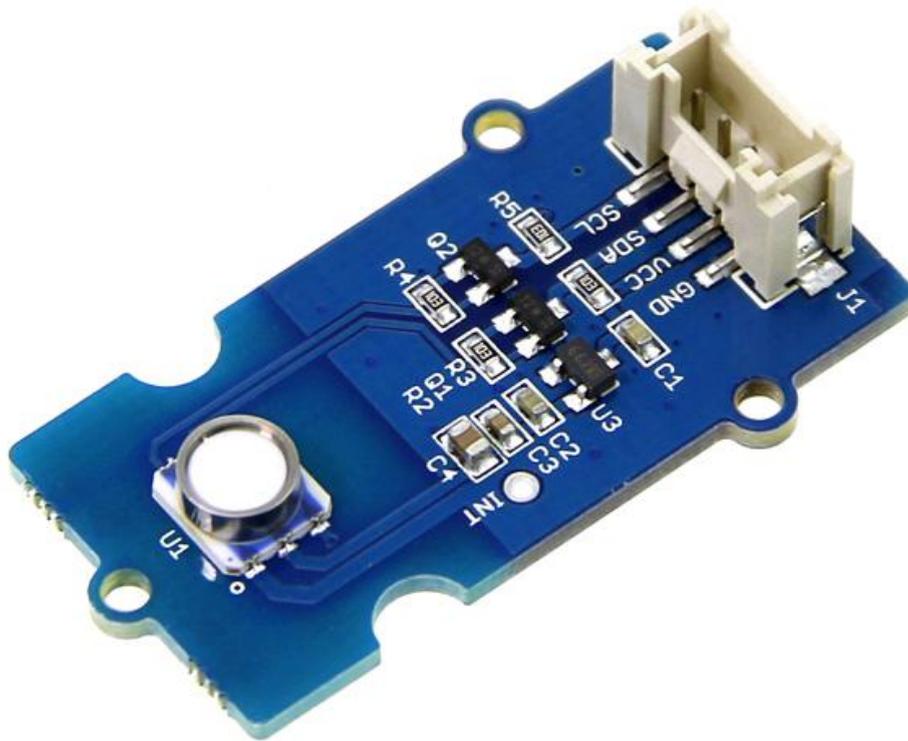


# Grove - Barometer (High-Accuracy)



This Grove - Barometer (High-Accuracy) Sensor features a HP206C high-accuracy chip to detect barometric pressure ,Altimeter and temperature. It can widely measure pressure ranging from 300mbar~1200mbar, with a super high accuracy of 0.01mbar(0.1m) in ultra-high resolution mode.The chip only accepts 1.8V to 3.6V input voltage. However, with outer circuit added, this

module becomes compatible with 3.3V and 5V. Therefore, it can be used on Arduino/Seeedduino or Seeedduino Stalker without modification. It is designed to be connected directly to a micro-controller via the I2C bus.

[Get One Now !\[\]\(99f58673407353e96a019fbca558fd72\_img.jpg\)](#)

[[https://www.seeedstudio.com/Grove-Barometer-\(High-Accuracy\)-p-1865.html](https://www.seeedstudio.com/Grove-Barometer-(High-Accuracy)-p-1865.html)]

## Features

- Digital two wire (I2C) interface
- Command-based Reading, Compensated (Optional)
- Programmable Events and Interrupt Controls
- Full Data Compensation
- Wide barometric pressure range
- Flexible supply voltage range
- Ultra-low power consumption
- Altitude Resolution down to 0.01 meter
- Temperature measurement included
- I2C Address: 0x76



### Note

If you want to use multiple I2C devices, please refer to [Software I2C](#) [[https://wiki.seeedstudio.com/Arduino\\_Software\\_I2C\\_user\\_guide/](https://wiki.seeedstudio.com/Arduino_Software_I2C_user_guide/)].



