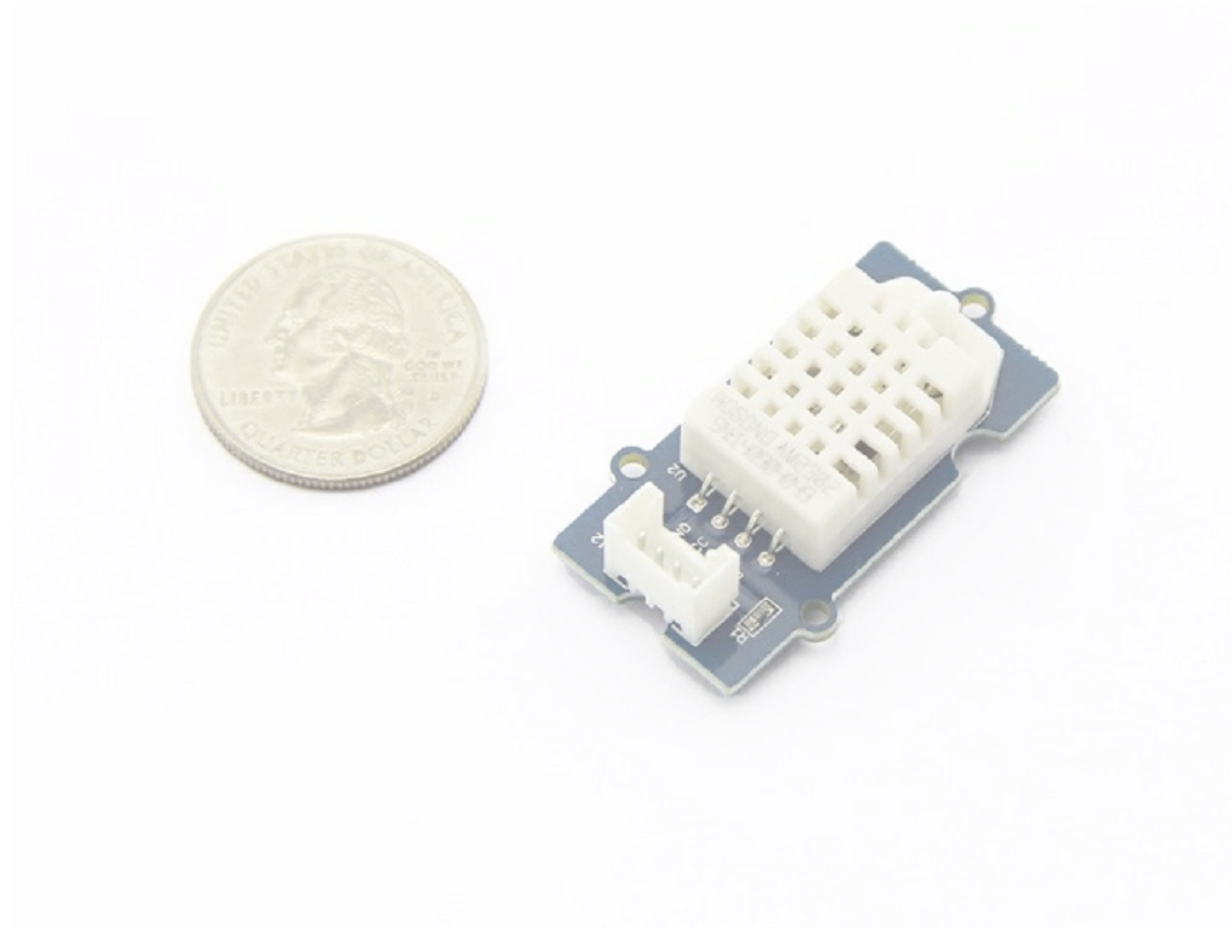# Grove - Temperature&Humidity Sensor Pro(DHT22)

This is a powerful sister version of our Grove - Temperature&Humidity Sensor Pro. It has more complete and accurate performance than the basic version. The detecting range of this sensor is 5% RH - 99% RH, and -40°C - 80°C. And its accuracy reaches up to 2% RH and 0.5°C. A professional choice for applications that have relatively strict requirements.

