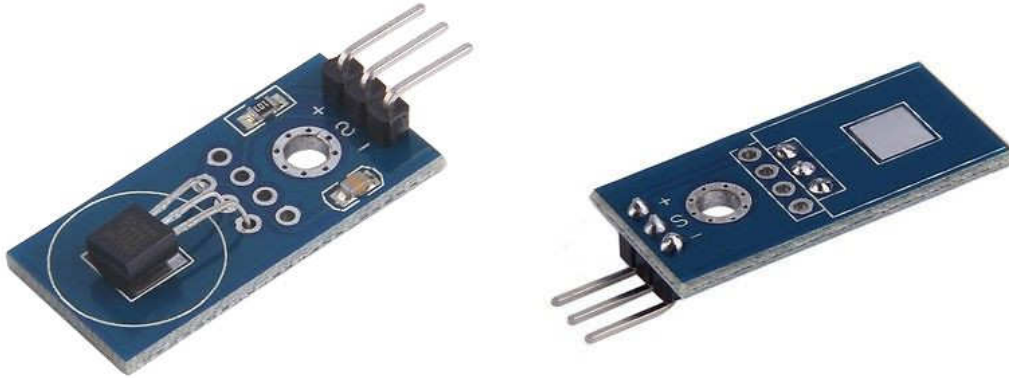




## DS18B20 Temperature Sensor Module

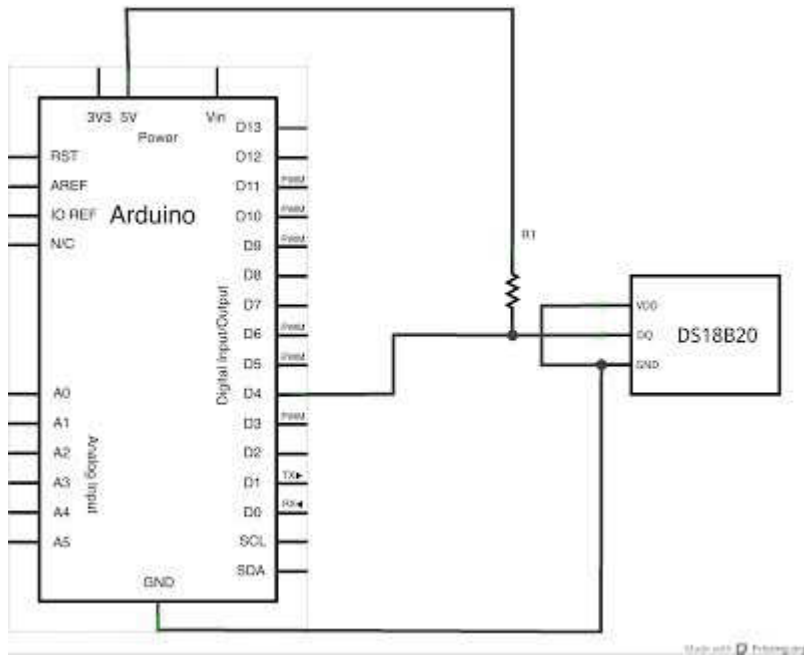


### **Introduction:**

These 3-wire digital temperature sensors are fairly precise ( $\pm 0.5^{\circ}\text{C}$  over much of the range) and can give up to 12 bits of precision from the onboard digital-to-analog converter. They work great with any microcontroller using a single digital pin, and you can even connect multiple ones to the same pin, each one has a unique 64-bit ID burned in at the factory to differentiate them. Usable with 3.0-5.0V systems.

### **Technical specs:**

- Unique 1-Wire® Interface Requires Only One Port Pin for Communication
- Reduce Component Count with Integrated Temperature Sensor and EEPROM
  - Measures Temperatures from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  ( $-67^{\circ}\text{F}$  to  $+257^{\circ}\text{F}$ )
  - $\pm 0.5^{\circ}\text{C}$  Accuracy from  $-10^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
  - Programmable Resolution from 9 Bits to 12 Bits
  - No External Components Required
- Parasitic Power Mode Requires Only 2 Pins for Operation (DQ and GND)
- Simplifies Distributed Temperature-Sensing Applications with Multidrop Capability
  - Each Device Has a Unique 64-Bit Serial Code Stored in On-Board ROM
- Flexible User-Definable Nonvolatile (NV) Alarm Settings with Alarm Search Command Identifies Devices with Temperatures Outside Programmed Limits
- Available in 8-Pin SO (150 mils), 8-Pin  $\mu\text{SOP}$ , and 3-Pin TO-92 Packages



### Similar Modules:

There is another module available that uses different types of measuring. This module uses the same pin layout and wiring, but has additional current limiting resistors to prevent burnout.

