Grove - Barometer Sensor (BMP180)

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Bazaar: http://www.seeedstudio.com/depot/Grove-Barometer-Sensor-BMP180-p-1840.html

Document Revision History

Revision	Date	Author	Description
1.0	Sep 21, 2015	Victor.He	Create file

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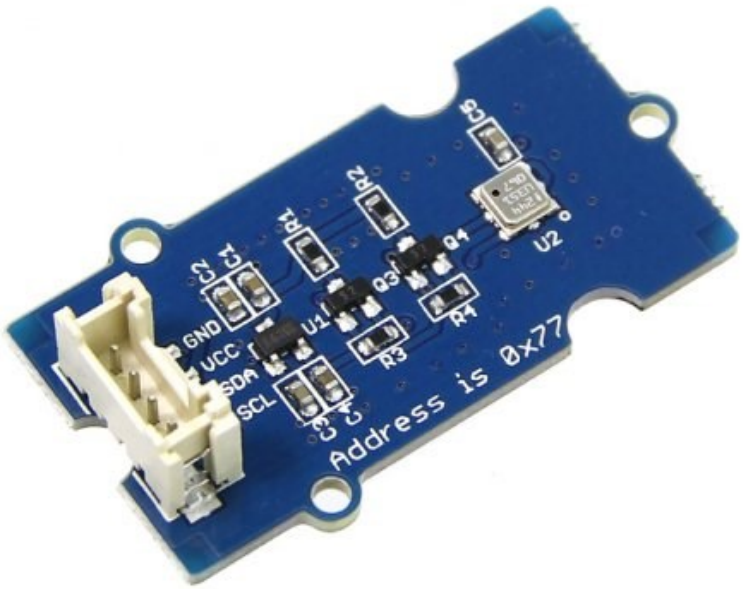
Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

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1. Introduction

This is a Grove module for the Bosch BMP180 high-precision, low-power digital barometer. The BMP180 offers a pressure measuring range of 300 to 1100 hPa with an accuracy down to 0.02 hPa in advanced resolution mode. It's based on piezo-resistive technology for high accuracy, ruggedness and long term stability. 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/Seeeduino or Seeeduino Stalker without modification. It is designed to be connected directly to a micro-controller via the I2C bus.



2. Features

- Digital two wire (I2C) interface
- Wide barometric pressure range
- Flexible supply voltage range
- Ultra-low power consumption
- Low noise measurement
- Factory-calibrated
- -40 to +85°C operational range, ±2°C temperature accuracy
- I2C address: 0x77

3. Application Ideas

- Enhancement of GPS navigation
- Indoor and outdoor navigation
- Leisure and sports
- Weather forecast
- Vertical velocity indication (rise/sink speed)

4. Specifications

Item	Min	Typical	Max	Unit
Voltage	3	5	5.5	VDC
Current	1.1	/	20	uA
Pressure Range	300	/	1100	hPa
Faster I2C data transfer	/	/	3.4	MHZ
Dimension	40.1*20.2*9.7			mm

5. Usage

5.1 With Arduino

Barometric condition is one of the criteria used to predict coming change in weather and deduce altitude above sea level. Here is a demo to show you how to read the barometric data from this Grove - Barometer Sensor (BMP180).

