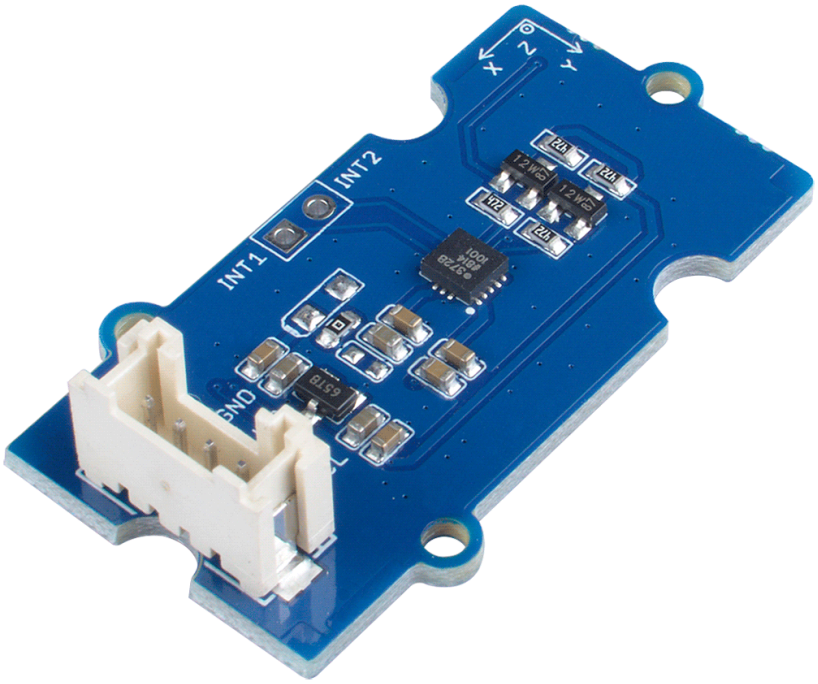
Grove - 3-Axis Digital Accelerometer 200g (ADXL372)



You can find a variety of 3-axis accelerometers [https://www.seeedstudio.com/tag/accelerometer.html] on our website that can meet different scenarios and needs. This time, we bring you the industrial grade, high stability, high precision and low power ADI ADXL series three-axis accelerometers.

The Grove - 3-Axis Digital Accelerometer ±200g (ADXL372) is a ultralow power digital output MEMS [https://www.seeedstudio.com/tag/MEMS.html] Accelerometer, it can provide a 12-bit output at 100 mg/LSB scale factor. The most notable feature of this sensor is its ultra-low power consumption(only 22μA in measurment mode) and large measurement range(±200g). All the data output via the Grove I2C port, the I2C address is changeable. In order to meet a wider range of measurement needs, the sampling rate can be selected from 400Hz/800Hz/1600Hz/3200Hz/6400Hz, and the bandwidth can be selected from 200Hz/400Hz/800Hz/1600Hz/3200Hz. In addition to being used as an acceleration measurement, you can also use this module to do impact and shock detection.

The ADI ADXL Series Accelerometer includes four products that will meet your different range and output needs:

Product	Measurement Range	Output Port	Pow Con
Grove - 3-Axis Analog Accelerometer ±20g (ADXL356B) [https://www.seeedstudio.com/Grove-3-Axis-Analog-Accelerometer-20g-ADXL356B-p-4004.html]	±10 ±20g	Analog	mea moc star moc
Grove - 3-Axis Analog Accelerometer ±40g (ADXL356C) [https://www.seeedstudio.com/Grove-3-Axis-Analog-Accelerometer-40g-ADXL356C-p-4006.html]	±10g ±40g	Analog	mea moc star moc
Grove - 3-Axis Digital Accelerometer ±40g (ADXL357) [https://www.seeedstudio.com/Grove-3-Axis-Digital-Accelerometer-40g-ADXL357-p-4005.html]	±10g@51200 LSB/g ±20g@25600 LSB/g ±40g@12800 LSB/g	Digital I2C	mea moc
Grove - 3-Axis Digital Accelerometer ±200g (ADXL372) [https://www.seeedstudio.com/Grove-3-Axis-Digital-Accelerometer-200g-ADXL372-p-4003.html]	±200g	Digital I2C	mea moc

Get One Now

[https://www.seeedstudio.com/Grove-3-Axis-Digital-Accelerometer-200g-ADXL372-p-4003.html]