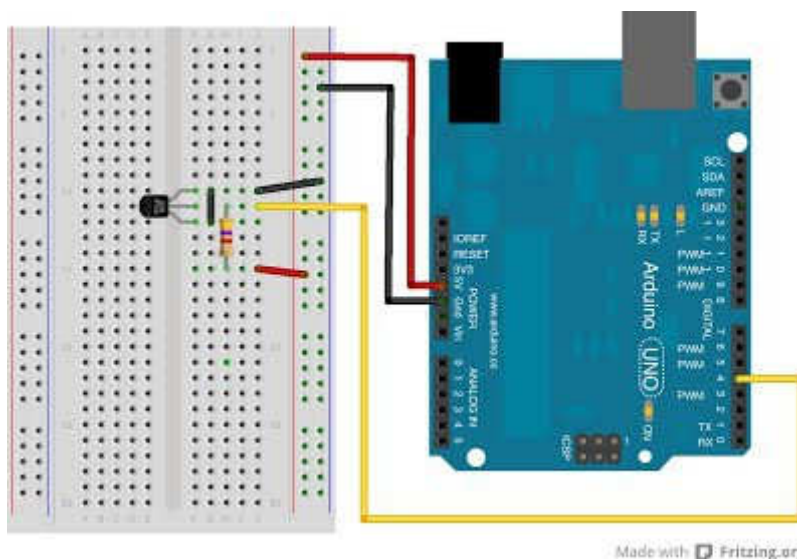
### Example of Use:

### **Materials:**

- DS18B20 Temperature Sensor Module
- 3 - Jumper Wire

### **Wiring Instructions:**

Wire the pin labeled "S" to pin 11, "--" to pin GROUND, and the middle pin to the 5V pin.





### Sketch Instructions:

After copying and uploading this code your DS18B20 module should display the temperature in Celsius and Fahrenheit . You can check your temperature valor in the serial monitor.

### Sketch Code

---

```
#include <OneWire.h>

/* DS18S20 Temperature chip i/o
 *
 */

OneWire ds(10); // on pin 10

void setup(void) {
  // initialize inputs/outputs
  // start serial port
  Serial.begin(9600);
}

void loop(void) {
  byte i;
  byte present = 0;
  byte data[12];
  byte addr[8];

  if ( !ds.search(addr)) {
    //Serial.print("No more addresses.\n");
    ds.reset_search();
    return;
  }

  Serial.print("R="); //R=28 Not sure what this is
  for( i = 0; i < 8; i++) {
    Serial.print(addr[i], HEX);
    Serial.print(" ");
  }

  if ( OneWire::crc8( addr, 7) != addr[7]) {
    Serial.print("CRC is not valid!\n");
    return;
  }

  if ( addr[0] != 0x28) {
    Serial.print("Device is not a DS18S20 family device.\n");
    return;
  }

  ds.reset();
  ds.select(addr);
  ds.write(0x44,1); // start conversion, with parasite power on at the end

  delay(1000); // maybe 750ms is enough, maybe not
  // we might do a ds.depower() here, but the reset will take care of it.

  present = ds.reset();
  ds.select(addr);
  ds.write(0xBE); // Read Scratchpad

  Serial.print("P=");
  Serial.print(present,HEX);
  Serial.print(" ");
  for ( i = 0; i < 9; i++) { // we need 9 bytes
    data[i] = ds.read();
    Serial.print(data[i], HEX);
    Serial.print(" ");
  }
}
```



```
}  
  
Serial.print(" CRC=");  
Serial.print( OneWire::crc8( data, 8), HEX);  
Serial.println();  
}
```

**Resources & Related Links:**

- <http://forum.arduino.cc/index.php/topic,39655.0.html>