Specification

Item	Min	Norm	Max	Unit
Input voltage (VCC)	3.3	-	6	V
I/O Logic Level	-	based on VCC	-	V
Measuring Current Supply	1	-	1.5	mA
Standby Current Supply	40	-	50	uA
Measuring range (Humidity)	5%	-	99%	RH
Measuring range (Temperature)	-40	-	80	°C
Accuracy (Humidity)	-	-	±2%	RH
Accuracy (Temperature)	-	-	±0.5	°C
Resolution (Humidity)	-	-	0.1%	RH
Resolution (Temperature)	-	-	0.1	°C
Repeatability (Humidity)	-	-	±0.3%	RH
Repeatability (Temperature)	-	-	±0.2	°C
Long-term Stability	-	-	±0.5%	RH/year
Signal Collecting Period	-	2	-	S
Respond Time 1/e(63%)	6	-	20	S
Signal pin mode	-	Digital	-	-

> Tip
> More details about Grove modules please refer to Grove System

Platforms Supported
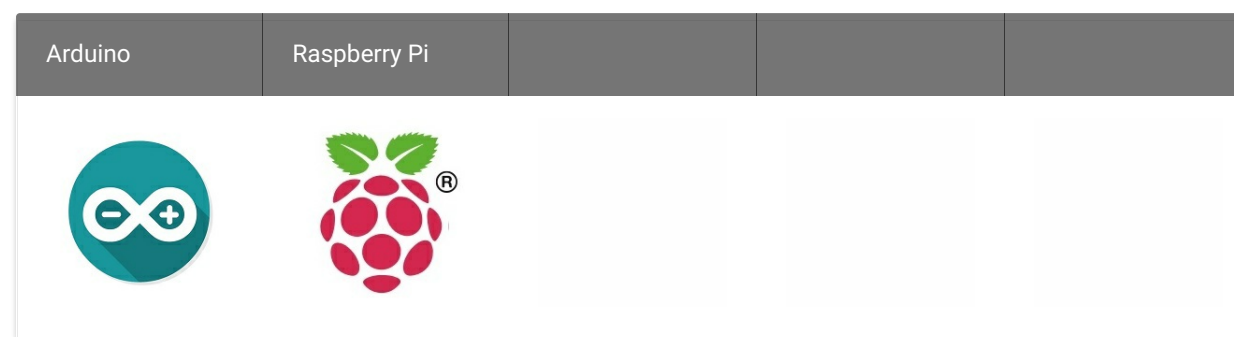
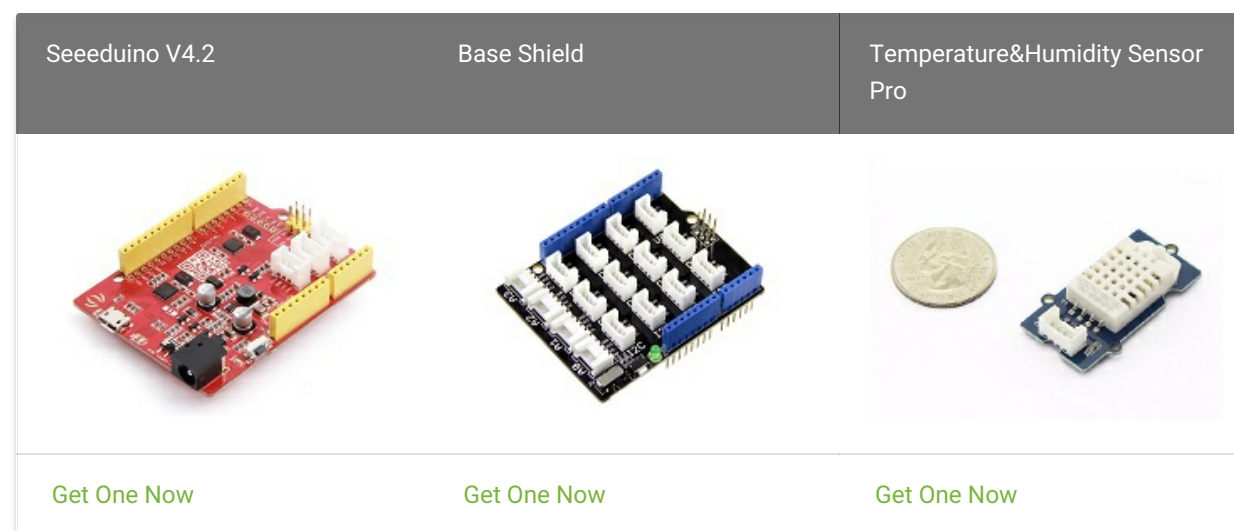| Arduino	Raspberry Pi			

Getting Started

Note
If this is the first time you work with Arduino, we strongly recommend you to see Getting Started with Arduino before the start.

