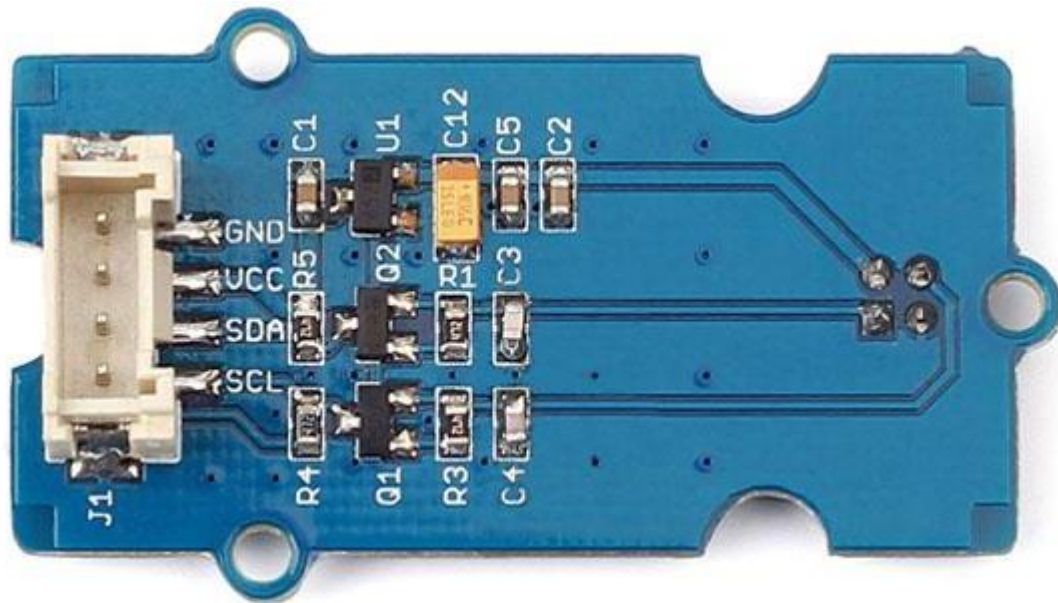# Grove - Digital Infrared Temperature Sensor

The Digital Infrared temperature sensor is a non-contact temperature measurement module which bases on MLX90615. Both the IR sensitive thermopile detector chip and the signal conditioning chip are integrated in the same package. This module communicates with Arduino using SMBus, up to 127 sensors can be read via common 2 wires. Thanks to the module's low noise amplifier, 16-bit ADC and powerful DSP unit, it can achieved a high accuracy of 1℃ over wide temperature rage and a high measurement resolution of 0.02℃.

Specifications

Item	Min	Typical	Max	Unit
Voltage	2.6	3	5	V
Current		1.4	1.5	mA
Ambient Temperature Range	-40 - 85			℃
Object Temperature Range	-40 - 115			℃
Dimension	20x40x9.6			mm

Platforms Supported

Arduino	Raspberry Pi	BeagleBone	Wio	LinkIt ONE

Caution

The platforms mentioned above as supported is/are an indication of the module's hardware or theoritical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