1. Connect it to IIC port of Seeeduino or Grove - Base Shield via a Grove cable. And connect Arduino to PC via a USB cable.
2. Download the library(the barometer library is shared by Grove - Barometer Sensor (BMP180) and Grove - Barometer Sensor(BMP085));Unzip it into the libraries file of Arduino IDE by the path: ..\arduino-1.0.1\libraries.
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.

```
/* Barometer demo V1.0
* Based largely on code by    Jim Lindblom
* Get pressure, altitude, and temperature from the BMP085.
* Serial.print it out at 9600 baud to serial monitor.
*
* By:http://www.seeedstudio.com
*/
#include "Barometer.h"
#include <Wire.h>
float temperature;
float pressure;
float atm;
float altitude;
Barometer myBarometer;
void setup(){
      Serial.begin(9600);
      myBarometer.init();

}

void loop()
{
      temperature = myBarometer.bmp085GetTemperature(myBarometer.bmp085ReadUT()); //Get the temperature, bmp085ReadUT MUST be called first
      pressure = myBarometer.bmp085GetPressure(myBarometer.bmp085ReadUP());//Get the temperature
      altitude = myBarometer.calcAltitude(pressure); //Uncompensated calculation - in Meters
      atm = pressure / 101325;
```

```
        Serial.print("Temperature: ");
        Serial.print(temperature, 2); //display 2 decimal places
        Serial.println("deg C");

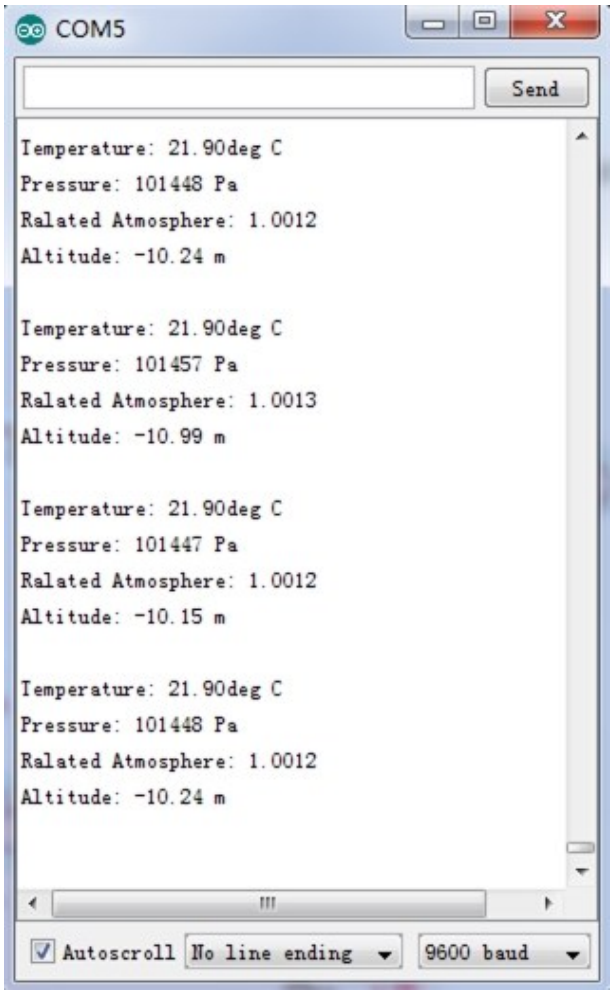
        Serial.print("Pressure: ");
        Serial.print(pressure, 0); //whole number only.
        Serial.println(" Pa");

        Serial.print("Ralated Atmosphere: ");
        Serial.println(atm, 4); //display 4 decimal places

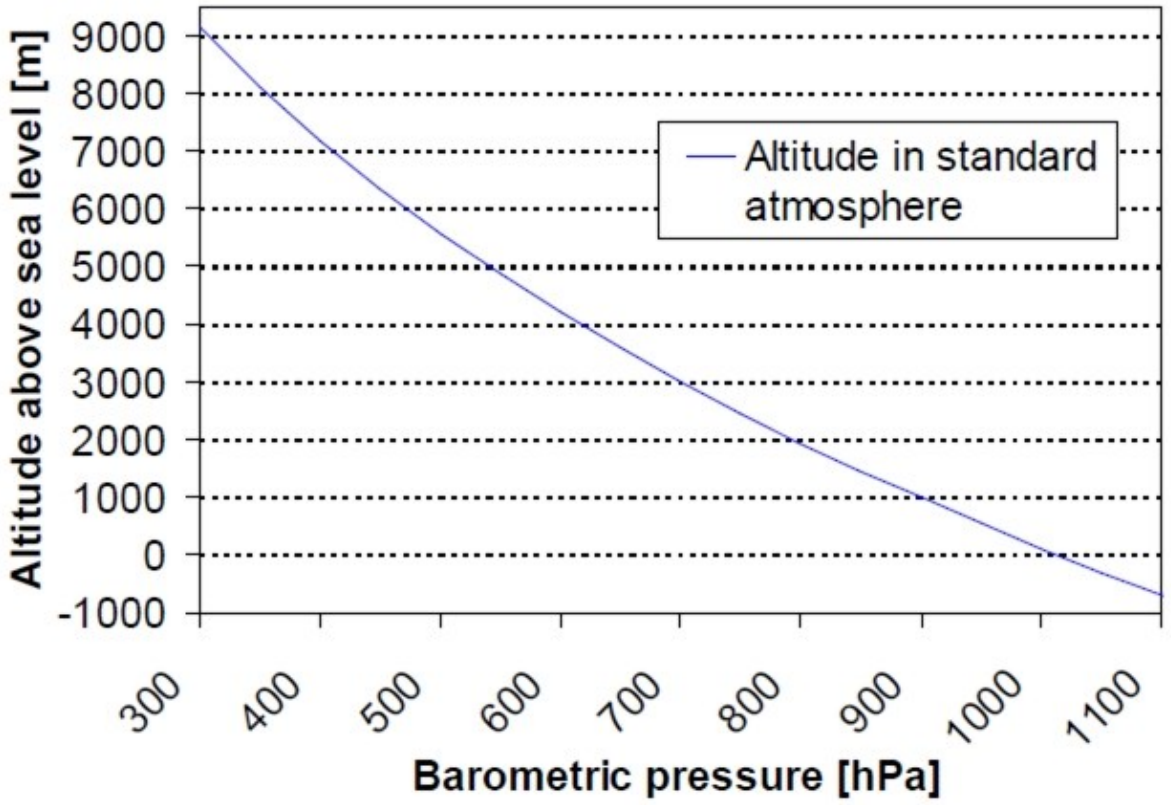
        Serial.print("Altitude: ");
        Serial.print(altitude, 2); //display 2 decimal places
        Serial.println(" m");

        Serial.println();

        delay(1000); //wait a second and get values again.
}
```