Play With Arduino

Hardware

Materials required

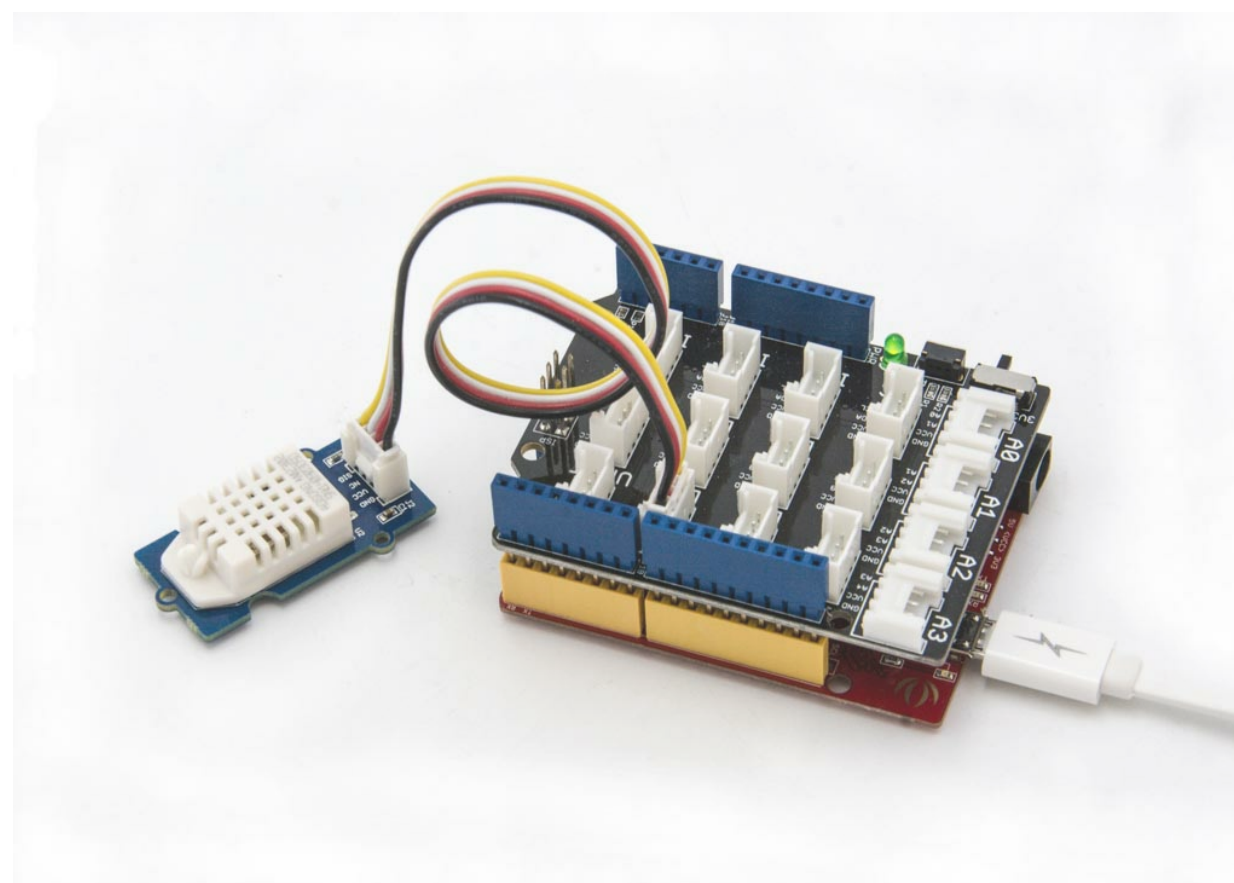| Seeeduino V4.2	Base Shield	Temperature&Humidity Sensor Pro
Get One Now	Get One Now	Get One Now

Note
1 Please plug the USB cable gently, otherwise you may damage the port. Please use the USB cable with 4 wires inside, the 2 wires cable can't transfer data. If you are not sure about the wire you have, you can click here to buy

2 Each Grove module comes with a Grove cable when you buy. In case you lose the Grove cable, you can click here to buy

- Step 1. Connect Grove - Temperature&Humidity Sensor Pro to port D2 of Grove-Base Shield.
- Step 2. Plug Grove - Base Shield into Seeeduino.
- Step 3. Connect Seeeduino to PC via a USB cable.

