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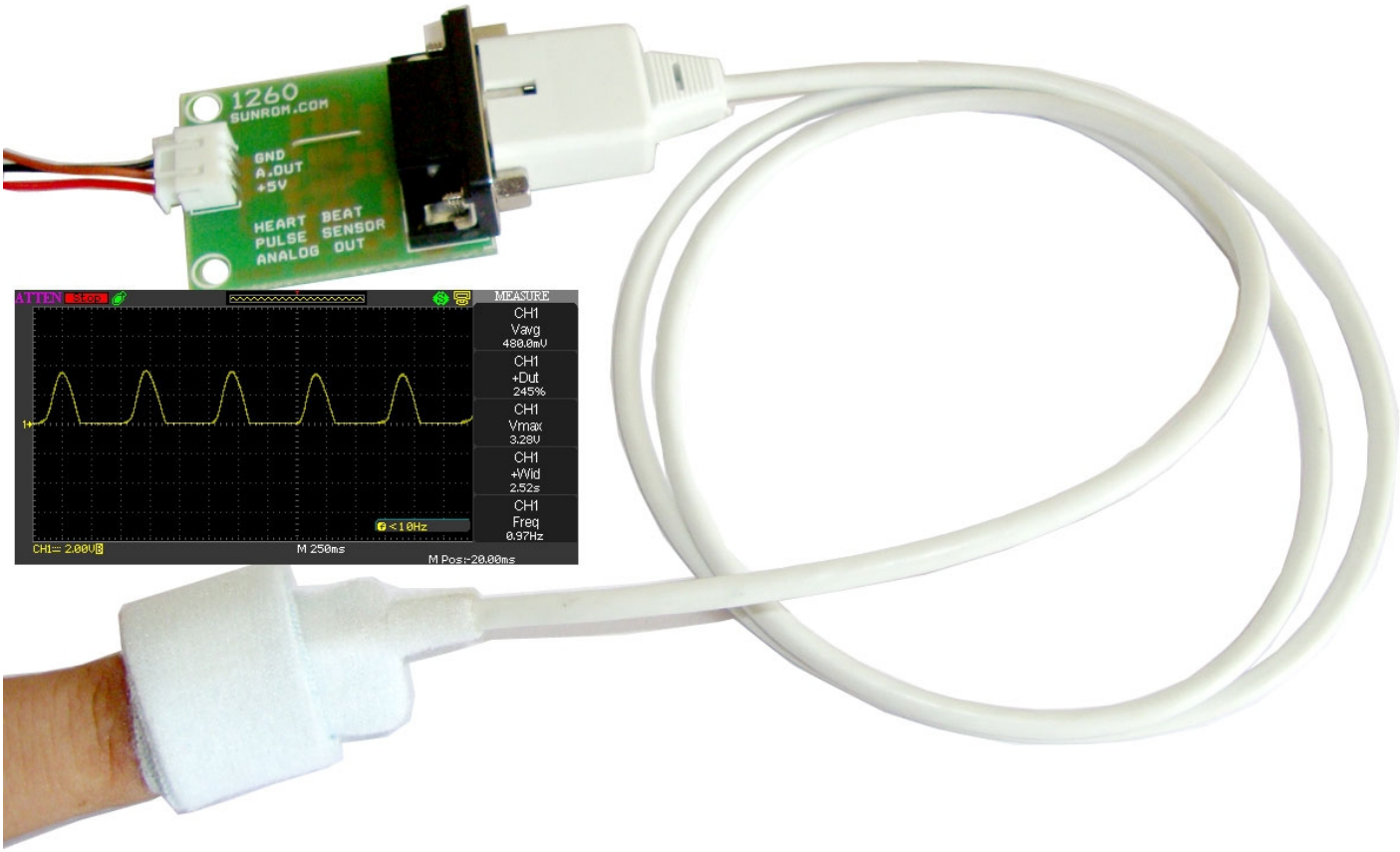
Heartbeat Pulse Sensor - Analog Out

Attach to finger and get Analog out from the sensor based on heart beat pulse. You can read the analog output with microcontroller ADC and then plot it or calculate readings like heart beat per minute. Simple to use and accurate results.



This analog output can be connected to microcontroller with ADC pin directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

Applications

- Digital Heart Rate monitor
- Patient Monitoring System
- Bio-Feedback control of robotics and applications

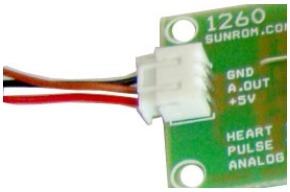
Specification

Parameter	Value
Operating Voltage	+5V DC regulated
Operating Current	100 mA
Output Data Level	5V TTL level
Heart Beat detection	Analog Out
Light source	660nm Super Red LED
Detector	Photo Diode

Pin Details

Board has 3-pin connector for using the sensor. Details are marked on PCB as below.

