

**SKU:DFR0588 (<https://www.dfrobot.com/forum/>)**

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 (<https://www.dfrobot.com/>)

## Introduction

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**Gravity: Analog SHT30 Temperature & Humidity Sensor** adopts the new generation SHT30 temperature and humidity sensor from Sensirion. Thanks to Sensirion's CMOSens® technology, highly integrated capacitive humidity sensing components and bandgap temperature sensing components, the SHT30 offers high reliability and long-term stability with low power consumption, fast response and immunity to interference. The sensor is internally calibrated, linearized and amplified to output analog voltages that are linear with temperature or humidity. It is compatible with 3.3V/5V controllers such as Arduino, micro:bit, ESP32. It is easy to achieve precise and high reliability temperature and humidity sensing for urban environment monitoring,

intelligent buildings, industrial automation, smart home and other Internet of Things applications.

## Features

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- Internal auto calibration, linear analog voltage output
- High precision, low power consumption, fast response
- Compatible with 3.3V/5V controller

## Application

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- Urban Environmental Monitoring
- Intelligent Building, Home
- Industrial Automation

## Specification

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- IC (Sensor): Sensirion SHT30
- Input Voltage (VCC) : 3.3V - 5.5V

- Interface: Gravity Analog (PH2.0-3P, analog voltage output 0.3-2.7V)
- Quiescent Current: <0.5 mA
- Dimension: 30×32 mm / 1.18×1.26 in
- Weight: 4g
- **Temperature Performance**
  - Range: -40 - 125 °C
  - Resolution: 0.01 °C, 14bit
  - Accuracy: ±0.2°C@10 - 55°C (typical), ±1.5°C@-40 - 125 °C (typical)
  - Response Time: >2s
- **Humidity Performance**
  - Range: 0 - 100 %RH
  - Resolution: 0.006 %, 14bit
  - Accuracy: ±3 %RH@10 - 90 %RH (typical), ±8 %RH@0 - 100 %RH (typical)
  - Response Time: >8s

• response time: <math>20s</math>

## Board Overview

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No.	Label	Description
1	-	Power GND
2	+	Power VCC (3.3~5.5V)
3	RH	Relative humidity analog output (0.3-2.7V)
4	T	Temperature analog output (0.3-2.7V)
5	/	2.54mm-4P via pinout

## Output Characteristic

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- When the module is powered within rated input voltage and works normally, it outputs a

voltage of 0.3~2.7V which is linear with temperature or humidity. The corresponding relationship is shown below.



## Arduino Tutorial

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This tutorial presents a basic usage of the module with Arduino UNO.

### Requirements

- **Hardware**
  - DFRduino UNO R3 (<https://www.dfrobot.com/product-838.html>) (or similar) x 1
  - Gravity: Analog SHT30 Temperature & Humidity Sensor x 1
  - Gravity 3P sensor wire (or Dupont wires) x 1
- **Software**
  - Arduino IDE (<https://www.arduino.cc/en/Main/Software>)

### Connection Diagram



```

// VREF: Analog Reference
// For Arduino UNO, Leonardo and mega2560, etc. change VREF to 5
// For Arduino Zero, Due, MKR Family, ESP32, etc. 3V3 controllers, change VREF to 3.3
#define VREF 5.0
#define TEMPERATURE_PIN A1

#define HUMIDITY_PIN A0
#define ADC_RESOLUTION 1024

float Tc, Tf, RH, analogVolt;

void setup() {
  Serial.begin(115200);
  Serial.println("SHT30 Starts up.");
}

void loop() {

  analogVolt = (float)analogRead(TEMPERATURE_PIN) / ADC_RESOLUTION * VREF;
  // Convert voltage to temperature (°C, centigrade)
  Tc = -66.875 + 72.917 * analogVolt;
  // Convert voltage to temperature (°F, fahrenheit )
  Tf = -88.375 + 131.25 * analogVolt;
  Serial.print("Temperature:");
  Serial.print(Tc, 1);
  Serial.print(" °C \n");
}

```

```
Serial.print(" C / ");  
Serial.print(Tf, 1);  
Serial.println(" F" );  
  
analogVolt = (float)analogRead(HUMIDITY_PIN) / ADC_RESOLUTION * VREF;  
  
// Convert voltage to relative humidity (%)  
RH = -12.5 + 41.667 * analogVolt;  
  
Serial.print("Humidity:" );  
Serial.print(RH, 1);  
Serial.println(" %RH" );  
  
Serial.println();  
delay(2000);  
}
```

## Results

- Temperature or relative humidity is printed every 2s.





# micro:bit Tutorial

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This tutorial presents a basic usage of the module with micro:bit.

## Requirements

- **Hardware**
  - micro:bit - an Educational & Creative Tool for Kids (<https://www.dfrobot.com/product-1587.html>) x 1
  - Micro:Mate - A Mini Expansion Board for micro:bit (<https://www.dfrobot.com/product-1699.html>) x 1
  - Gravity: Analog SHT30 Temperature & Humidity Sensor
  - Gravity 3P sensor wire (or Dupont wires) x 1
- **Software**
  - Microsoft MakeCode for micro:bit (<https://makecode.microbit.org/>)

## Connection Diagram



## Example Codes



## Results

- Temperature and relative humidity are printed from serial every 2s.



## FAQ

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For any questions, advice or cool ideas to share, please visit the **DFRobot Forum** (<https://www.dfrobot.com/forum/>).


## More Documents

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- Schematic

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([https://github.com/DFRobot/Wiki/raw/master/DFR0588/res/DFR0588%20\(V1.0\)%20Schematic.pdf](https://github.com/DFRobot/Wiki/raw/master/DFR0588/res/DFR0588%20(V1.0)%20Schematic.pdf))

- Layout & Dimension  
([https://github.com/DFRobot/Wiki/raw/master/DFR0588/res/DFR0588%20\(V1.0\)%20Layout%20with%20dimension.pdf](https://github.com/DFRobot/Wiki/raw/master/DFR0588/res/DFR0588%20(V1.0)%20Layout%20with%20dimension.pdf))
- Sensirion SHT3x-ARP Datasheet  
(<https://github.com/DFRobot/Wiki/raw/master/DFR0588/res/SHT30-ARP-B.PDF>)

 Get **DFR0588 Gravity: Analog SHT30 Temperature & Humidity Sensor** (<https://www.dfrobot.com/product-1908.html>) from DFRobot Store or **DFRobot Distributor**.  
(<https://www.dfrobot.com/index.php?route=information/distributorslogo>)

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