

Code:

```
//define baro prs sensor
#include <Adafruit_BMP085.h>
Adafruit_BMP085 bmp;
int systolic, diastolic, alert;
long temperature, pressure;

#define alarm D3
#define trig D7
#define echo D8
long time1;
long distance;

long val1, val2, val3, val4, val5, val6;

#include <Wire.h>
#include "MAX30100_PulseOximeter.h"
#define REPORTING_PERIOD_MS 1000
PulseOximeter pox;
uint32_t tsLastReport = 0;
void onBeatDetected()    // a loop to Print "beat" when a beat is detected
{
  Serial.println("Beat!");  // print statement
}
```

```

#include <ESP8266WiFi.h>    //include the necessary libraries to the program (ESP
library)
#include <WiFiClient.h>      // wifi communication library
#include <ThingSpeak.h>      // thingspeak library
const char* ssid = "OnePlus7";    // Your Network SSID (Your Hotspot name) to
connect to wifi
const char* password = "00000000";    // Your Network Password (Your Hotspot
password)

WiFiClient client;           // Initialization for wifi communication to specific IP
address(Your Thingspeak account)

unsigned long myChannelNumber = 234117;    // Your Thingspeak Channel Number
(Without Brackets)
const char * myWriteAPIKey = "H65RHJGZ95B6T89H"; // Your Thingspeak Write
API Key

void setup()
{
  Serial.begin(9600);
  pinMode(trig, OUTPUT);
  pinMode(echo, INPUT);    //DEFINE ECHO PIN AS INPUT
  pinMode(alarm, OUTPUT);  //DEFINE alarm AS OUTPUT
  delay(10);

```

```

    WiFi.begin(ssid, password);    //Connect to WiFi network
    ThingSpeak.begin(client);      // begin communication through the network to
    thingspeak

```

```

//          ~~~~~INITIALIZE          PRESSURE
SENSOR~~~~~

```

```

if (!bmp.begin())
{
    Serial.println("Could not find a valid BMP085 sensor, check wiring!");
    while (1) {}
}

```

```

//          ~~~~~INITIALIZE          PULSE          OXIMETER
SENSOR~~~~~

```

```

Serial.println("Initializing pulse oximeter..");

```

```

if (!pox.begin())
{
    Serial.println("FAILED");
    for(;;);
}

```

```

else

```

```

{
    Serial.println("SUCCESS");
}

```

```

pox.setIRLedCurrent(MAX30100_LED_CURR_7_6MA);

```

```

    pox.setOnBeatDetectedCallback(onBeatDetected);
}

void loop() {
//  ~~~~~HEART RATE AND OXYGEN LEVEL
MEASUREMENT~~~~~

    pox.update();
    if (millis() - tsLastReport > REPORTING_PERIOD_MS)
    {
        val4 = pox.getHeartRate();

        val5 = pox.getSpO2();
        val5 = constrain(val5,0,100);
        tsLastReport = millis();

// Make sure to call update as fast as possible

//  ~~~~~TEMPERATURE
MEASUREMENT~~~~~

        temperature = bmp.readTemperature();
        val1 = ((temperature*1.8)+46);

//  ~~~~~PRESSURE
MEASUREMENT~~~~~

        pressure = bmp.readPressure();

```

```
val2 =map(pressure,100943,101200,90,120); //systolic
```

```
val3 = map(pressure,100943,101200,60,89); //diastolic
```

```
// ~~~~~DISTANCE  
MEASUREMENT~~~~~
```

```
digitalWrite(trig, LOW);  
delayMicroseconds(2);  
digitalWrite(trig, HIGH);  
delayMicroseconds(10);  
digitalWrite(trig, LOW);
```

```
time1 = pulseIn(echo, HIGH);  
distance = time1 / 58;  
val6 = map(distance,3,20,0,20);  
val6 = constrain(val6,0,20);
```

```
// ~~~~~SEND TO CLOUD LOGIC - IOT  
DISPLAY~~~~~
```

```
ThingSpeak.writeField(myChannelNumber, 1,val1, myWriteAPIKey); //write the  
temperature value to ThingSpeak in channel 1
```

```
ThingSpeak.writeField(myChannelNumber, 2,val2, myWriteAPIKey); //write the
```

temperature value to ThingSpeak in channel 2

ThingSpeak.writeField(myChannelNumber, 3,val3, myWriteAPIKey); //write the temperature value to ThingSpeak in channel 3

ThingSpeak.writeField(myChannelNumber, 4,val4, myWriteAPIKey); //write the temperature value to ThingSpeak in channel 4

ThingSpeak.writeField(myChannelNumber, 5,val5, myWriteAPIKey); //write the temperature value to ThingSpeak in channel 5

ThingSpeak.writeField(myChannelNumber, 6,val6, myWriteAPIKey); //write the temperature value to ThingSpeak in channel 6

ThingSpeak.writeField(myChannelNumber, 7,alert, myWriteAPIKey); //write the temperature value to ThingSpeak in channel 7

// ~~~~~SERIAL PRINT LOGIC - LOCAL
DISPLAY~~~~~

Serial.print(" Temperature = ");

Serial.print(val1);

Serial.print(" F");

Serial.print(" Systolic = ");

Serial.print(val2);

Serial.print(" Diastolic = ");

Serial.print(val3);

Serial.print(" Heart beat (bpm):");

Serial.print(val4);

Serial.print(" Oxygen (%):");

Serial.print(val5);

Serial.print(" Distance (Cm):");

```
Serial.print(val6);
```

```
Serial.print(" Alert:");
```

```
Serial.print(alert);
```

```
Serial.println();
```

```
}// end of pulse loop
```

```
// ~~~~~ALERT LOGIC~~~~~
```

```
// if temp greater than 100
```

```
// if systolic pressure less than 90
```

```
// if systolic pressure greater than 120
```

```
// if diastolic pressure less than 60
```

```
// if diastolic pressure greater than 89
```

```
// if heart rate less than 50
```

```
// if heart rate greater than 95
```

```
// if oxygen level less than 95
```

```
if((val1>=100)|| (val2<90)|| (val2>120)|| (val3<60)|| (val3>89)|| (val4<50)|| (val4>95)|| (val5<95))
```

```
{
```

```
digitalWrite(alarm,HIGH);
```

```
alert = 1;
```

```
}
```

```
else
```

```
{
```

```
digitalWrite(alarm,LOW);
```

```
alert = 0;
```

```
}
```

```
} // end of void loop
```