### Tip

More details about Grove modules please refer to [Grove System](https://wiki.seeedstudio.com/Grove_System/)  
[[https://wiki.seeedstudio.com/Grove\\_System/](https://wiki.seeedstudio.com/Grove_System/)]

## Application Ideas

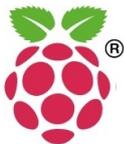
- High Precision Mobile Altimeter / Barometer
- Industrial Pressure and Temperature Sensor System
- Automotive Systems
- Personal Electronics Altimetry
- Adventure and Sports watches
- Medical Gas Control System
- Weather Station Equipment
- Indoor Navigation and Map Assist
- Heating, Ventilation, Air Conditioning

## Specifications

Item	Min	Typical	Max	Unit
Voltage	3.3	5	5.5	VDC
Current	635	/	1100	uA
Pressure Range	300	/	1200	hPa
Faster I2C data transfer	/	/	10	MHz
Dimension	20.4*41.8*9.7			mm
Weight	/			g



## Platforms Supported

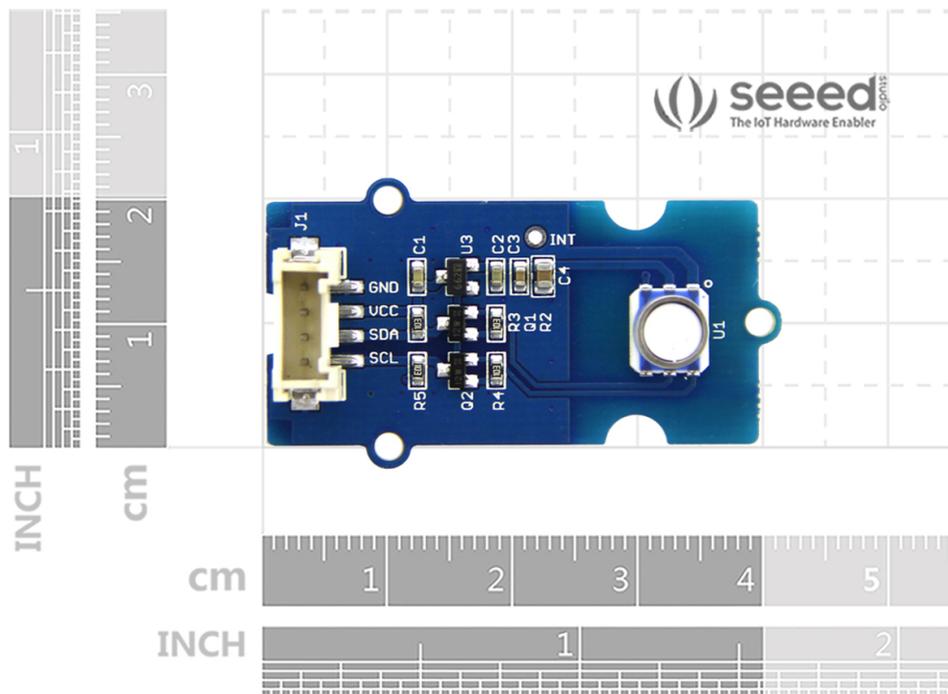
Arduino	Raspberry Pi		
			



 **Caution**

The platforms mentioned above as supported is/are an indication of the module's software or theoretical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

## Hardware Overview



## Getting started

## Play with Arduino

Barometric condition is one of the criteria used to predict coming change in weather and altitude above sea level. Here is a demo to

