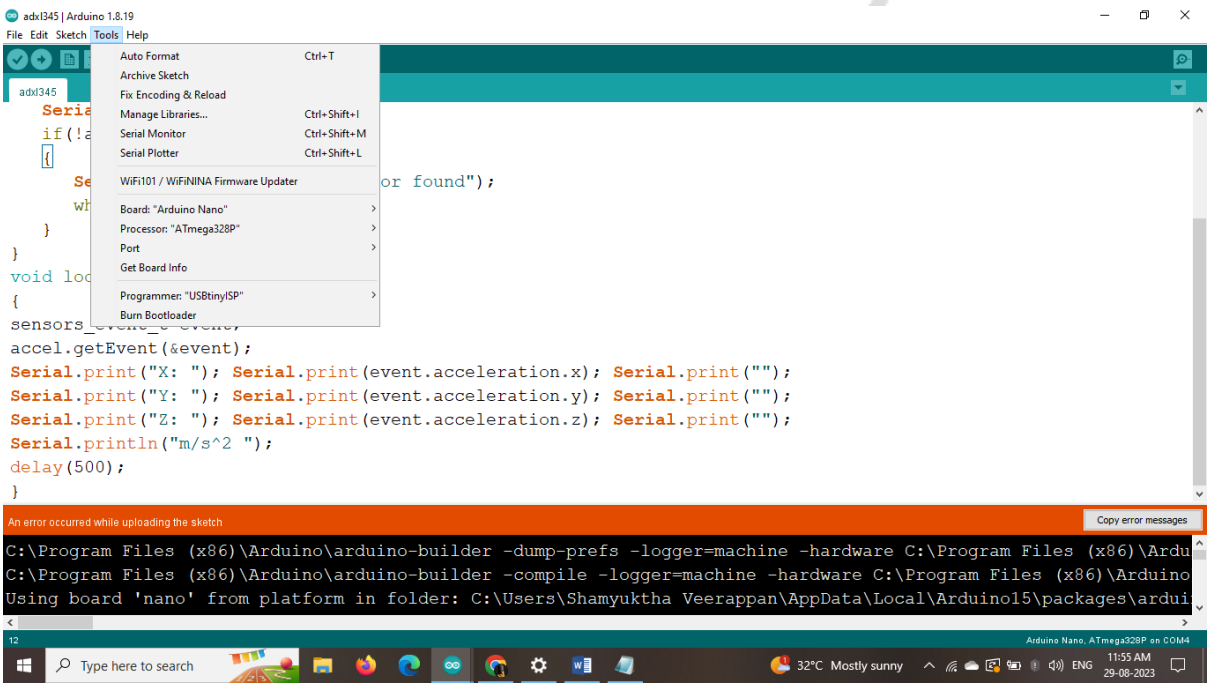
- Small and thin: 3 mm × 5 mm × 1 mm LGA package

