

Reading Temperature and Pressure Data from BMP180 Sensor Using Raspberry Pi

Introduction:

The BMP180 sensor is a digital barometric pressure sensor that can measure temperature and atmospheric pressure accurately. It is widely used in weather monitoring systems and altitude measurement applications. Raspberry Pi, a small yet powerful computer, can interface with the BMP180 sensor to read and analyse environmental data. This manual provides a step-by-step guide to connecting and retrieving temperature and pressure data from the BMP180 sensor using a Raspberry Pi.

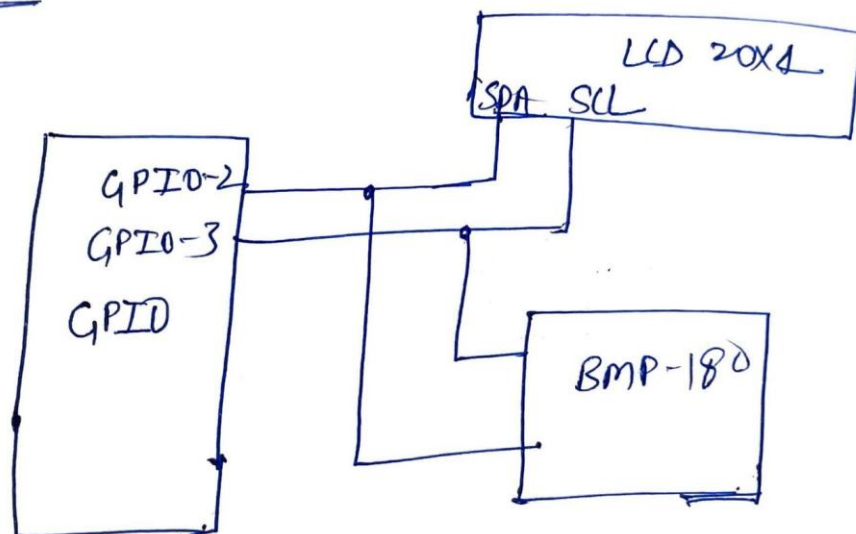
Components Required:

- Raspberry Pi (any model with GPIO support)
- BMP180 Sensor Module
- Jumper Wires
- Breadboard (optional)
- Power Supply for Raspberry Pi

Circuit Connection:

- Connect the VCC pin of the BMP180 sensor to the 3.3V pin of the Raspberry Pi.
- Connect the GND pin of the BMP180 sensor to the GND pin of the Raspberry Pi.
- Connect the SCL pin of the BMP180 sensor to the SCL pin (GPIO3) of the Raspberry Pi.
- Connect the SDA pin of the BMP180 sensor to the SDA pin (GPIO2) of the Raspberry Pi.
- Ensure all connections are secure before powering the Raspberry Pi.

BMP-180



Applications:

- Weather monitoring stations
- Altitude measurement in drones and aircraft
- Environmental sensing in IoT projects
- Indoor air pressure monitoring

Learnings:

- How to interface sensors with Raspberry Pi
- Basics of I2C communication protocol
- Reading and interpreting temperature and pressure data
- Practical implementation of environmental data collection

Conclusion:

Using a BMP180 sensor with a Raspberry Pi provides a simple yet effective way to monitor environmental conditions. Understanding sensor interfacing and data collection enhances skills in IoT and embedded systems. This project is a great starting point for those interested in real-world applications of sensor technology in weather monitoring and automation.

Outcome:



Program:

```
import time
import board
import busio
import adafruit_bmp280
from RPLCD.i2c import CharLCD

# Initialize I2C Bus
i2c = busio.I2C(board.SCL, board.SDA)

# Initialize BMP180/BMP280 Sensor
bmp = adafruit_bmp280.Adafruit_BMP280_I2C(i2c, address=0x77) # BMP180/BMP280 uses 0x77

# Initialize LCD
lcd = CharLCD('PCF8574', 0x27)

def update_display(temp, pressure):

    """Update the LCD with temperature and pressure readings."""
    lcd.clear()
    lcd.cursor_pos = (0, 0)
    lcd.write_string("BMP180 Sensor")
    lcd.cursor_pos = (2, 0)
    lcd.write_string(f"T: {temp:.2f} C")
```

```
lcd.cursor_pos = (3, 0)
```

```
lcd.write_string(f"P: {pressure:.2f} hPa")
```

```
try:
```

```
    while True:
```

```
        temperature = bmp.temperature # Read temperature (°C)
```

```
        pressure = bmp.pressure # Read pressure (hPa)
```

```
        update_display(temperature, pressure) # Update LCD
```

```
        time.sleep(1)
```

```
except KeyboardInterrupt:
```

```
    lcd.clear()
```

```
    print("Program Stopped")
```