

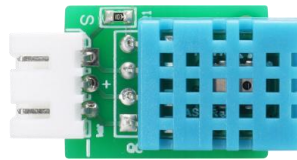
Project 10-Temperature and Humidity Sensor

1. project description

Through this project, you can understand the temperature and humidity sensor and learn the programming of the temperature and humidity sensor. Learn how to use the DHT11 temperature and humidity sensor to obtain the temperature and humidity values of the environment and print them to the software's serial monitor.

2. Introduction to modules

2.1 DHT11



Resolution: 16Bit Repeatability: $\pm 1\%$ RH Accuracy: At 25°C $\pm 5\%$ RH

Interchangeability: Completely interchangeable

Response time: 1/e (63%) 25°C 6s 1m/s air 6s

Hysteresis: $\leq \pm 0.3\%$ RH

Long-term stability: $\leq \pm 0.5\%$ RH / yr in Temperature:

Resolution: 16Bit Repeatability: $\pm 0.2^\circ\text{C}$ Range: $\pm 2^\circ\text{C}$ at 25°C

Response time: 1/e (63%) 10S

Electrical characteristics Power supply: DC 3.5~5.5V

Supply current: measuring 0.3mA, standby 60 μA

Sampling period: > 2s.

Pin description :

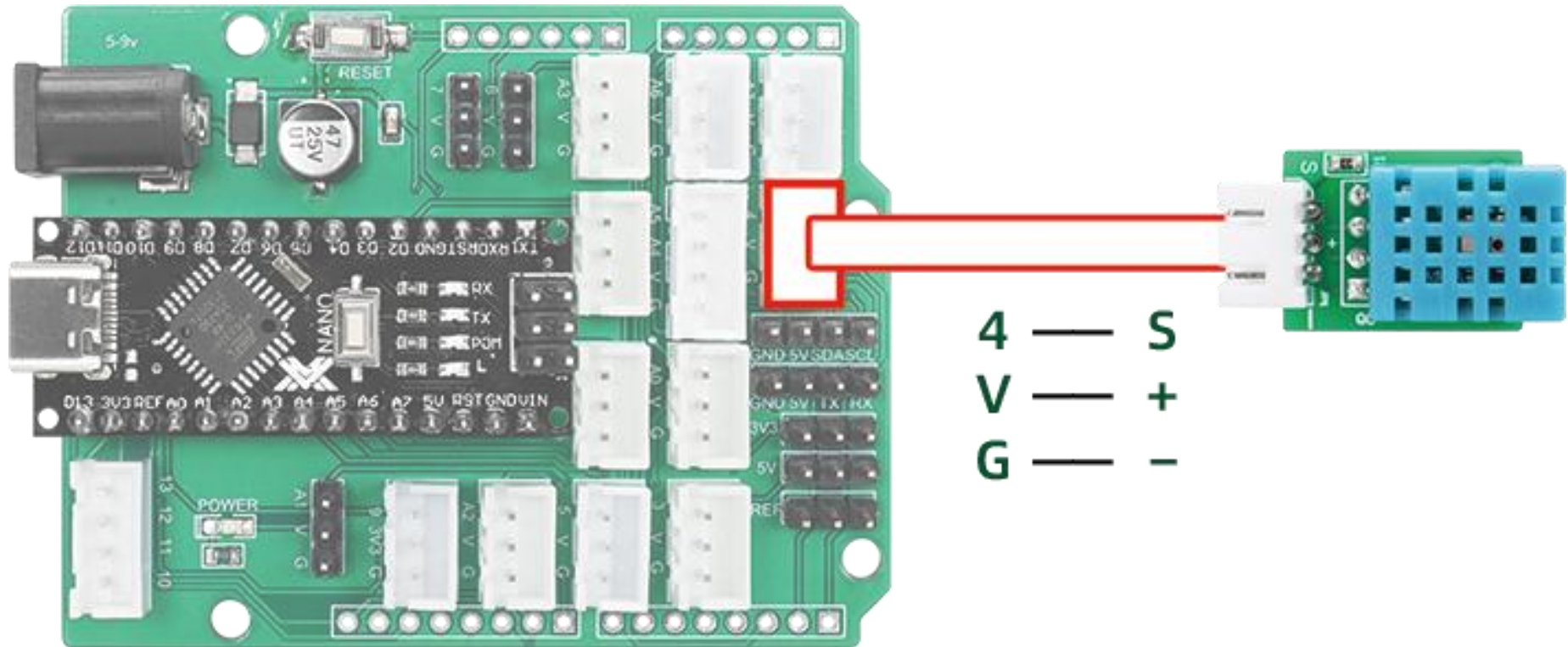
VDD: Power supply 3.5~5.5V DC

DATA: serial data, single bus

NC: empty needle

GND: Ground, negative pole of power supply

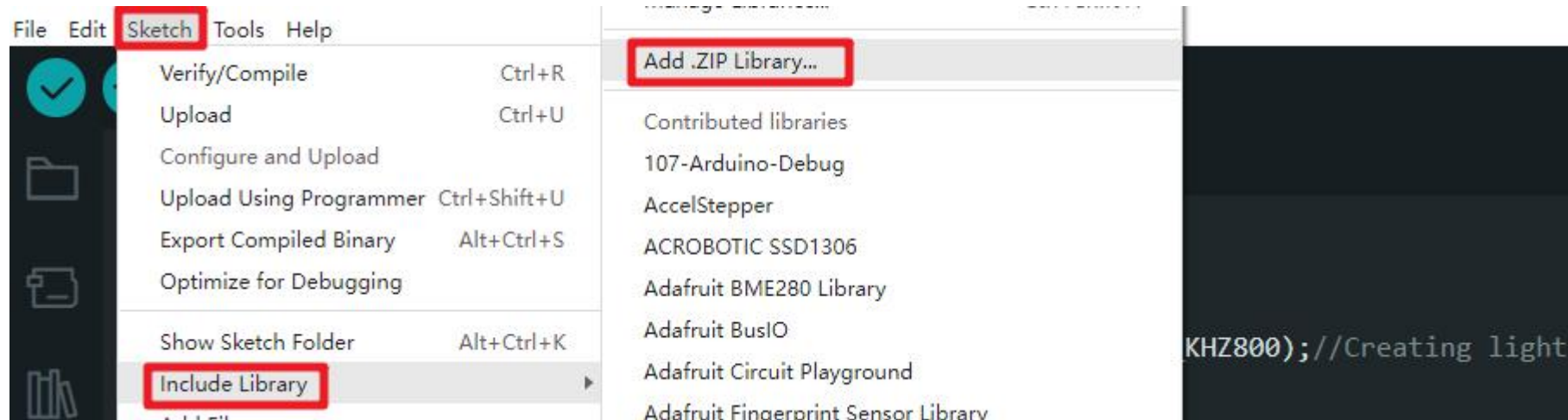
3. Project wiring diagram



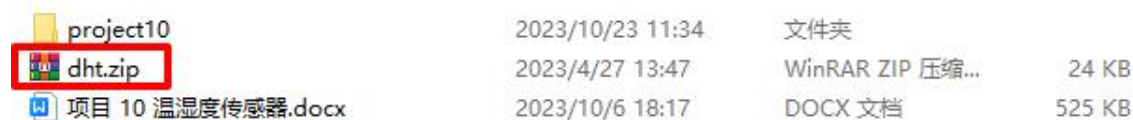
4. Add dht library

In the Arduino IDE, navigate to Sketch > Include Library > Add .ZIP Library and at the top of the drop-down list, select

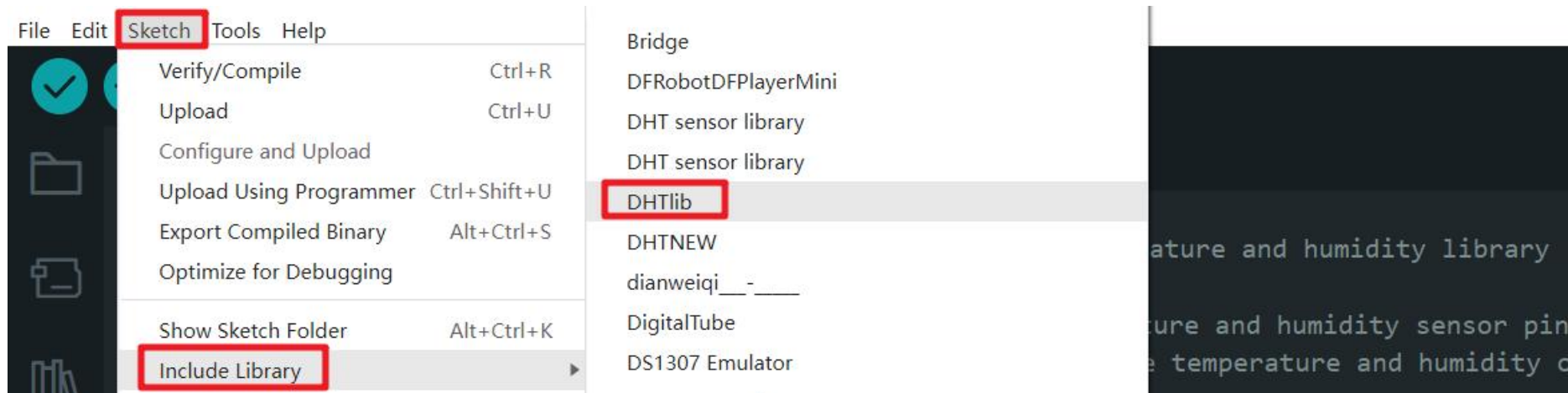
the "Add .ZIP Library" option.