Note
If we don't have Grove Base Shield, We also can directly connect Grove - Temperature and Humidity Sensor Pro to Seeeduino as below.

Seeeduino	Temperature&Humidity Sensor Pro
5V	Red
GND	Black
Not Conencted	White
D2	Yellow

Software

- Step 1. Download the Seeed DHT library from Github.

- Step 2. Refer to How to install library to install library for Arduino.

- Step 3. Restart the Arduino IDE. Open " DHTtester" example via the path: File → Examples → Grove_Humidity_Temperature_Sensor-master → DHTtester. Through this demo, we can read the temperature and relative humidity information of the environment.
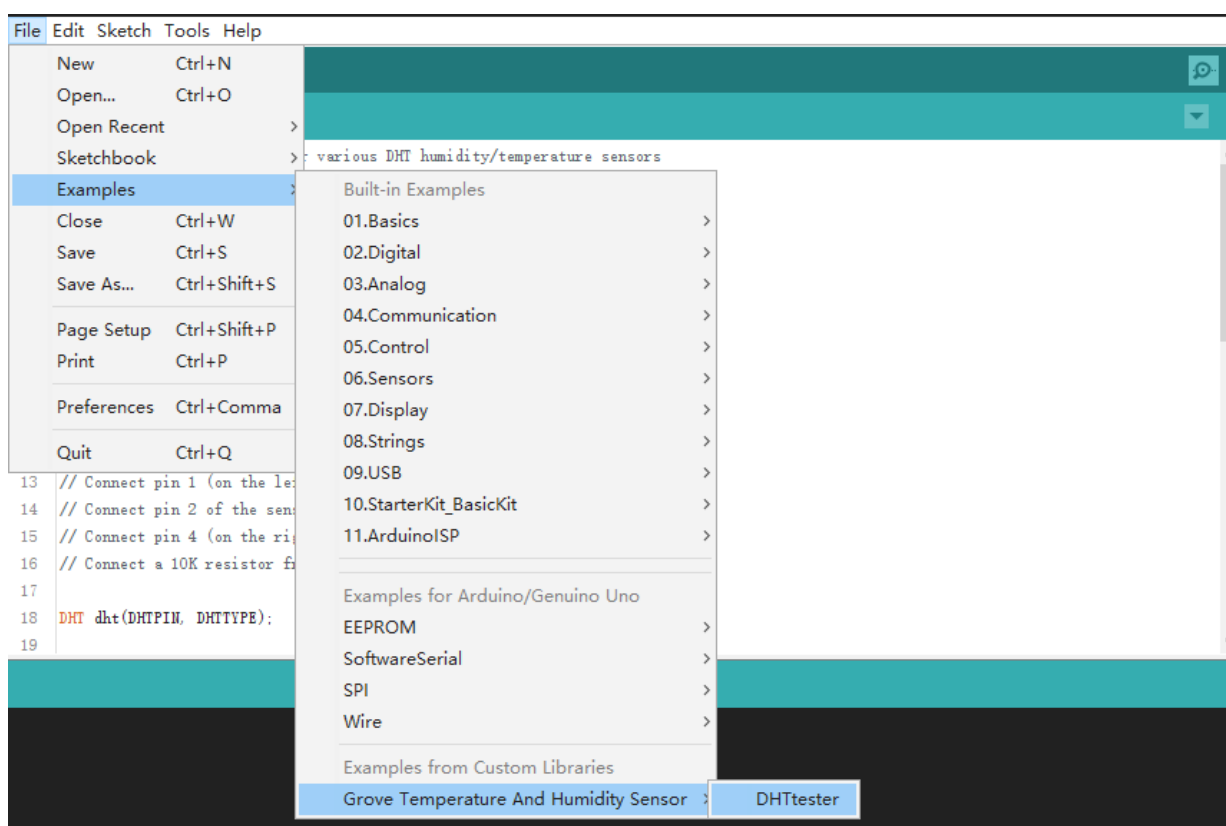
> **Note**
> This Grove - Temperature&Humidity Sensor Pro and our another product Grove-Temperature and Humidity Sensor are sharing this library. No matter which product you are using, make sure that you have made the definition line of the sensor of your board into effect and commented out the definition lines of other specs. For example, the sensor we used on Grove - Temperature and Humidity Sensor Pro is DHT 22. So the definition part of the sensor spec should be:

```
//#define DHTTYPE DHT11   // DHT 11
#define DHTTYPE DHT22   // DHT 22  (AM2302)
//#define DHTTYPE DHT21   // DHT 21 (AM2301)
```

- Step 4. Upload the demo. If you do not know how to upload the code, please check How to upload code .