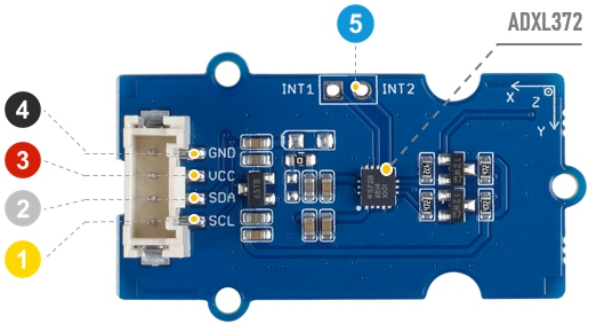
Features

- Large measuring range: ±200g
- Ultralow power consumption: 22 μA at 3200 Hz ODR
- Selectable oversampling ratio and bandwidth
- Deep embedded FIFO to minimize host processor load
- Build-in 12-bit analog-to-digital converter (ADC)

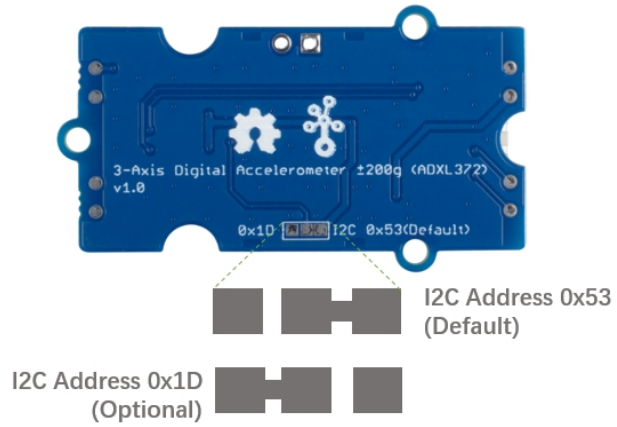
APPLICATIONS

- Portable Internet of Things (IoT) edge nodes
- Concussion and head trauma detection
- Impact and shock detection
- Asset health assessment

Pinout



4 **GND**: connect this module to the system GND
3 **VCC**: you can use 5V or 3.3V for this module
2 **SDA**: serial data of I2C
1 **SCL**: serial clock of I2C
5 **Interrupt Output**: two channel interrupt output



Specification

Parameter	Value
Supply voltage	3.3V / 5V
Operating ambient temperature	-40 – 125℃
Sensitivity at X_{OUT}, Y_{OUT}, Z_{OUT} (Ratiometric to V_{1P8ANA})	±50mg/°C(Nowmal Operation.) ±35mg/°C(Low Noise Mode.)
Sensitivity Change due to Temperature	±0.01%/°C (TA = −40°C to +125°C)
0g OFFSET	±1g(.Typ)
Output interface	Digital

Platforms Supported

Arduino	Raspberry Pi		

Getting Started

Play With Arduino

Materials required

Seeeduino V4.2	Base Shield
	
Get ONE Now [https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html]	Get ONE Now [https://www.seeedstudio.com/Base Shield-V2-p-1378.html]

> In addition, you can consider our new Seeeduino Lotus M0+ [https://www.seeedstudio.com/Seeeduino-Lotus-Cortex-M0-p-2896.html], which is equivalent to the combination of Seeeduino V4.2 and Baseshield.