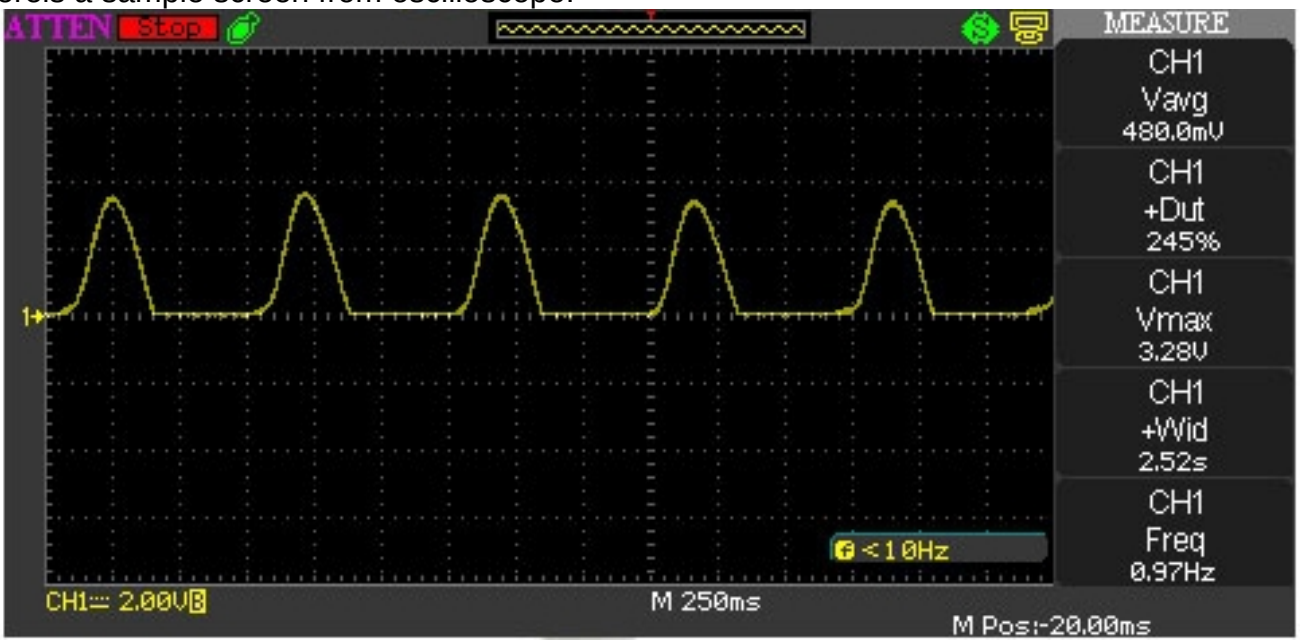
Pin	Name	Details
1	+5V	Power supply Positive input
2	A.OUT	Analog voltage out (0-5V range)
3	GND	Power supply Ground



Using the Sensor

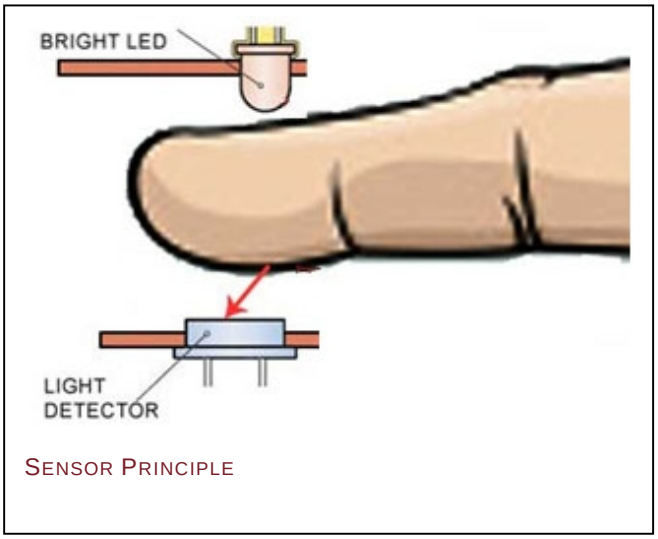
- Connect regulated DC power supply of 5 Volts. Black wire is Ground, Next middle wire is Brown which is output and Red wire is positive supply. These wires are also marked on PCB.
- To test sensor you need power the sensor by connect two wires +5V and GND. The output wire can go to either an oscilloscope or a MCU with ADC pin sending adc data on PC then getting it displayed using a custom software.
- Attach the strap to your finger, The RED LED on nail side. and you can view the beat analog output changing on each heart beat.
- The output is 0-5V analog out for each beat and can be given directly to microcontroller ADC pin for interfacing applications.

Hereis a sample screen from oscilloscope.



Working

The sensor consists of a super bright red LED and light detector. The LED needs to be super bright as the maximum light must pass spread in finger and detected by detector. Now, when the heart pumps a pulse of blood through the blood vessels, the finger becomes slightly more opaque and so less light reached the detector. With each heart pulse the detector signal varies. This variation is converted to electrical pulse. This signal is amplified through an amplifier which outputs analog voltage between 0 to +5V logic level signal.



SENSOR PRINCIPLE

Following graph shows target pulse rates for people aged between 20 and 70. The target range is the pulse rate needed in order to provide suitable exercise for the heart. For a 25-year old, this range is about 140-170 beats per minute while for a 60-year old it is typically between 115 and 140 beats per minute.