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



5.2 With Raspberry Pi

1. You should have got a raspberry pi and a grovepi or grovepi+.
2. You should have completed configuring the development enviroment, otherwise follow here.
3. Connection Plug the sensor to grovepi socket i2c-x(1~3) by using a grove cable.
4. Navigate to the demos' directory:

```
cd yourpath/GrovePi/Software/Python/grove_barometer/adafruit
```

To see the code

```
nano grove_i2c_barometic_sensor_example.py      # "Ctrl+x" to exit #
```

```
#!/usr/bin/python


import smbus
import RPi.GPIO as GPIO
#import grovepi
from grove_i2c_barometic_sensor import BMP085
```

```
# ===========================================================================
# Example Code
# ===========================================================================

# Initialise the BMP085 and use STANDARD mode (default value)
# bmp = BMP085(0x77, debug=True)
bmp = BMP085(0x77, 1)

# To specify a different operating mode, uncomment one of the following:
# bmp = BMP085(0x77, 0)    # ULTRALOWPOWER Mode
# bmp = BMP085(0x77, 1)    # STANDARD Mode
# bmp = BMP085(0x77, 2)    # HIRES Mode
# bmp = BMP085(0x77, 3)    # ULTRAHIRES Mode

rev = GPIO.RPI_REVISION
if rev == 2 or rev == 3:
bus = smbus.SMBus(1)
else:
bus = smbus.SMBus(0)

temp = bmp.readTemperature()

# Read the current barometric pressure level
pressure = bmp.readPressure()

# To calculate altitude based on an estimated mean sea level pressure
# (1013.25 hPa) call the function as follows, but this won't be very accurate
# altitude = bmp.readAltitude()

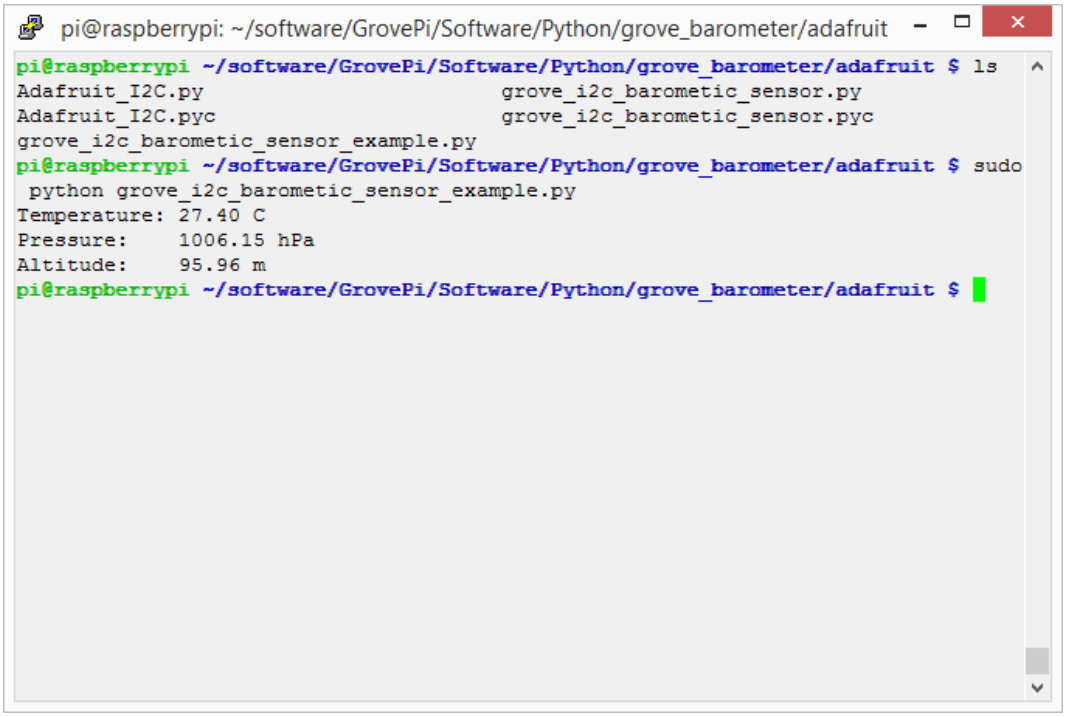
# To specify a more accurate altitude, enter the correct mean sea level
# pressure level.    For example, if the current pressure level is 1023.50 hPa
# enter 102350 since we include two decimal places in the integer value
altitude = bmp.readAltitude(101560)

print "Temperature: %.2f C" % temp
print "Pressure:       %.2f hPa" % (pressure / 100.0)
print "Altitude:       %.2f m" % altitude
```

5. Run the demo.

```
sudo python grove_i2c_barometic_sensor_example.py
```

6. Result


pi@raspberrypi: ~/software/GrovePi/Software/Python/grove_barometer/adafruit
pi@raspberrypi ~/software/GrovePi/Software/Python/grove_barometer/adafruit $ ls
Adafruit_I2C.py grove_i2c_barometic_sensor.py
Adafruit_I2C.pyc grove_i2c_barometic_sensor.pyc
grove_i2c_barometic_sensor_example.py
pi@raspberrypi ~/software/GrovePi/Software/Python/grove_barometer/adafruit $ sudo
python grove_i2c_barometic_sensor_example.py
Temperature: 27.40 C
Pressure: 1006.15 hPa
Altitude: 95.96 m
pi@raspberrypi ~/software/GrovePi/Software/Python/grove_barometer/adafruit $

6. Resources

Grove - Barometer Sensor(BMP180) Eagle File

Barometer_Sensor Library

BMP180 datasheet

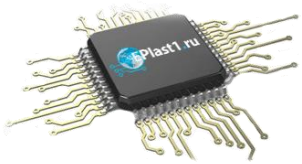
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.