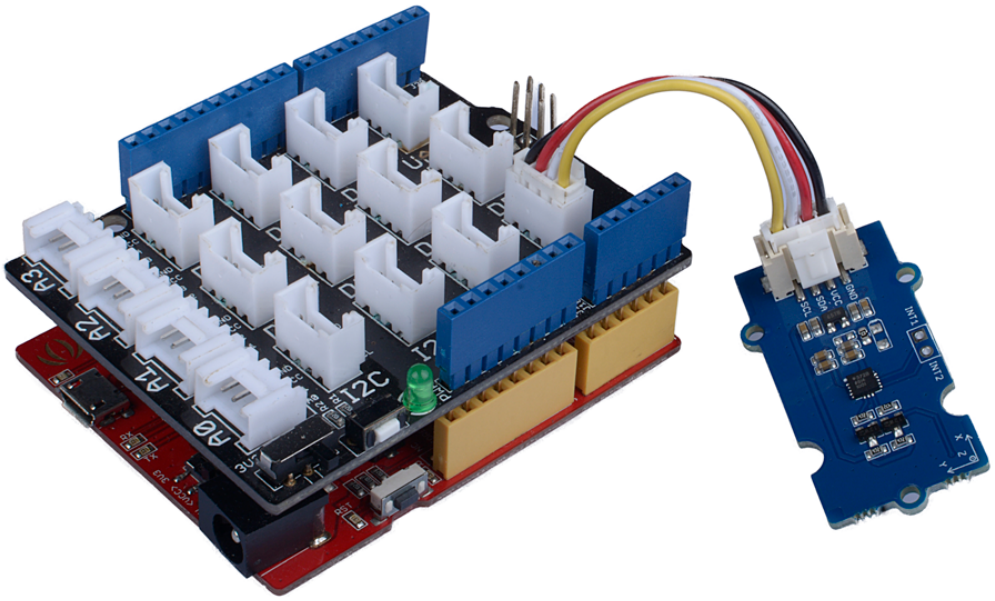
Note

1 Please plug the USB cable gently, otherwise you may damage the port. Please use the USB cable with 4 wires inside, the 2 wires cable can't transfer data. If you are not sure about the wire you have, you can click here [https://www.seeedstudio.com/Micro-USB-Cable-48cm-p-1475.html] to buy

2 Each Grove module comes with a Grove cable when you buy. In case you lose the Grove cable, you can click here [https://www.seeedstudio.com/Grove-Universal-4-Pin-Buckled-20cm-Cable-%285-PCs-pack%29-p-936.html] to buy.

Hardware Connection

- **Step 1.** Connect the Grove - 3-Axis Analog Accelerometer ±200g (ADXL372) to the **I2c** port of the Base Shield.
- **Step 2.** Plug Grove - Base Shield into Seeeduino.
- **Step 3.** Connect Seeeduino to PC via a USB cable.

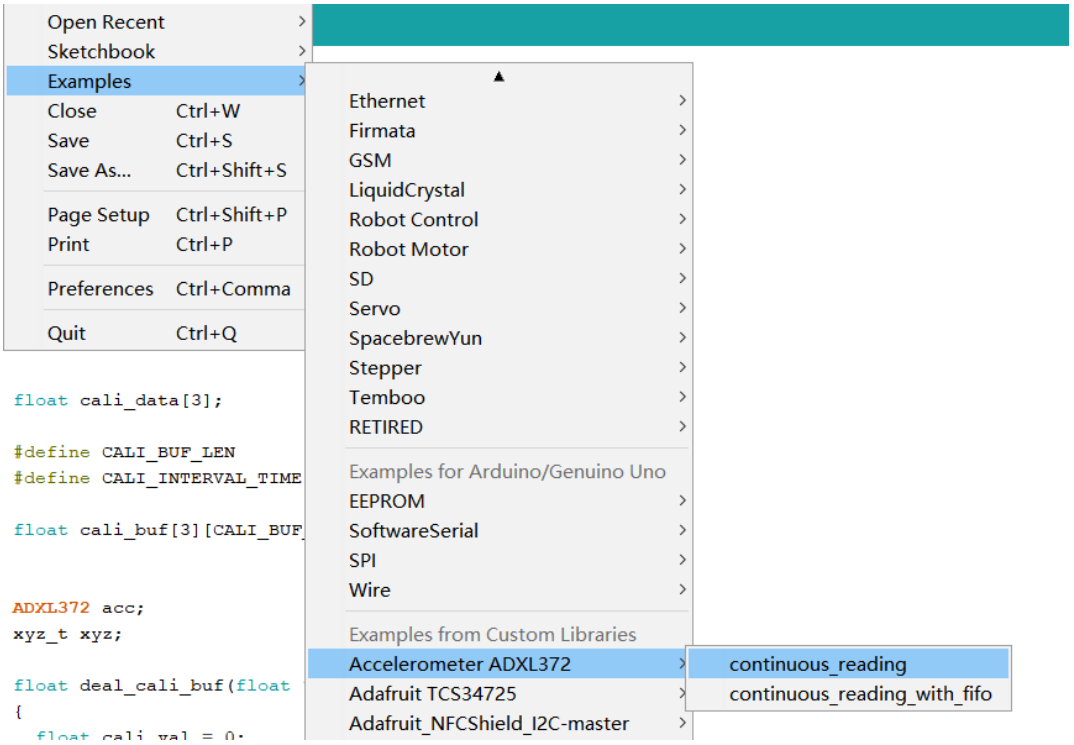


Software

> **Attention**
> If this is the first time you work with Arduino, we strongly recommend you to see Getting Started with Arduino [https://wiki.seeedstudio.com/Getting_Started_with_Arduino/] before the start.

- **Step 1.** Download the Seeed_ADXL_372 library [https://github.com/Seeed-Studio/Accelerometer_ADXL372] from Github.
- **Step 2**. Refer to How to install library [https://github.com/Seeed-Studio/Multi_Channel_Relay_Arduino_Library] to install library for Arduino.

