

Pulse Sensor Module(SE050)



1 Introduction

Pulse sensor also called Heart rate sensor, which can be really useful whether you're designing an exercise routine, studying your activity or anxiety levels or just want your shirt to blink with your heart beat. The problem is that heart rate can be difficult to measure. Luckily, the Pulse Sensor Amped can solve that problem! The Pulse Sensor Amped is a plug-and-play heart-rate sensor for Arduino. It can be used by students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heart-rate data into their projects. It essentially combines a simple optical heart rate sensor with amplification and noise cancellation circuitry making it fast and easy to get reliable pulse readings. Also, it sips power with just 4mA current draw at 5V so it's great for mobile applications. Simply clip the Pulse Sensor to your earlobe or fingertip and plug it into your 3 or 5 Volt Arduino and you're ready to read heart rate! The 24" cable on the Pulse Sensor is terminated with standard male headers so there's no soldering required. Of course Arduino example code is available as well as a Processing sketch for visualizing heart rate data

Specification

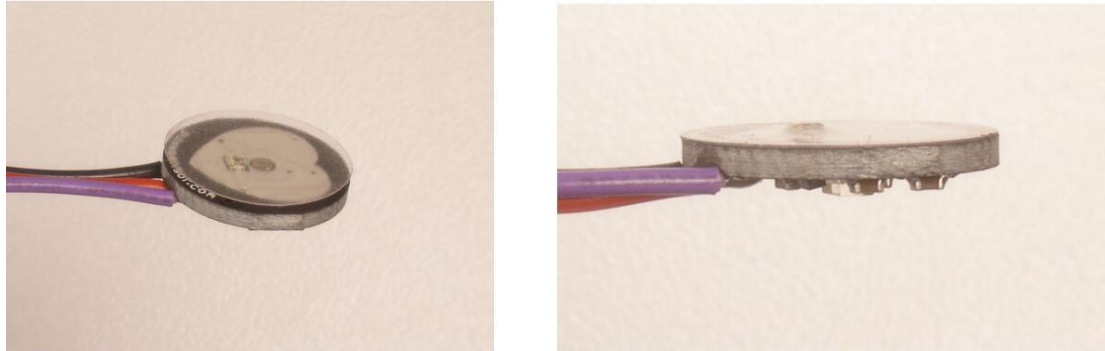
- Operation voltage: 5V
- With 3Pin Jumper
- Size:12*12mm(without jumper)

2 Pinout

Pin	Description
S	Signal pin
+	Power
-	Ground

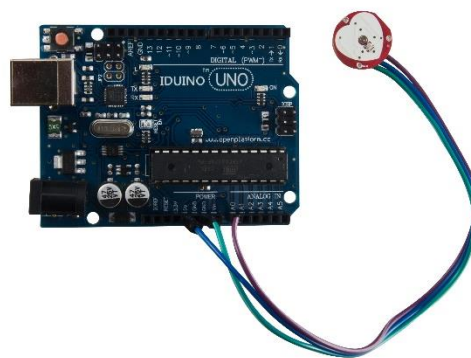
3.Example

In order to avoid your finger or skin contact directly to this module, you need use a thin film of vinyl to seal the sensor side, like the following picture:



Using this simple example, if you hold this pulse sensor module in your fingertip, the LED13 will blinking with your heartbeat. The connection as the following instruction:

Arduino UNO pin	Pulse sensor pin
A0	S
Vcc	+
Gnd	-



Example Code

```
*****Code Begin*****
```

```
// VARIABLES
```

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```
int pulsePin = 0;           // Pulse Sensor purple wire connected
to analog pin 0
int blinkPin = 13;         // pin to blink led at each beat
int fadePin = 5;           // pin to do fancy classy fading blink
at each beat
int fadeRate = 0;         // used to fade LED on with PWM on

volatile int BPM;          // used to hold the pulse rate
volatile int Signal;      // holds the incoming raw data
volatile int IBI = 600;   // holds the time between beats, the
Inter-Beat Interval
volatile boolean Pulse = false; // true when pulse wave is high,
false when it's low
volatile boolean QS = false; // becomes true when Arduino finds
a beat.