The system will prompt you to select the library to be added , as shown below, navigate to the path location of the saved dht .zip file on your computer (*Item 10 Temperature and Humidity Sensor\ dht .zip*) and open it .



Open the Sketch > Include Library menu. You should now see Libraries at the bottom of the drop-down menu. It's ready to use in your sketches .



5. Download Arduino code

Open the project Arduino code file (path: Project 10 Temperature and Humidity Sensor\project10\project10.ino)

project10	2023/10/23 11:34	文件夹	
dht.zip	2023/4/27 13:47	WinRAR ZIP 压缩...	24 KB
项目 10 温湿度传感器.docx	2023/10/6 18:17	DOCX 文档	525 KB

As with the previous project, use USB to connect the main control board to the computer, select the newly displayed COM number, click "Download" to start compiling and downloading the program to the main control board.



After the download is completed, open the serial monitor and you can see the printed temperature and humidity values.




Code analysis:

```
1  #include <Wire.h>
2  #include <dht.h>           //添加温湿度库      Add temperature and humidity library
3  #define DHT11_PIN 4 //定义温湿度传感器引脚4    Define temperature and humidity sensor pin4
4  dht DHT;                 //实例化温湿度对象为DHT  Instantiate the temperature and humidity object as a DHT
5
6  void setup()
7  {
8      Serial.begin(9600);
9      pinMode(DHT11_PIN,INPUT);
10 }
11 void loop()
12 {
13     int chk = DHT.read11(DHT11_PIN); //读取温湿度      Reading temperature and humidity
14     Serial.print("temp:");
15     Serial.print(DHT.temperature,1); //打印温度值      print the temprature value
16     Serial.print("--humi:");
17     Serial.println(DHT.humidity,1); //打印湿度值      print the humidity value
18     delay(200);
19 }
```


6. Download Mind+ graphical code

Open the project Mind+ code file (path: Project 10 Temperature and Humidity Sensor\Temperature_humidity.mp)



project10	2023/10/23 11:34	文件夹	
dht.zip	2023/4/27 13:47	WinRAR ZIP 压缩...	24 KB
Temperature_humidity.mp	2023/10/23 11:24	MP 文件	166 KB
项目 10 温湿度传感器.docx	2023/10/23 11:58	DOCX 文档	589 KB

Connect the main control board to the computer with a USB cable and select the newly appeared CH340 serial port COM number. Click "Upload to Device" to complete the code upload.

The above is the function of obtaining temperature and humidity by downloading the code provided and downloading it to the control panel. When you want to create a new file and start programming again, you need to add a temperature and humidity sensor module. Click "Extension" in the lower left corner, enter and then select the main control board type as Nano.

← 返回 选择主控板

主控板 套件 扩展板 传感器 执行器 通信模块 显示器 功能模块 网络服务 用户库

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Arduino Nano

Arduino Nano主控板控制的设备



DFR0608

掌控板

基于ESP32的主控板

Add DHT11/22 temperature and humidity sensor library file : click the "Sensor" type and select DHT11/22 temperature and humidity sensor



After the addition is successful, you can see that there are two more categories in the programming block column on the left:

Nano and "Sensor"



Complete programming and printing of temperature and humidity values are as follows:

The image displays a block-based programming environment for a Nano board. The code is as follows:

```
NANO 主程序开始
NANO 设置串口波特率为 9600
循环执行
  设置 temp 的值为 读取引脚 4 DHT11 温度(°C)
  设置 humi 的值为 读取引脚 4 DHT11 湿度(%rh)
  串口 字符串输出 temp: 不换行
  串口 字符串输出 变量 temp 不换行
  串口 字符串输出 --humi: 不换行
  串口 字符串输出 变量 humi 换行
  等待 0.5 秒
```

Comments for the code blocks:

- 读取温度、湿度分别保存到变量temp和humi
- //打印温度值 print the temprature value
- //打印湿度值 print the humidity value

The terminal window shows the output of the program:

```
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
temp:27.00--humi:47.00
```

The terminal interface includes a scroll bar, a baud rate dropdown set to 9600 波特率, a dropdown for the ending character set to 没有结束符, and a 发送 (Send) button.