Hardware Overview
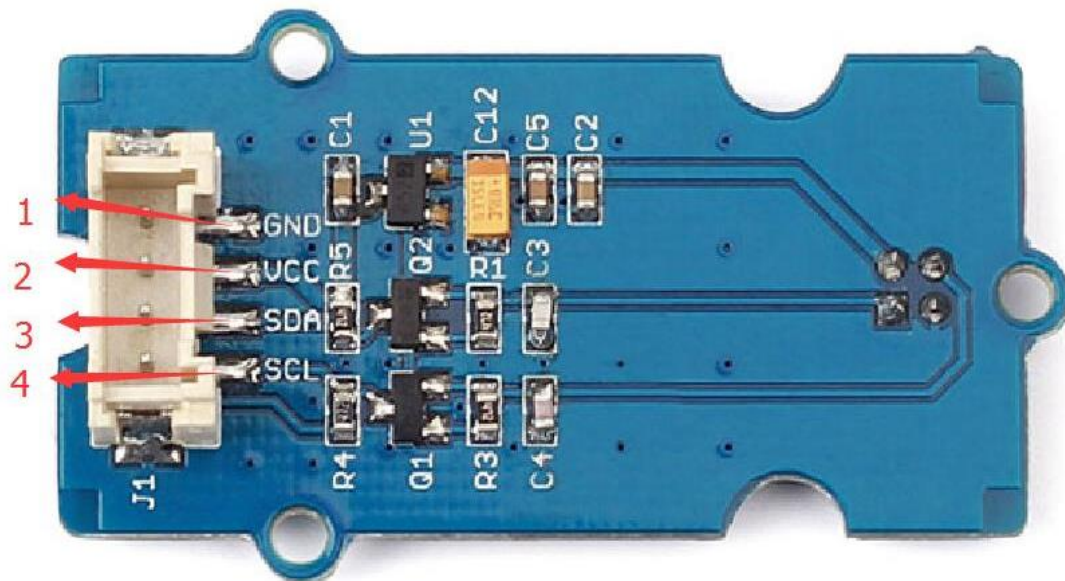
Pin Number	Name	Type	Function Description
1	GND	-	Signal ground
2	VCC	in	Positive Power Supply Input Terminal(3.3V or 5V)
3	SDA	in/out	I2C data input/output
4	SCL	in	I2C CLK

Getting Started

Play With Arduino

We provide an example here to show you how to use this sensor to measure the temperature of the target which is in front of the sensor, and print the result on the serial monitor.

Note

If this is the first time you work with Arduino, we firmly recommend you to see Getting Started with Arduino before the start.

Hardware

Hardware components:

Seeeduino V4.2	Base Shield	Grove - Ultrasonic Ranger

- **Step 1.** Plug Grove - Digital Infrared Temperature Sensor into port **D2** of Grove-Base Shield.
- **Step 2.** Plug Grove - Base Shield into Seeeduino.
- **Step 3.** Connect Seeeduino to PC via a USB cable.
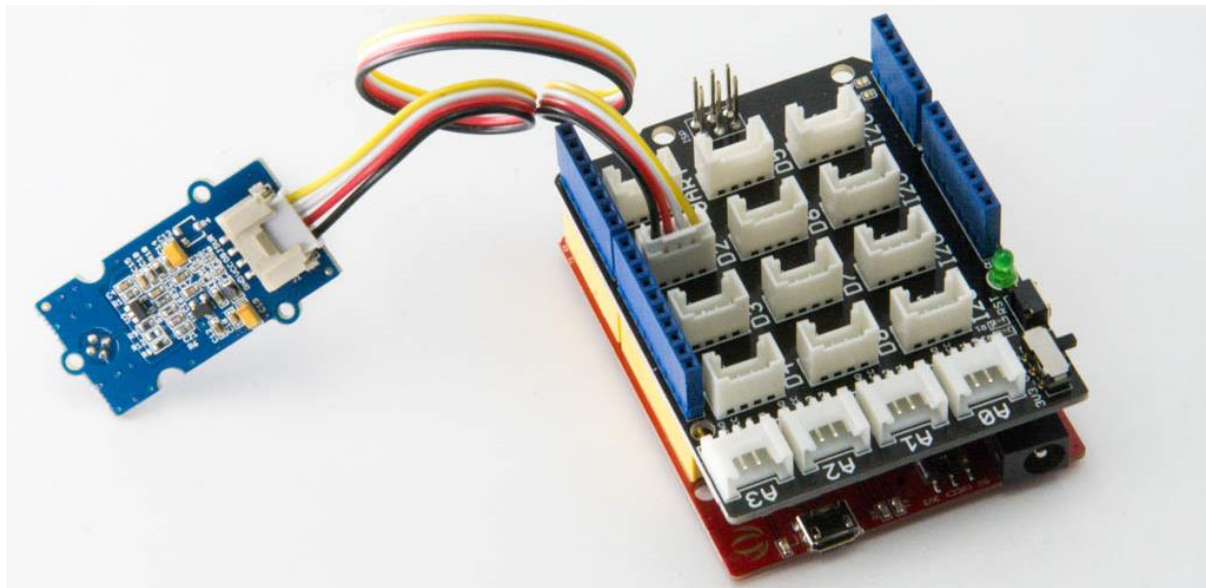
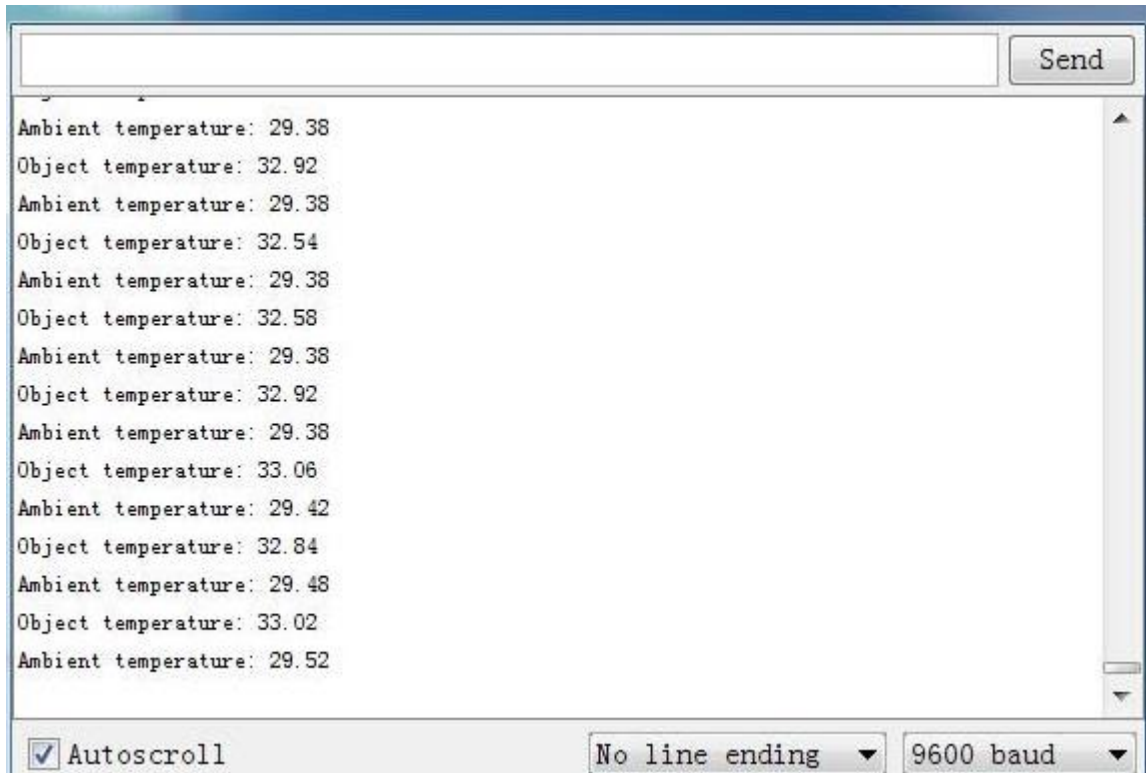| Seeeduino	Grove-Ultrasonic Ranger
5V	Red
GND	Black
SDA	White
SCL	Yellow

Software

- **Step 1.** Download the library and demo code Digital_Infrared_Temperature_Sensor_MLX90615.
- **Step 2.** Refer to How to install library to install library for Arduino.
- **Step 3.** Open the demo code directly by the path:

File -> Examples -> Digital_Infrared_Temperature_Sensor_MLX90615 -> MLX90615Soft. As the following picture shown:
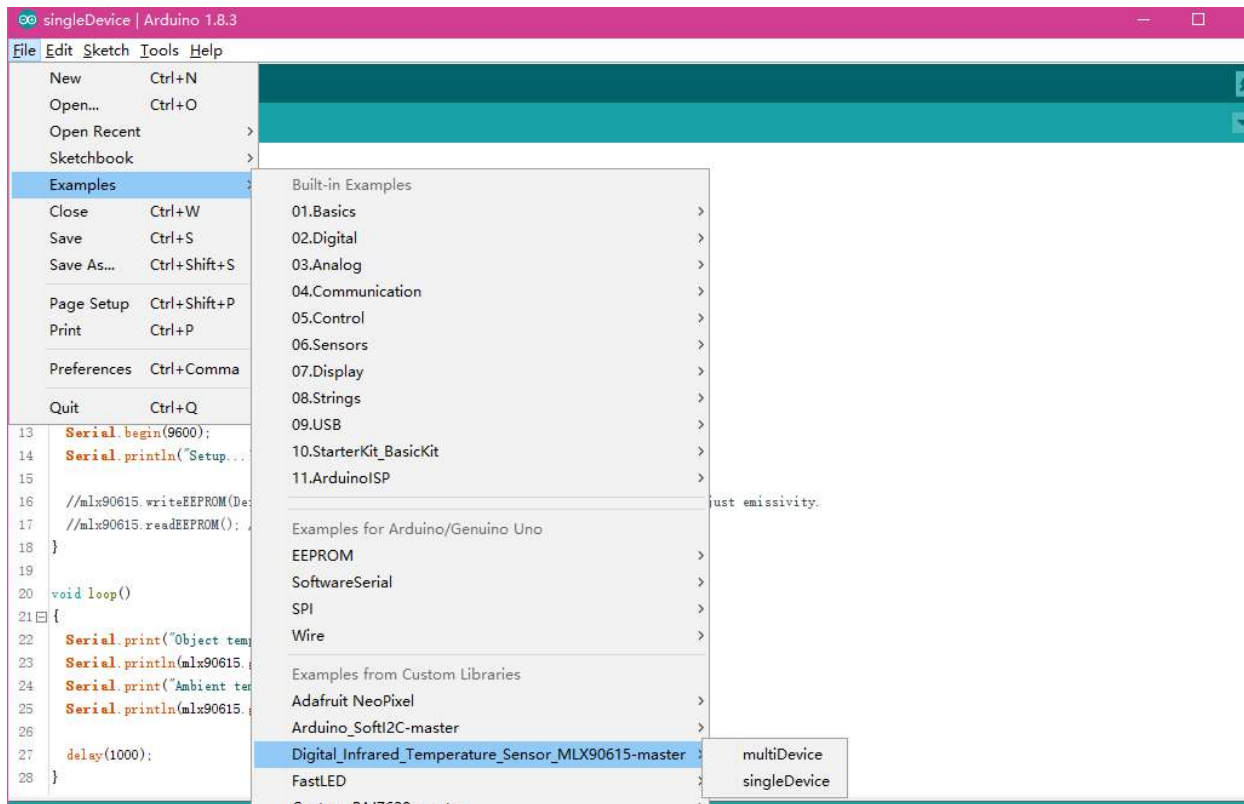
Since the sensor is factory calibrated with the digital SMBus compatible interface enabled, but the library is based on a soft i2c library, so you can use any digital pins on any AVR chip to drive the **SDA** and **SCL** lines. We use **D2** as the **SCL** pin and **D3** as the **SDA** pin in this demo code. You can use other port as long as you modify the code with matched pins.

- **Step 4.** Upload the code into Arduino. If you do not know how to upload the code, please check how to upload code.
- **Step 5.** Click **Tool -> Serial Monitor** to start up the Serial Monitor. And you will see the result.

```
Ambient temperature: 29.38
Object temperature: 32.92
Ambient temperature: 29.38
Object temperature: 32.54
Ambient temperature: 29.38
Object temperature: 32.58
Ambient temperature: 29.38
Object temperature: 32.92
Ambient temperature: 29.38
Object temperature: 33.06
Ambient temperature: 29.42
Object temperature: 32.84
Ambient temperature: 29.48
Object temperature: 33.02
Ambient temperature: 29.52
```

Send

☑ Autoscroll   No line ending ▼   9600 baud ▼

Now, you can measure the temperature with this sensor. Ambient temperature is the MLX90615 package temperature and Object temperature is the object target temperature. According to our experiment, when you place the sensor in the normal indoor temperature, and ensure that there is nothing source of heat in front of the sensor's 1M scope. The Object temperature will approximately equal to Ambient temperature. When measuring the Object temperature, you should ensure the object is as close as possible whit the sensor, but do not touch the surface of the sensor, we recommend the distance is less than 3cm. Wish you have a fun try.

Tip

More details about Grove modules please refer to Grove System

Resources

- **[Zip]** Grove Digital Infrared Temperature Sensor v1.0 eagle file.zip
- **[PDF]** MLX90615.pdf
- **[Code]** Demo Code

Tech Support

Please submit any technical issue into our forum or drop mail to techsupport@seeed.cc.