void setup(){
  pinMode(blinkPin,OUTPUT); // pin that will blink to your
heartbeat!
  pinMode(fadePin,OUTPUT);  // pin that will fade to your
heartbeat!
  Serial.begin(115200);     // we agree to talk fast!
  interruptSetup();        // sets up to read Pulse Sensor
}

void loop(){
  sendDataToProcessing('S', Signal); // send Processing the raw Pulse
Sensor data
  if (QS == true){         // Quantified Self flag is true
when arduino finds a heartbeat
    fadeRate = 255;        // Set 'fadeRate' Variable to
255 to fade LED with pulse
    sendDataToProcessing('B',BPM); // send heart rate with a 'B'
prefix
    sendDataToProcessing('Q',IBI); // send time between beats with
a 'Q' prefix
    QS = false;           // reset the Quantified Self
flag for next time
  }
}
```

```
ledFadeToBeat();

delay(20);                // take a break
}

void ledFadeToBeat(){
    fadeRate -= 15;                // set LED fade value
    fadeRate = constrain(fadeRate,0,255); // keep LED fade value from
going into negative numbers!
    analogWrite(fadePin,fadeRate); // fade LED
}

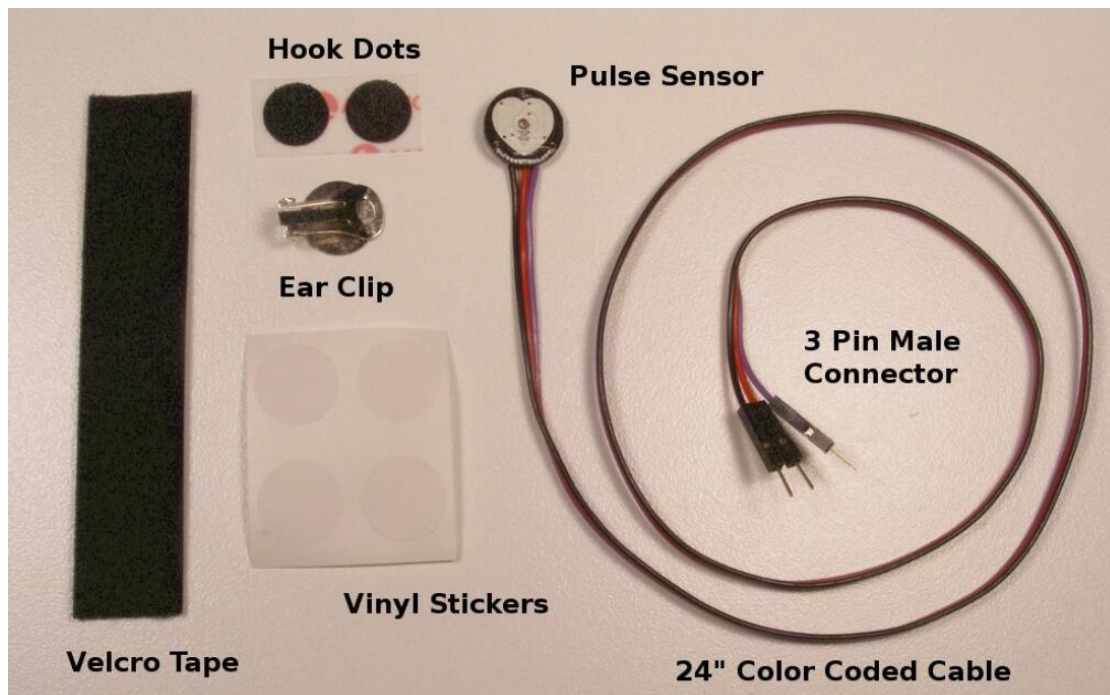
void sendDataToProcessing(char symbol, int data ){
    Serial.print(symbol);                // symbol prefix tells
Processing what type of data is coming
    Serial.println(data);                // the data to send culminating
in a carriage return
}
*****Code End*****
```

4. Extension learning

We strongly advise that you DO NOT connect the Pulse Sensor to your body while your computer or arduino is being powered from the mains AC line. That goes for charging laptops and DC power supplies. Please be safe and isolate yourself from from the power grid, or work under battery power.

Usually, people experience the fun of this module, they use a pulse sensor kit, like the following picture:

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Even you seal the back slide of this module or attaching this to your ear clip, More fun we can explore.