

## Infrared Thermometer Sensor

### Introduction

An Infrared thermometer is a sensor that measures temperature, like a thermometer, but but can do so without physically touching the object. It gets the temperature from the thermal radiation or black body radiation emitted from the target object.

### Source

I got the sensor on Spark Fun a few years ago and it cost approximately \$20. There are a variety of versions that range in price to I think around \$60 or more, but the main difference is that some have a more narrow field of

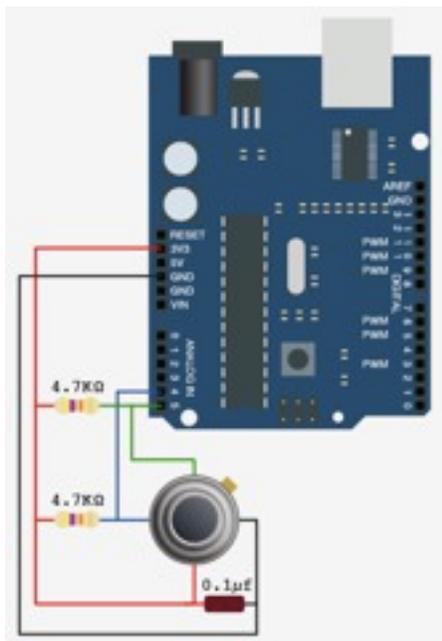
### Applications

This sensor is commonly used for applications where touch is unsafe or unwanted for temperature measurement. It can be also useful for an application where its is more convenient to sense temperature from a distance.

### Datasheet:

<https://docs.google.com/viewer?url=http://www.sparkfun.com/datasheets/Sensors/Temperature/SEN-09570-datasheet-3901090614M005.pdf>

### Microcontroller Connection:



### Code Example:

```
#include <i2cmaster.h>
```

```
void setup(){
```

```

    Serial.begin(9600);
    Serial.println("Setup...");

    i2c_init(); //Initialise the i2c bus
    PORTC = (1 << PORTC4) | (1 << PORTC5); //enable pullups
}

void loop(){
    int dev = 0x5A<<1;
    int data_low = 0;
    int data_high = 0;
    int pec = 0;

    i2c_start_wait(dev+I2C_WRITE);
    i2c_write(0x07);

    // read
    i2c_rep_start(dev+I2C_READ);
    data_low = i2c_readAck(); //Read 1 byte and then send ack
    data_high = i2c_readAck(); //Read 1 byte and then send ack
    pec = i2c_readNak();
    i2c_stop();

    //This converts high and low bytes together and processes temperature, MSB is a
    error bit and is ignored for temps
    double tempFactor = 0.02; // 0.02 degrees per LSB (measurement resolution of the
    MLX90614)
    double tempData = 0x0000; // zero out the data
    int frac; // data past the decimal point

    // This masks off the error bit of the high byte, then moves it left 8 bits and adds
    the low byte.
    tempData = (double)((((data_high & 0x007F) << 8) + data_low));
    tempData = (tempData * tempFactor)-0.01;

    float celcius = tempData - 273.15;
    float fahrenheit = (celcius*1.8) + 32;

    Serial.print("Celcius: ");
    Serial.println(celcius);

    Serial.print("Fahrenheit: ");
    Serial.println(fahrenheit);

    delay(1000); // wait a second before printing again
}

```

### Personal Application:

I think it would be cool to use it in a way that reacts to the temperature of other people or objects around you. Its could be useful to sense another persons body temperature without invading their personal space.

### Reverences:

<https://www.sparkfun.com/products/9570>

[http://wiki.bildr.org/index.php/Infrared\\_Thermometer - MLX90614](http://wiki.bildr.org/index.php/Infrared_Thermometer_-_MLX90614)  
<http://bildr.org/2011/02/mlx90614-arduino/>  
[http://en.wikipedia.org/wiki/Infrared\\_thermometer](http://en.wikipedia.org/wiki/Infrared_thermometer)

## Components Report

### Introduction

Paragraph or two introducing the sensor. Write in Layperson's terms, define technical terms you need to use.

### Source

Choose an input and output from the hybrid lab or purchase one locally.

Where to get your component, how much it costs.

### Applications

What is this commonly used for?

If out there, find at least 4 interactive projects that use this, wearable or e-textile if possible.

Link to any soft circuit versions.

### Datasheet

Put a link to the datasheet and the pin diagram.

Link to any additional items you may need to operate this sensor, for instance a breakout board.

### Microcontroller Connection

Explain and illustrate how to connect the component to a microcontroller or computer.

fritzing.org

### Code Example

Give the code you used to develop the example with.

### Typical Behavior

Describe the behavior when you use it to sense something and what the output's limitations are. Note any peculiarities that you had to work around. Graphs are most useful

here.

### Personal Application

Describe how you would use this component, what are creative ways and context that break the common uses.

### References

Add links to any reference materials you used to learn about your sensor.