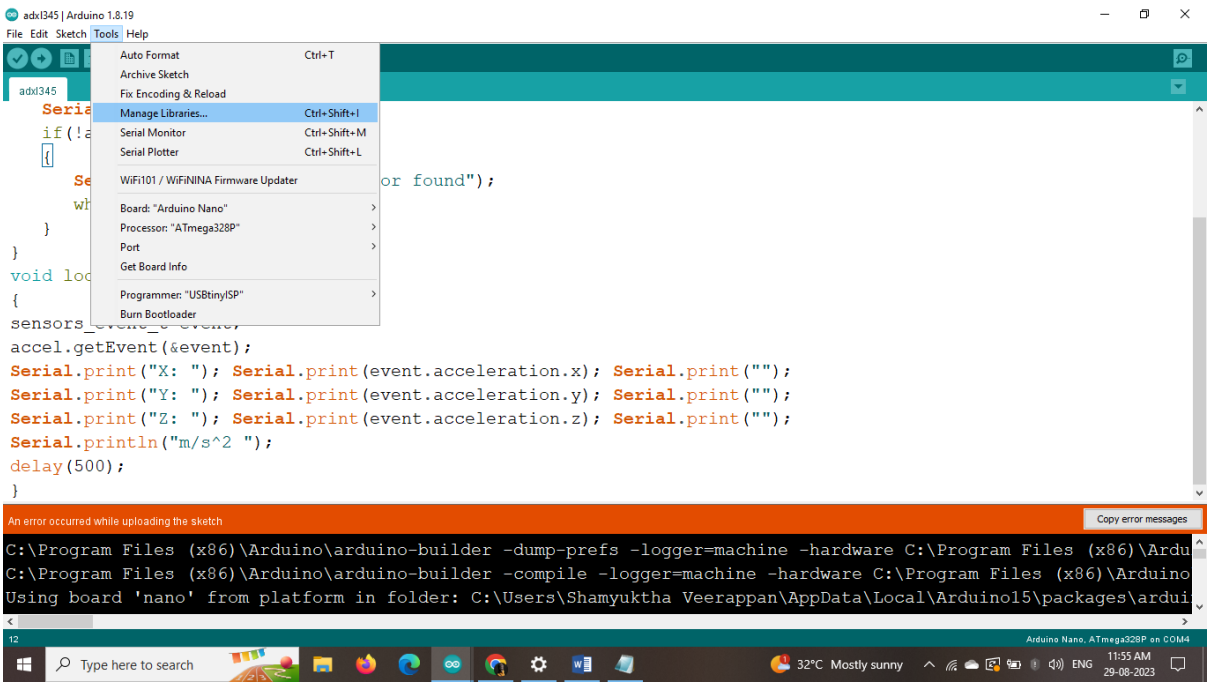
Connection with Arduino UNO

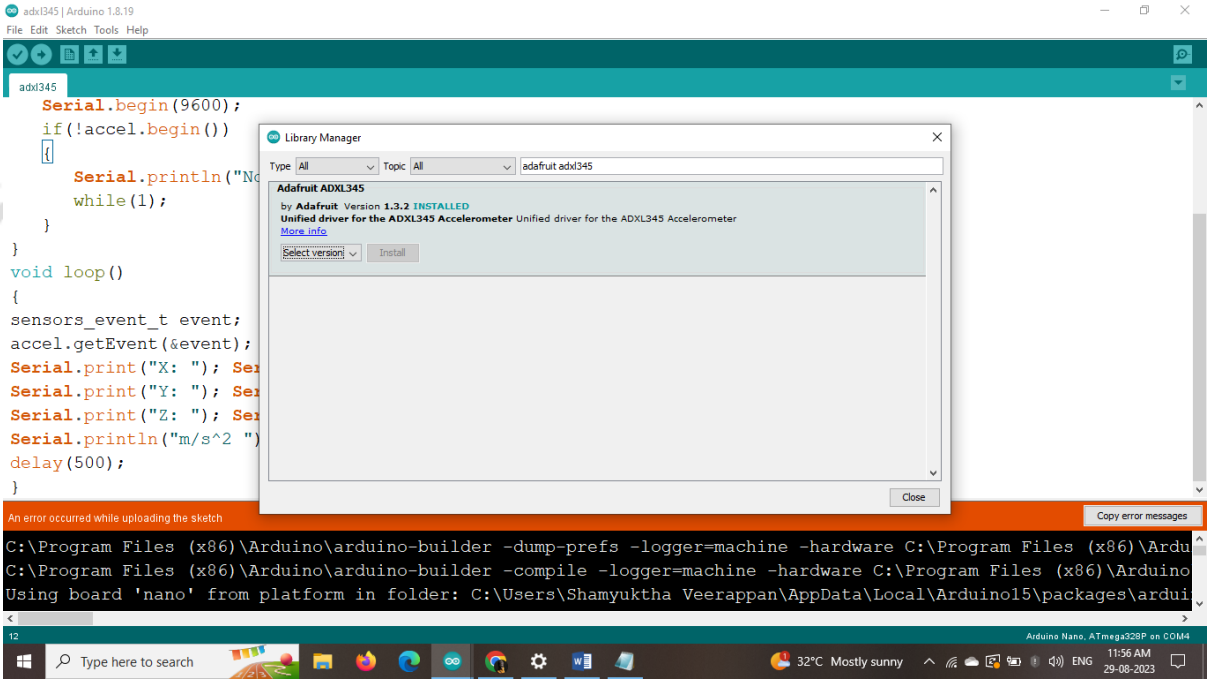
- Connect A4 pin (SDA) of Arduino -> SDA pin of adxl345.
- Connect A5 pin (SCL) of Arduino -> SCL pin of adxl345.
- Connect GND of Arduino -> GND pin of adxl345.
- Connect Vin of Arduino -> 5V of adxl345.

Installing the Required Dependency Library: Step-by-Step Process

- Open the Arduino IDE
- Go to the "Tools" menu at the top of the IDE window.
- Select "Manage Libraries" from the "Tools" dropdown menu
- Search for the Library
- Type "Adafruit ADXL345" into the search bar and press Enter.
- Choose the Latest Version
- Click on the "Install" button to start the installation process.
- The IDE will start downloading and installing the library.
- Once the installation is complete, you'll see a message confirming the successful installation of the library.
- Close the Library Manager window.







Basic Program for ADXL345 Sensor Interfacing

```
#include <Wire.h>

#include <Adafruit_Sensor.h>

#include <Adafruit_ADXL345_U.h>

Adafruit_ADXL345_Unified accel = Adafruit_ADXL345_Unified();
```

```
void setup(void)
{
  Serial.begin(9600);
  if(!accel.begin())
  {
    Serial.println("No valid sensor found");
    while(1);
  }
}
void loop(void)
{
  sensors_event_t event;
  accel.getEvent(&event);
  Serial.print("X: "); Serial.print(event.acceleration.x); Serial.print("  ");
  Serial.print("Y: "); Serial.print(event.acceleration.y); Serial.print("  ");
  Serial.print("Z: "); Serial.print(event.acceleration.z); Serial.print("  ");
  Serial.println("m/s^2 ");
  delay(500);
}
```

Output

After compiling and uploading the program, open the Serial Monitor to view the output.