- **Step 3**. Then open `example/ADXL_372/continuous_reading`




```
//continuous_reading.ino

#include "Wire.h"
#include "adxl372.h"

#ifdef ARDUINO_SAMD_VARIANT_COMPLIANCE
  #define SERIAL SERIALUSB
  #define SYS_VOL   3.3
#else
  #define SERIAL Serial
  #define SYS_VOL   5
#endif


float cali_data[3];

#define CALI_BUF_LEN           15
#define CALI_INTERVAL_TIME     250

float cali_buf[3][CALI_BUF_LEN];

```

```
22
23  ADXL372 acc;
24  xyz_t xyz;
25
26  float deal_cali_buf(float *buf)
27  {
28      float cali_val = 0;
29
30      for(int i = 0;i < CALI_BUF_LEN;i++)
31      {
32          cali_val += buf[i];
33      }
34      cali_val = cali_val/CALI_BUF_LEN;
35      return (float)cali_val;
36  }
37
38
39  void calibration(void)
40  {
41      SERIAL.println("Please Place the module horizontall
42      delay(1000);
43      SERIAL.println("Start calibration.........");
44
45
46      for(int i=0;i<CALI_BUF_LEN;i++)
47      {
48          while (!(acc.status() & DATA_READY));
49          acc.read(&xyz);
50          cali_buf[0][i] = xyz.x;
51          cali_buf[1][i] = xyz.y;
52          cali_buf[2][i] = xyz.z;
53          delay(CALI_INTERVAL_TIME);
54          SERIAL.print('.');
55      }
56      SERIAL.println('.');
57      for(int i=0;i<3;i++)
58      {
59          cali_data[i] =  deal_cali_buf(cali_buf[i]);
60          if(2 == i){
61
62              cali_data[i] -= 10;
```

```
        }
        SERIAL.println(cali_data[i]);
    }
    SERIAL.println("Calibration OK!!");
}


void setup() {
  SERIAL.begin(115200);

  acc.begin();

  SERIAL.println(acc.id(), HEX);
  acc.timing_ctrl(RATE_400);
  acc.measurement_ctrl(BW_200, true);
  acc.power_ctrl(MEASUREMENT_MODE);
  acc.setActiveTime(10);

  calibration();
}

void loop() {
  if (acc.status() & DATA_READY) {
    acc.read(&xyz);
    SERIAL.print("X position acc = ");
    SERIAL.print((xyz.x - cali_data[0]) / 10.0);
    SERIAL.println(" g ");
    SERIAL.print("Y position acc = ");
    SERIAL.print((xyz.y - cali_data[1]) / 10.0);
    SERIAL.println(" g ");
    SERIAL.print("Z position acc = ");
    SERIAL.print((xyz.z - cali_data[2]) / 10.0);
    SERIAL.println(" mg ");
  }
  SERIAL.println("   ");
  SERIAL.println("   ");
  delay(1000);
}
```

- **Step 4.** Upload the demo. If you do not know how to upload the code, please check How to upload code [https://wiki.seeedstudio.com/Upload_Code/].
- **Step 5.** Open the **Serial Monitor** of Arduino IDE by click **Tool-> Serial Monitor**. Or tap the `Ctrl` + `Shift` + `M` key at the same time. Set the baud rate to **115200**.
- **Step 6. Calibration** wait for calibration, just few seconds the calibration will be finished
- **Step 7.** Now you can use this sensor, and the output will be like this:

```
Please Place the module horizontally!
Start calibration........
................
18.07
-10.73
-40.13
Calibration OK!!
X position acc = 0.09 g
Y position acc = 0.17 g
Z position acc = 1.31 mg


X position acc = -0.11 g
Y position acc = -0.03 g
Z position acc = 1.31 mg
```

Schematic Online Viewer

Resources

- **[ZIP]** Grove-3-Axis_Digital_Accelerometer-200g-ADXL372 Schematic file [https://files.seeedstudio.com/wiki/Grove-3-Axis_Digital_Accelerometer-200g-ADXL372/res/Grove%20-%203-Axis%20Digital%20Accelerometer%20%C2%B1200g%20(ADXL372).zip]

- **[PDF]** ADXL 372 Datasheet [https://files.seeedstudio.com/wiki/Grove-3-Axis_Digital_Accelerometer-200g-ADXL372/res/Grove%20-%203-Axis%20Digital%20Accelerometer%20%C2%B1200g%20(ADXL372).zip]

Tech Support

Please submit any technical issue into our forum [https://forum.seeedstudio.com/]

[https://www.seeedstudio.com/act-4.html?utm_source=wiki&utm_medium=wikibanner&utm_campaign=newproducts]