- Step 5. Open the Serial Monitor of Arduino IDE by click Tool-> Serial Monitor. Or tap the `Ctrl` + `Shift` + `M` key at the same time. if every thing goes well, you will get the result.
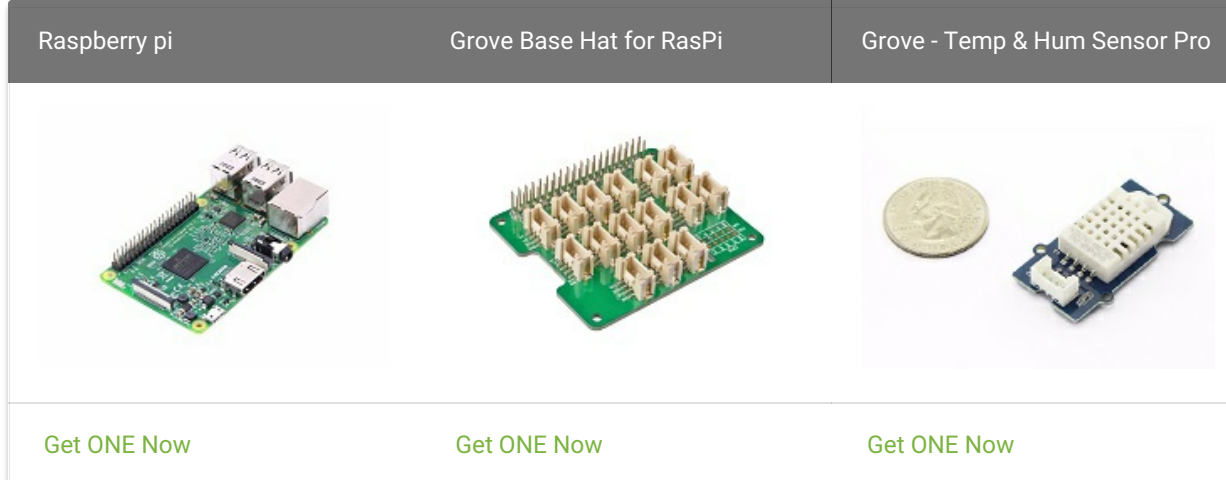
The result should be like:
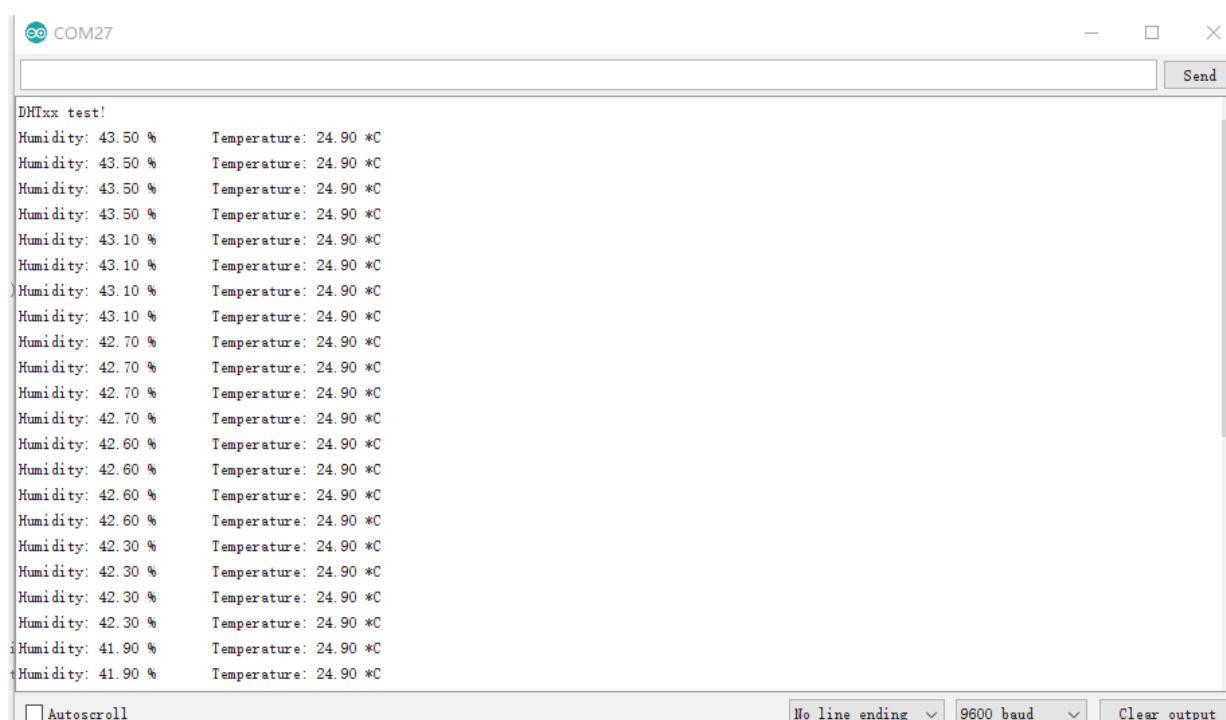
Play With Raspberry Pi (With Grove Base Hat for Raspberry Pi)

