

Temperature and Humidity Sensor

Be Careful!

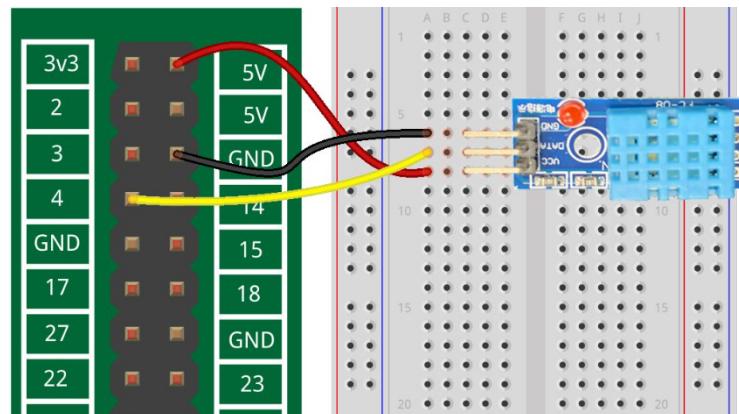


There are many different flavors of temperature and humidity sensors. They may look alike and even have similar numbers, but have their pins arranged differently. You *must* check the labels on the device itself. Do not rely on any diagram on the web or elsewhere for physical connections.

Label	Connects to
D, Data, Out, S, Signal	GPIO Pin 4
G, GND,	GND
V, VCC, Vcc, +	5V

Wiring

See the caution note above. Do not rely on this diagram or any other for the order of pins. This is for a three-pin temperature and humidity sensor. Devices with four pins need a 10 K ohm pull-up resistor, and are not covered here.



Add the Python 3 Library

Pull in the Adafruit library for Python 3 with this command:

```
sudo pip3 install Adafruit_DHT
```

Programming

Here is a sample program that will print the humidity and temperature every three seconds. Some sensors should not be sampled more often than every three seconds, so consider that to be a minimum.

This device uses the 1Wire interface, which is pin 4 on the Raspberry Pi. More configuration is needed to use other pins.

```
import sys
import Adafruit_DHT
from time import sleep
while True:
    sleep(3)
    humidity, temperature = Adafruit_DHT.read_retry(11, 4)
    # 11 is the sensor type and 4 is the pin number.
    print ('Temp: {0:0.1f} C  Humidity: {1:0.1f}%' .
          format(temperature, humidity))
```

The strange line with `humidity`, `temperature` on the left of the equal sign is because `Adafruit_DHT.read_retry` returns a *sequence*. The first item in the sequence, `humidity`, is stored in the first variable, and the second, `temperature`, is stored in the second variable.

The print statement uses a format string to format the temperature and humidity values. For more information, search “python print formatted string.”

You can use the variables `temperature` and `humidity` in other ways. For example, the temperature is given in Celsius. You could convert it to Fahrenheit by looking up and programming the conversion formula.

Support for Raspberry Pi 4

As of spring, 2021, the Adafruit library did not support the Raspberry Pi 4. If you are using a Pi 4, you may need to make this additional change.

In a terminal window, type the following:

```
cd /usr/local/lib/python3.7/dist-packages/Adafruit_DHT/  
sudo nano platform_detect.py
```

Scroll to the bottom of the file with the down-arrow.

Just *before* the lines:

```
else:  
    # Something else, not a pi.  
    return None
```

Insert

```
elif match.group(1) == 'BCM2711':  
    return 3
```

so that the last several lines of the file look like this:

```
elif match.group(1) == 'BCM2835':  
    # Pi 3  
    return 3  
elif match.group(1) == 'BCM2837':  
    # Pi 3b+  
    return 3  
elif match.group(1) == 'BCM2711':  
    return 3  
else:  
    # Something else, not a pi.  
    return None
```

These lines check the kind of CPU that's being used. Be careful that the indentation matches up with what's already there.

Save the file with Ctrl-X and Y. Type "cd ~" to return to the home directory