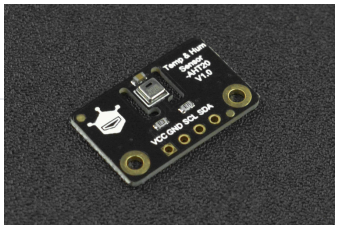
(https://www.dfrobot.com/product-2603.html)



Introduction

The AHT20 is a high-precision but low-cost temperature and humidity sensor, which is equipped with an improved MEMS semiconductor capacitive humidity sensor element. It features standard I2C interface and a wide voltage supply of 2V - 5V. And with simple peripheral circuit, it performs stably even in harsh environments in the measuring range of -40 - 85°C. This sensor can be widely used for measuring the environmental temperature and humidity of home electronic equipment, the temperature and humidity of automobiles and so on.

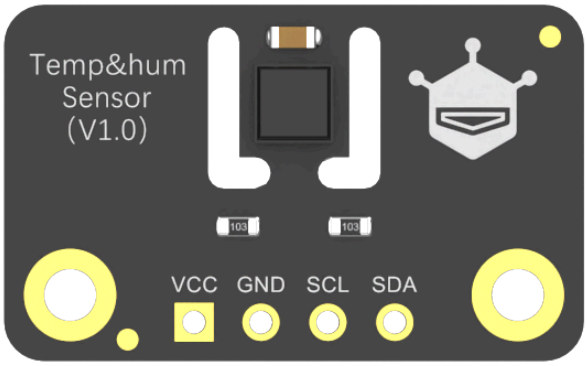
Features

- Digital output, I2C interface
- Excellent long-term stability
- Quick response and strong anti-interference ability

Applications

- HVAC
- Dehumidifier
- Testing and Inspection Equipment
- Consumer Appliances
- Automobiles
- Automatic Control
- Data Loggers
- Weather Stations

Pinout



Pin	Function	Description
VCC	+	Power Supply: DC 2V~5V
GND	-	--
SCL	I2C Clock Line	--
SDA	I2C Data Line	--

Specification

Module Parameters

- Operating Voltage: DC2V~5V
- Output Signal: I2C
- I2C Address: 0x38
- Dimension: 30mm×20.5mm/1.18×0.81"

AHT20 Chip Parameters

Relative Humidity

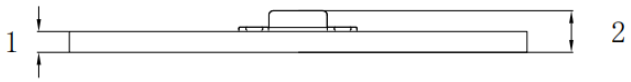
- Resolution: 0.024 %RH
- Accuracy Error: +2% RH

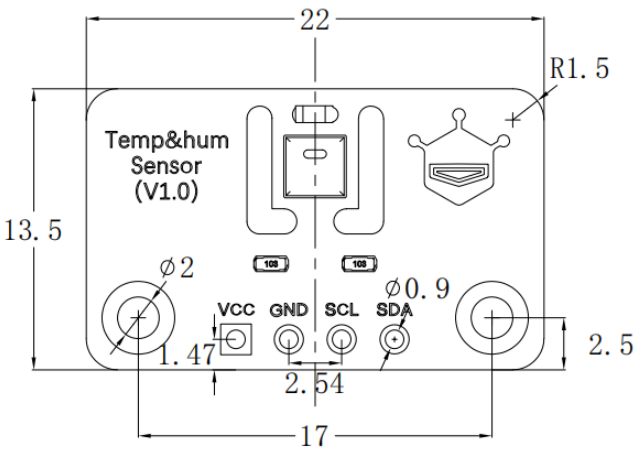
- Repeatability: ±0.1 %RH
- Hysteresis: ±1 %RH
- Non-linear: ±0.1 %RH
- Response Time: 8S
- Operating Range: 0~100 %RH
- Long-term Drift: 0.5 %RH/yr

Temperature

- Resolution: 0.01°C
- Accuracy Error: ±0.3°C
- Repeatability: ±0.1°C
- Hysteresis: ±0.1°C
- Response Time: minimum 5S, maximum 30S
- Operating Range: -40°C~85°C
- Long-term Drift: <0.04°C/yr