Hardware

- Step 1. Things used in this project:

Raspberry pi	Grove Base Hat for RasPi	Grove - Temp & Hum Sensor Pro
Get ONE Now	Get ONE Now	Get ONE Now

- Step 2. Plug the Grove Base Hat into Raspberry.
- Step 3. Connect the temperature and humidity sensor pro to port 12 of the Base Hat.
- Step 4. Connect the Raspberry Pi to PC through USB cable.
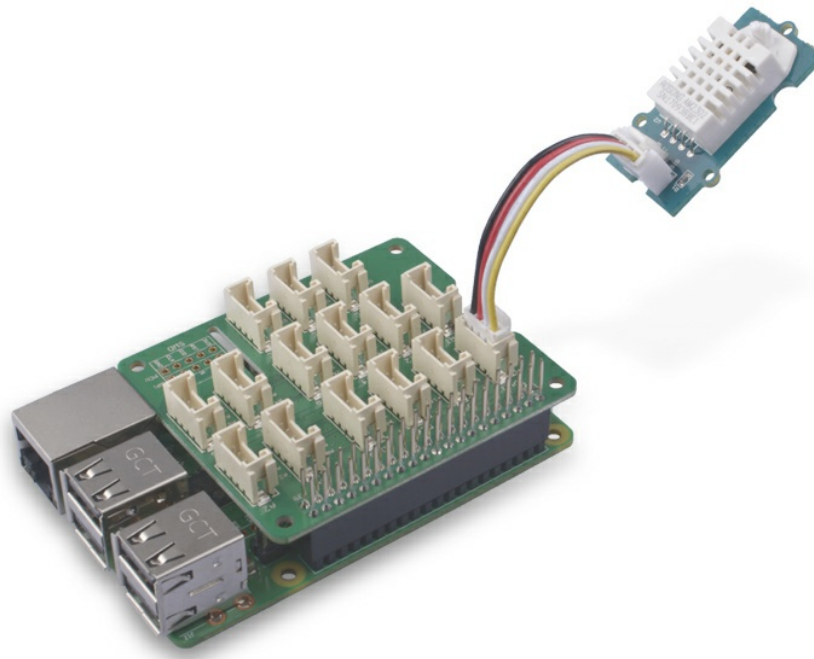
> **Note**
> For step 3 you are able to connect the temperature and humidity sensor pro to any GPIO Port but make sure you change the command with the corresponding port number.