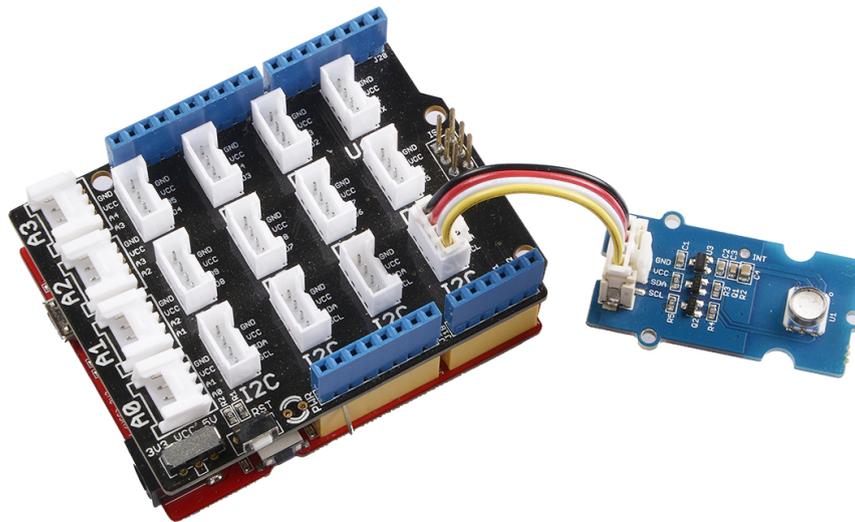
show you how to read the barometric data from this Grove - Barometer Sensor.

## Hardware

- **Step 1.** Prepare the below stuffs:

Seeeduino V4.2	Base Shield
	
<p><a href="https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html">Get One Now</a> [https://www.seeedstudio.com/Seeeduino-V4.2-p-2517.html]</p>	<p><a href="https://www.seeedstudio.com/Base-Shield-V2-p-1378.html">Get One Now</a> [https://www.seeedstudio.com/Base-Shield-V2-p-1378.html]</p>

- **Step 2.** Connect Grove-Barometer-High-Accuracy to port **I2C** of Grove-Base Shield.
- **Step 3.** Plug Grove - Base Shield into Seeeduino.
- **Step 4.** Connect Seeeduino to PC via a USB cable.



### Note

If we don't have Grove Base Shield, We also can directly connect this module to Seeduino as below.

seeduino_v4	Grove-Barometer-High-Accuracy
5V	VCC
GND	GND
SDA	SDA
SCL	SCL

## Software

**Step 1.** Download the [library](https://github.com/Seeed-Studio/Grove_Barometer_HP20x) [https://github.com/Seeed-Studio/Grove\_Barometer\_HP20x] from Github.

**Step 2.** Refer [How to install library](https://wiki.seeedstudio.com/How_to_install_Arduino_Library) [https://wiki.seeedstudio.com/How\_to\_install\_Arduino\_Library] to install library for Arduino.

**Step 3.** Create a new Arduino sketch and paste the codes below to it or open the code directly by the path:File -> Example ->Barometer\_Sensor->Barometer\_Sensor.

Here is the code

```
1  /*
2  * Demo name   ?: HP20x_dev demo
3  * Usage      ?: I2C PRECISION BAROMETER AND ALTIMETER [H
4  * Author     ?: Oliver Wang from Seeed Studio
5  * Version    ?: V0.1
6  * Change Log ?: Add kalman filter 2014/04/04
7  */
8
9  #include <HP20x_dev.h>
10 #include <KalmanFilter.h>
11
12 #include "Arduino.h"
13 #include "Wire.h"
14
15 unsigned char ret = 0;
16
17     /* Instance */
18 KalmanFilter t_filter;    //temperature filter
19 KalmanFilter p_filter;   //pressure filter
20 KalmanFilter a_filter;   //altitude filter
21
22
23 void setup()
24 {
25     Serial.begin(9600);    // start serial for output
```

```
26
27   Serial.println("****HP20x_dev demo by seeed studio**");
28   Serial.println("Calculation formula: H = [8.5(101325
29     /* Power up, delay 150ms, until voltage is stable*/
30   delay(150);
31     /* Reset HP20x_dev*/
32   HP20x.begin();
33   delay(100);
34
35     /* Determine HP20x_dev is available or not*/
36   ret = HP20x.isAvailable();
37   if(OK_HP20X_DEV == ret)
38   {
39     Serial.println("HP20x_dev is available.\n");
40   }
41   else
42   {
43     Serial.println("HP20x_dev isn't available.\n");
44   }
45
46 }
47
48
49 void loop()
50 {
51   char display[40];
52   if(OK_HP20X_DEV == ret)
53   {
54     Serial.println("-----\n");
55     long Temper = HP20x.ReadTemperature();
56     Serial.println("Temper:");
57     float t = Temper/100.0;
58     Serial.print(t);
59     Serial.println("C.\n");
60     Serial.println("Filter:");
61     Serial.print(t_filter.Filter(t));
62     Serial.println("C.\n");
63
64     long Pressure = HP20x.ReadPressure();
65     Serial.println("Pressure:");
66     t = Pressure/100.0;
```

```
67     Serial.print(t);
68     Serial.println("hPa.\n");
69     Serial.println("Filter:");
70     Serial.print(p_filter.Filter(t));
71     Serial.println("hPa\n");
72
73     long Altitude = HP20x.ReadAltitude();
74     Serial.println("Altitude:");
75     t = Altitude/100.0;
76     Serial.print(t);
77     Serial.println("m.\n");
78     Serial.println("Filter:");
79     Serial.print(a_filter.Filter(t));
80     Serial.println("m.\n");
81     Serial.println("-----\n");
82     delay(1000);
83 }
84 }
```