Dimension Diagram





Tutorial

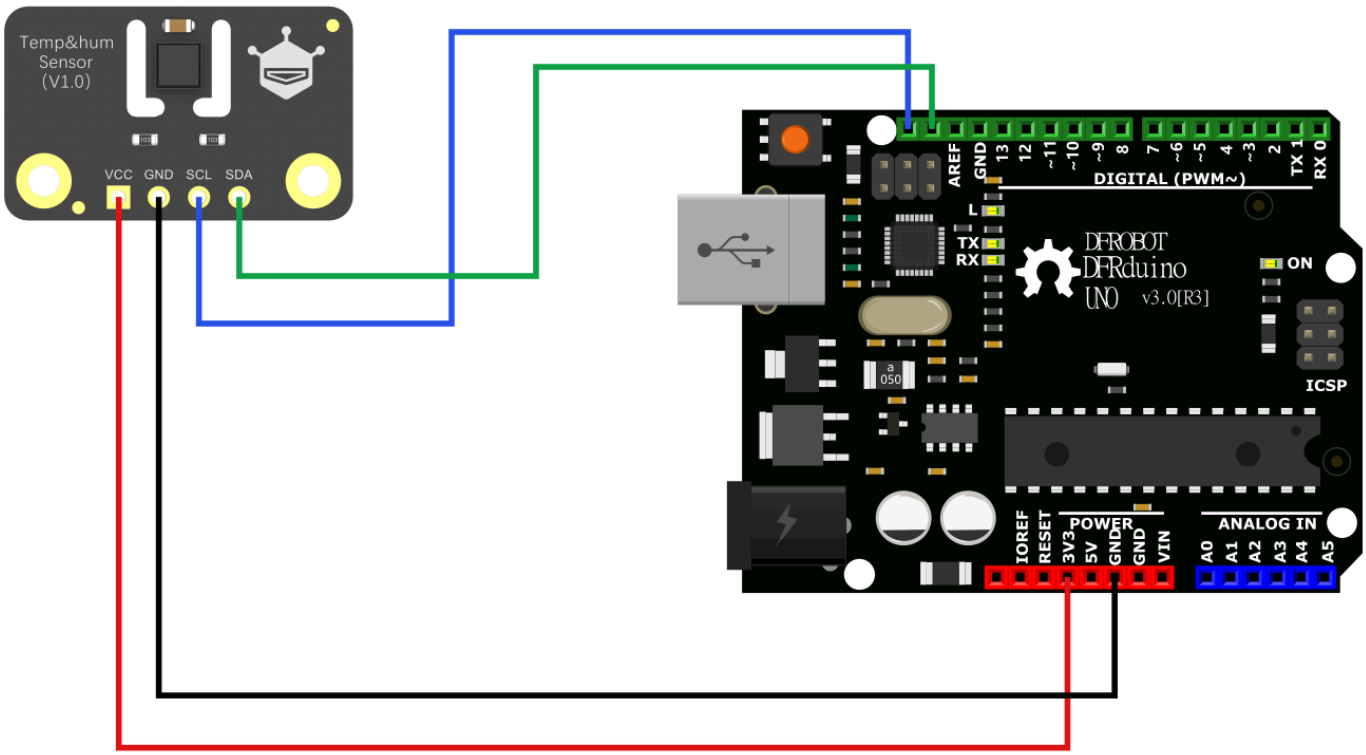
Hardware Requirement

- DFRduino UNO R3 (https://www.dfrobot.com/product-838.html) (or similar) x 1
- SEN0527 Fermion: AHT20 Temperature and Humidity Sensor x 1
- M-M/F-M/F-F Jumper wires

Software Requirement

- Arduino IDE (https://www.arduino.cc/en/Main/Software)
- Download and install the **DFRobot_AHT20 Library** (https://github.com/DFRobot/DFRobot_AHT20) (About how to install the library? (https://www.arduino.cc/en/Guide/Libraries#.UxU8mdzF9H0))

Connection Diagram



UNO Board: 3V3 - connect to - AHT20:VCC
UNO Board: GND - connect to - AHT20:GND
UNO Board: SCL - connect to - AHT20:SCL
UNO Board: SDA - connect to - AHT20:SDA

Sample Code

The following code will read the measured values from the AHT20 temperature and humidity sensor and print them through the serial port.

```
#include "DFRobot_AHT20.h"

DFRobot_AHT20 aht20;

void setup(){
  Serial.begin(115200);
  uint8_t status;
  while((status = aht20.begin()) != 0){
    Serial.print("AHT20 sensor initialization failed. error status : ");
    Serial.println(status);
    delay(1000);
  }
}

void loop(){
  if(aht20.startMeasurementReady(/* crcEn = */true)){
    Serial.print(aht20.getTemperature_C());
    Serial.print(" C, ");
    // Get temp in Fahrenheit (F)
    Serial.print(aht20.getTemperature_F());
    Serial.print(" F\t");
    Serial.print(aht20.getHumidity_RH());
    Serial.println(" %RH");
    delay(5000);
  }
}
```

Result

As shown in the figure below, the temperature values in °C and °F, and humidity values are displayed in the serial monitor.