Software

- Step 1. Follow Setting Software to configure the development environment.
- Step 2. Download the source file by cloning the grove.py library.

```
cd ~
git clone https://github.com/Seeed-Studio/Seeed_Python_DHT.git
```

- Step 3. Excute below commands to run the code.

```
cd Seeed_Python_DHT
sudo python setup.py install
cd ~/Seeed_Python_DHT/examples
nano dht_simpleread.py
```

Change the sensor = seeed_dht.DHT("11", 12) to sensor = seeed_dht.DHT("22", 12), Following is the dht_simpleread.py code.

```python
import time
import seeed_dht
def main():

    # for DHT11/DHT22
    sensor = seeed_dht.DHT("22", 12)
    # for DHT10
    # sensor = seeed_dht.DHT("10")

    while True:
        humi, temp = sensor.read()
        if not humi is None:
            print('DHT {0}, humidity {1:.1f}%, temperature {2:.1f}*'.format(sensor.dht_type, humi, temp))
        else:
            print('DHT {0}, humidity & temperature: {1}'.format(sensor.dht_type, temp))
        time.sleep(1)


if __name__ == '__main__':
    main()
```

> **Success**

```
pi@raspberrypi:~/Seed_Python_DHT/examples $ python dht_simpleread.py
DHT22, humidity 39.2%, temperature 29.1*
DHT22, humidity 39.2%, temperature 29.1*
DHT22, humidity 39.2%, temperature 29.1*
DHT22, humidity 39.1%, temperature 29.1*
DHT22, humidity 40.0%, temperature 29.1*
DHT22, humidity 39.9%, temperature 29.1*
DHT22, humidity 40.3%, temperature 29.1*
DHT22, humidity 42.0%, temperature 29.1*
```

You can quit this program by simply press `Ctrl` + `C`.

Play With Raspberry Pi (with GrovePi_Plus)

Hardware

Materials required

Raspberry pi	GrovePi_Plus	Temperature&Humidity Sensor Pro
Get One Now	Get One Now	Get One Now

- Step 1. Plug the GrovePi_Plus into Raspberry.
- Step 2. Connect Grove - Temperature&Humidity Sensor Pro to D4 port of GrovePi_Plus.
- Step 3. Connect the Raspberry to PC via USB cable.

Software

If this is the first time you use GrovePi, please do this part step by step. If you are an old friend with GrovePi, you can skip Step1 and Step2.

- Step 1. Setting Up The Software. In the command line, type the following commands:

```
sudo curl -kL dexterindustries.com/update_grovepi | bash
```

```
sudo reboot
```

```
cd /home/pi/Desktop
```

```
git clone https://github.com/DexterInd/GrovePi.git
```

For more detail about this part, please refer to Setting Software .

- Step 2. Follow Updating the Firmware to update the newest firmware of GrovePi.

> Note
> We firmly suggest you to update the firmware, or for some sensors you may get errors.

- Step 3. Configure the parameter

```
cd /home/pi/Desktop/GrovePi/Software/Python/
sudo nano grove_dht_pro.py
```

> **Note**
> The Grove - Temperature&Humidity Sensor and the Grove - Temperature&Humidity Sensor pro share the same python code which named `grove_dht_pro.py`. The only difference is that for the sentence `[temp,humidity] = grovepi.dht(sensor,blue)`. We use the parameter `blue` for Grove - Temperature&Humidity Sensor while we use `white` for the Grove - Temperature&Humidity Sensor pro. The default value is blue, so for this sensor you need to change the code.

Change the default parameter `[temp,humidity] = grovepi.dht(sensor,blue)` into `[temp,humidity] = grovepi.dht(sensor,white)`. Then the code should be like:

```python
import grovepi
import math
# Connect the Grove Temperature & Humidity Sensor Pro to digital port D4
# This example uses the blue colored sensor.
# SIG,NC,VCC,GND
sensor = 4  # The Sensor goes on digital port 4.

# temp_humidity_sensor_type
# Grove Base Kit comes with the blue sensor.
blue = 0   # The Blue colored sensor.
white = 1   # The White colored sensor.

while True:
    try:
        # This example uses the blue colored sensor.
        # The first parameter is the port, the second parameter is the type of sensor.
        [temp,humidity] = grovepi.dht(sensor,white)
        if math.isnan(temp) == False and math.isnan(humidity) == False:
            print("temp = %.02f C humidity =%.02f%%"%(temp, humidity))

    except IOError:
        print ("Error")
```

Then tap `Ctrl` + `X` to quit nano. Tap `Y` to save the change.