**Step 4.** Open the serial monitor to receive the sensor's data including temperature, barometric pressure value, relative atmosphere pressure and altitude.

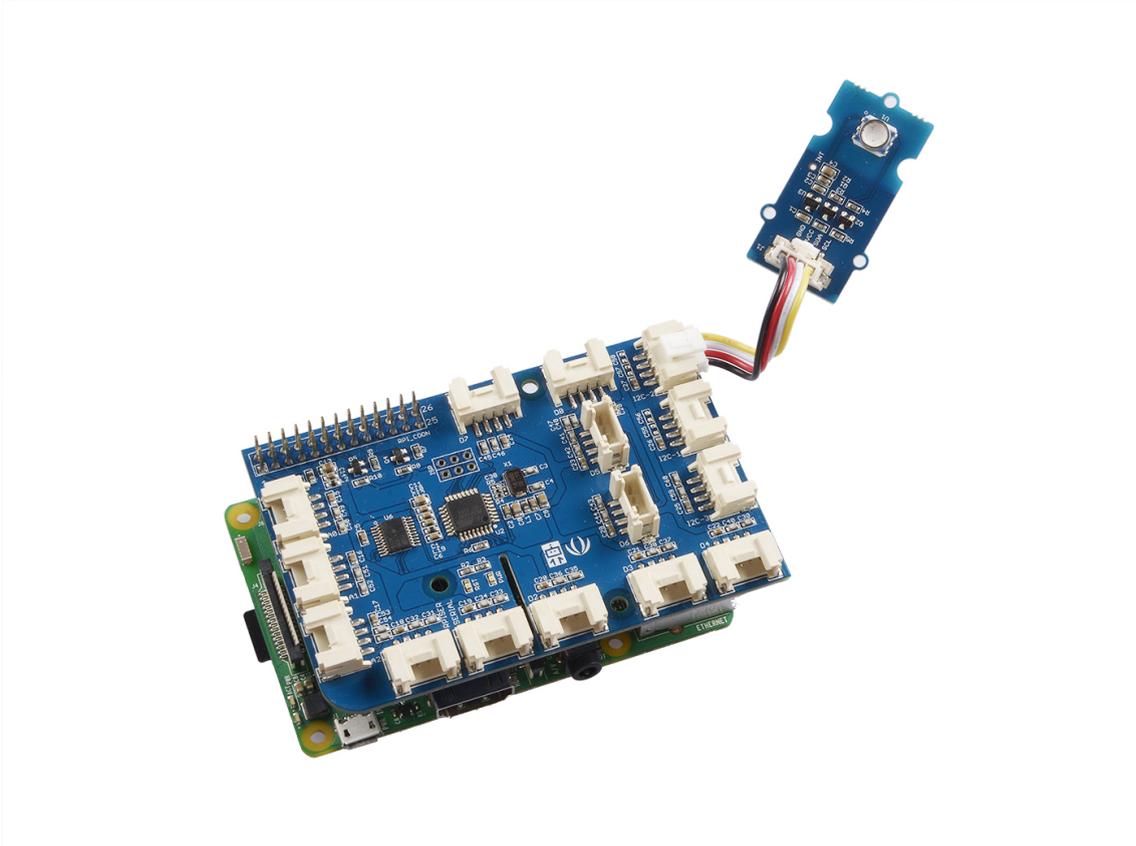
## Play With Raspberry Pi

### Hardware

- **Step 1.** Prepare the below stuffs:

Raspberry pi	GrovePi_Plus
	
<p><a href="https://www.seeedstudio.com/Raspberry-Pi-3-Model-B-p-2625.html">Get One Now</a> [https://www.seeedstudio.com/Raspberry-Pi-3-Model-B-p-2625.html]</p>	<p><a href="https://www.seeedstudio.com/GrovePi-Plus-p-2241.html">Get One Now</a> [https://www.seeedstudio.com/GrovePi-Plus-p-2241.html]</p>

- **Step 2.** Plug the GrovePi\_Plus into Raspberry.
- **Step 3.** Connect Grove-Barometer-High-Accuracy to **I2C** port of GrovePi\_Plus.
- **Step 4.** Connect the Raspberry to PC through USB cable.



## Software

- **Step 1.** Follow [Setting Software](https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/setting-software/) [https://www.dexterindustries.com/GrovePi/get-started-with-the-grovepi/setting-software/] to configure the development environment.
- **Step 2.** Git clone the Github repository.

```
1 cd ~  
2 git clone https://github.com/DexterInd/GrovePi.git
```

- **Step 3.** Excute below commands to use this sensor

```
1 cd ~/GrovePi/Software/Python/grove_barometer_sensors/high  
2 python high_accuracy_barometer_example.py
```