COM6

```
20.71 C, 69.28 F          39.57 %RH
20.72 C, 69.30 F          39.55 %RH
20.74 C, 69.34 F          39.53 %RH
20.77 C, 69.38 F          39.47 %RH
20.77 C, 69.38 F          39.55 %RH
20.74 C, 69.32 F          39.54 %RH
20.72 C, 69.29 F          39.55 %RH
20.73 C, 69.31 F          39.54 %RH
20.76 C, 69.36 F          39.52 %RH
20.74 C, 69.33 F          39.46 %RH
20.77 C, 69.39 F          39.49 %RH
20.77 C, 69.39 F          39.36 %RH
20.81 C, 69.47 F          39.24 %RH
20.83 C, 69.50 F          39.18 %RH
```

API Function

```
/**
  * @fn DFRobot_AHT20
  * @brief DFRobot_AHT20 constructor
  * @param wire TwoWire class object reference
  * @return NONE
  */
 DFRobot_AHT20(TwoWire &wire = Wire);
 /**
  * @fn begin
  * @brief Initialize AHT20 sensor
  * @return Init status value
  * @retval  0    Init succeeded
  * @retval  1    _pWire is NULL, please check if the constructor DFRobot_AHT20 has correctly uploaded a TwoWire class object reference
  * @retval  2    Device is not found, please check if the connection is correct
  * @retval  3    If the sensor init fails, please check if there is any problem with the sensor, you can call the reset function and re-initialize after
  */
 uint8_t begin();
 /**
  * @fn reset
  * @brief Sensor soft reset, restore the sensor to the initial status.
  * @return NONE
  */
 void reset();
 /**
  * @fn startMeasurementReady
  * @brief Start measurement and determine if it’s completed.
  * @param crcEn Whether to enable check during measurement
  * @n     false  Measure without check (by default)
  * @n     true   Measure with check
  * @return Whether the measurement is done
  * @retval true  If the measurement is completed, call a related function such as get* to obtain the measured data.
  * @retval false If the measurement failed, the obtained data is the data of last measurement or the initial value 0 if the related function such as get
  */
 bool startMeasurementReady(bool crcEn = false);
 /**
  * @fn getTemperature_F
  * @brief Get ambient temperature, unit: Fahrenheit (F).
  * @return Temperature in F
  * @note  AHT20 can't directly get the temp in F, the temp in F is calculated according to the algorithm: F = C x 1.8 + 32
  * @n Users must call the startMeasurementReady function once to start the measurement before calling this function so as to get the real-time measured
  * @n otherwise what they obtained is the initial data or the data of last measurement.
  */
 float getTemperature_F();
 /**
  * @fn getTemperature_C
  * @brief Get ambient temperature, unit: Celsius (℃).
  * @return Temperature in ℃, it's normal data within the range of -40-85℃, otherwise it's wrong data
  * @note Users must call the startMeasurementReady function once to start the measurement before calling this function so as to get the real-time measur
  * @n otherwise what they obtained is the initial data or the data of last measurement.
  */
 float getTemperature_C();
 /**
  * @fn getHumidity_RH
  * @brief Get ambient relative humidity, unit: %RH.
  * @return Relative humidity, range 0-100
  * @note Users must call the startMeasurementReady function once to start the measurement before calling this function so as to get the real-time measur
  * @n otherwise what they obtained is the initial data or the data of last measurement
  */
 float getHumidity_RH();
```

More Documents

SEN0527_2D Dimensions_PDF.pdf (https://dfimg.dfrobot.com/nobody/wiki/9a7d61032f6f624658a9a89d2ea8ca68.pdf)

SEN0527_2D Dimensions_CAD.rar (https://dfimg.dfrobot.com/nobody/wiki/f9d514930a05e0800424dc8165e8d1a8.rar)

SEN0527_3DSTP.rar (https://dfimg.dfrobot.com/nobody/wiki/082b477089c11d8b1cb1a50ff1efaed0.rar)

SEN0527-Circuit Diagram SCH.pdf (https://dfimg.dfrobot.com/nobody/wiki/adda98fc407766181b58dc5a38c99436.pdf)

FAQ

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