- Step 4. Run the following command to get the result.

```
sudo python grove_dht_pro.py
```

The result should be like:

```
pi@raspberrypi:~/GrovePi/Software/Python $ sudo python grove_dht_pro.py
temp = 22.90 C humidity =42.30%
temp = 22.90 C humidity =42.30%
temp = 22.90 C humidity =42.30%
temp = 22.90 C humidity =42.30%
temp = 22.90 C humidity =42.30%
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temp = 22.90 C humidity =42.30%
```

Schematic Online Viewer
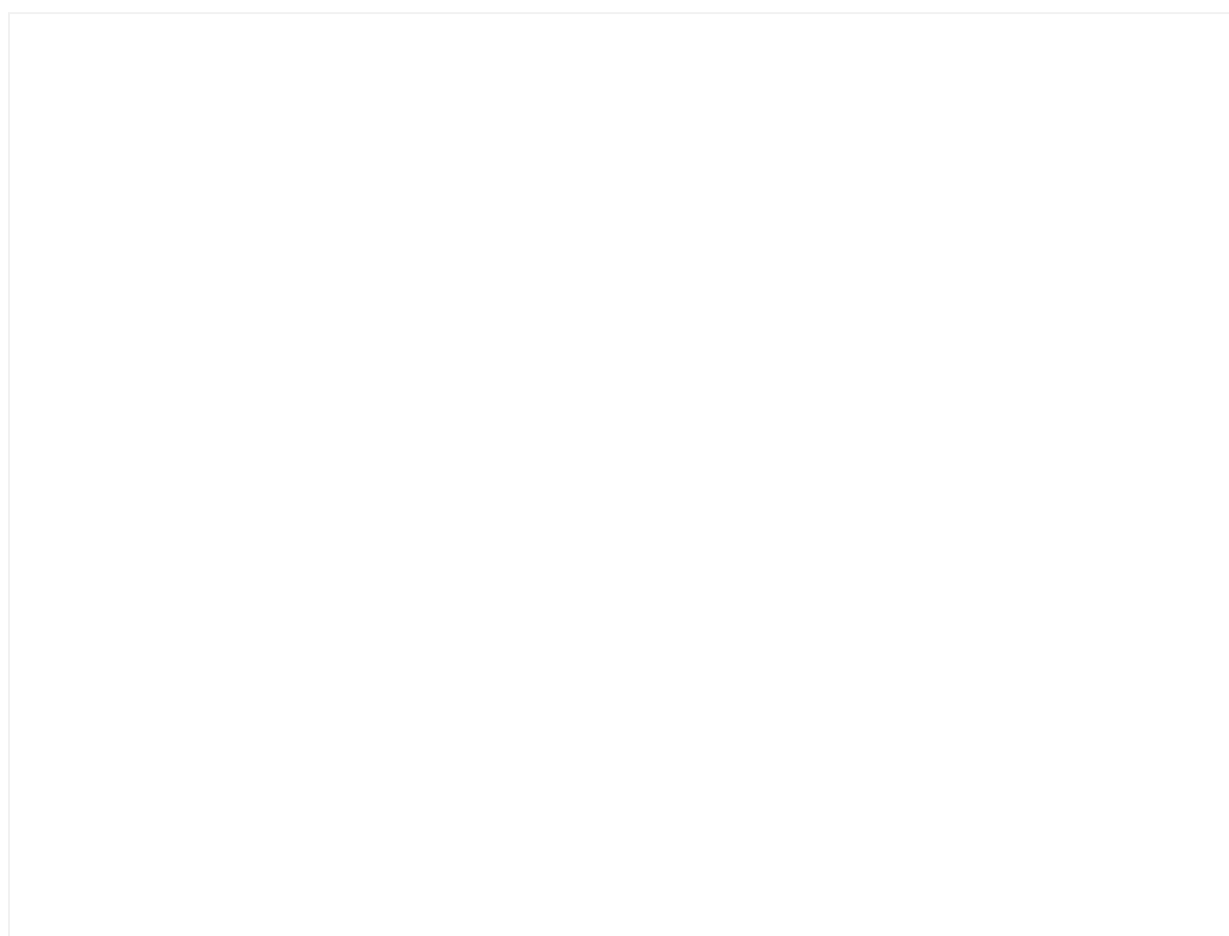
Resources

- [Zip] Temperature&Humidity Sensor Pro in eagle format
- [PDF] Temperature&Humidity Sensor Pro PCB in PDF format
- [PDF] Temperature&Humidity Sensor Pro Schematic in PDF format
- [Library] Temperature&Humidity Sensor Pro library
- [Datasheet] AM2302-CN.pdf
- [Datasheet] AM2302-EN.pdf