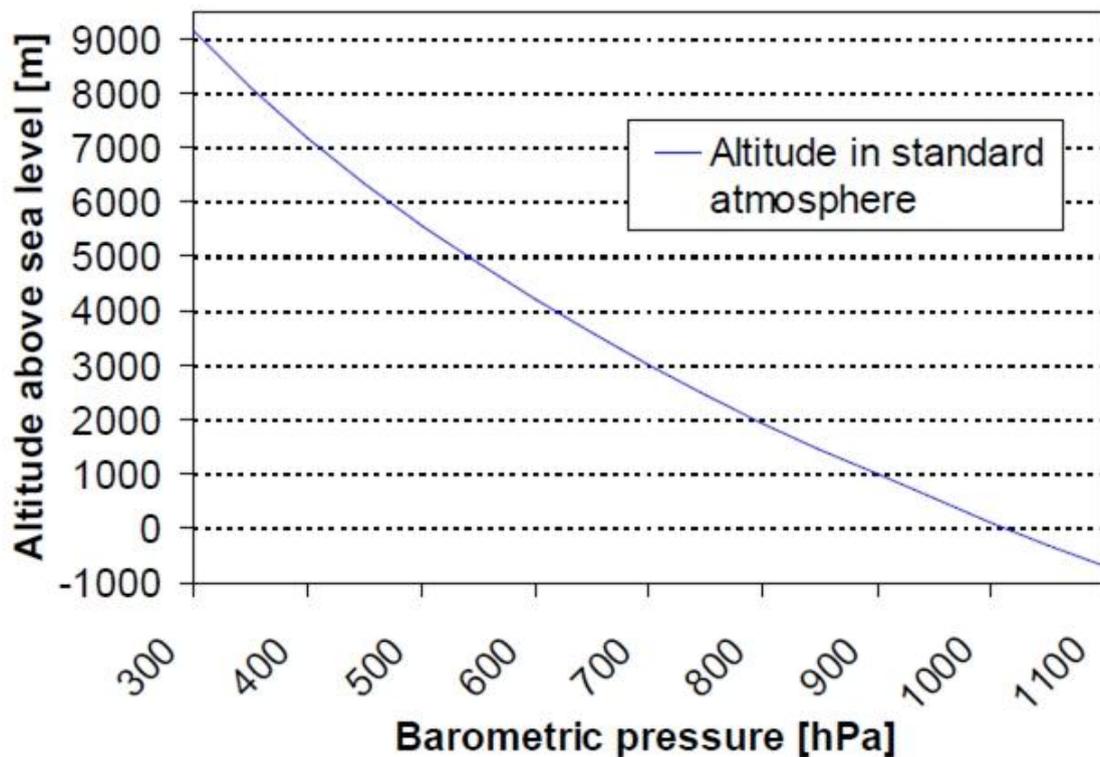
Here is the code :

```
1  #!/usr/bin/env python
2  #
3  # GrovePi Example for using the Grove - Barometer (High-
4  #
5  # The GrovePi connects the Raspberry Pi and Grove sensor.
6  #
7  # Have a question about this library? Ask on the forums
8  #
9  # This library is derived from the Arduino Library written
10 ''
11 ## License
12
13 The MIT License (MIT)
14
15 GrovePi for the Raspberry Pi: an open source platform for
16 Copyright (C) 2017 Dexter Industries
17
18 Permission is hereby granted, free of charge, to any person
19 of this software and associated documentation files (the
20 in the Software without restriction, including without limitation
21 to use, copy, modify, merge, publish, distribute, sublicense,
22 copies of the Software, and to permit persons to whom the
23 furnished to do so, subject to the following conditions:
24
25 The above copyright notice and this permission notice shall
26 all copies or substantial portions of the Software.
27
28 THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY
29 IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF
30 FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN
31 NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY
32 CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE
33 ARISING OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR
34 PERFORMANCE OF THE SOFTWARE.
35 ''
36 import hp206c
37 h= hp206c.hp206c()
38
```

```
39 ret=h.isAvailable()
40 if h.OK_HP20X_DEV == ret:
41     print("HP20x_dev is available.")
42 else:
43     print("HP20x_dev isn't available.")
44
45 temp=h.ReadTemperature()
46 pressure=h.ReadPressure()
47 altitude=h.ReadAltitude()
48 print("Temperature\t: %.2f C\nPressure\t: %.2f hPa\nAlti:
49
```

## References

The following is a reference graph plotting out the relationship between altitude above sea level and barometric pressure.



# Schematic Online Viewer



## Resources

- **[Eagle]** [Grove\\_Barometer\\_High-Accuracy\\_v1.0\\_sch\\_pcb Eagle File](https://files.seeedstudio.com/wiki/Grove-Barometer-High-Accuracy/res/Grove_Barometer_High-Accuracy_v1.0_sch_pcb.zip) [https://files.seeedstudio.com/wiki/Grove-Barometer-High-Accuracy/res/Grove\_Barometer\_High-Accuracy\_v1.0\_sch\_pcb.zip]

- **[Datasheet]** [HP206C Datasheet](https://files.seeedstudio.com/wiki/Grove-Barometer-High-Accuracy/res/HP206C_Datasheet.pdf)  
[https://files.seeedstudio.com/wiki/Grove-Barometer-High-Accuracy/res/HP206C\_Datasheet.pdf]
- **[Library]** [Github repository for Grove\\_Barometer\\_HP20x with arduino](https://github.com/Seeed-Studio/Grove_Barometer_HP20x) [https://github.com/Seeed-Studio/Grove\_Barometer\_HP20x]

## Projects

**Smart Crops:** Implementing IoT in Conventional Agriculture! Our mission with nature is to preserve it, designing and implementing technologies and monitoring methods with the help of IoT via Helium.



## Tech Support

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[<https://forum.seeedstudio.com/>].



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