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Run Your Home on a Raspberry Pi

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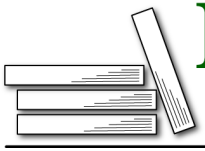

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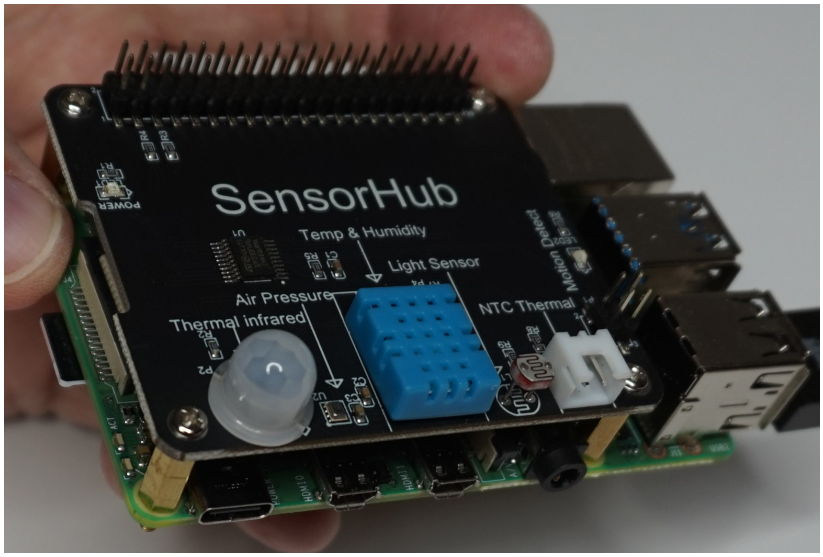
Seating the Sensor

The SensorHub package includes four metal posts that can help secure the SensorHub more permanently to the Pi. I suggest you test your SensorHub attached to the Pi's GPIO pins first before securing it with the posts. When you're satisfied with the long-term use of the SensorHub, you can make the installation more secure by screwing the posts in place. Look at how much more secure the SensorHub sits on my Pi 4 in the next photo.



When you power on the Pi with the SensorHub correctly attached, the SensorHub's red LED power indicator located in the upper-left quadrant on top of the SensorHub will remain constantly illuminated. You may also see a blue LED near the middle-right edge of the SensorHub occasionally turn on and off. This LED lights up whenever motion is detected within the last five seconds. You can verify this by waving your hand over the board to watch this detection occur.

Since we'll be using the Philips Hue platform to turn on and off a Hue smart plug connected to a fan (or other appliance that may be better suited for your needs), we'll be calling upon the `phue` third-party Python library. Install the library into your virtual environment:

```
$ sudo pip3 install phue
```

Before we can start sending commands to the Hue bridge, we have to register it first.

Bridge Registration

When you installed the Hue system, you needed to press the sync button on the top of the Hue bridge for your Hue smartphone app to talk to the unit. Philips has adopted a basic means of security to prevent anyone nearby from gaining unauthorized access to your Hue network. By pressing the button on the Hue bridge, you are authorizing the application requesting control access.

To do this for Python scripts running on the Pi, you first need to register with the bridge by connecting to it within thirty seconds after the Hue bridge button has been pressed. You'll also need to know the IP address of the Hue bridge on your network, which you should be able to identify from your network router's dashboard, similar to the way the Pi's IP and MAC address were identified back in Finding the Pi on Your Network, on page ?.

Create the following script in your huefan directory, name it register.py, and add the lines of Hue bridge registration code to this file:

huefan/register.py

```
1 from phue import Bridge
2 huebridge = Bridge('YOUR_HUE_BRIDGE_IP_GOES_HERE')
3 huebridge.connect()
```

Let's take a quick look at what this three-line Python script does.

❶ Using the from Python keyword, we can import a specific class or function from a module and assign it a to an instance variable. In this case, we import Bridge from the phue module for use in our script.

❷ We pass the IP address of our Hue bridge to Bridge and assign its result to the huebridge variable.

❸ As long as the button on the top of the Hue bridge was pressed a few seconds before this script is run, the Hue bridge will register our Pi and grant it the ability to control other Hue-registered devices on the network. Once you've successfully registered your Pi with the Hue bridge, there's no reason to call the connect() again unless you use a different Hue bridge or another Pi to run your Hue scripts on.

Replace the YOUR_HUE_BRIDGE_IP_GOES_HERE with the IP address of your Hue bridge. When you're ready, press the sync button on top of your Hue bridge and to allow it to automatically register new devices asking to register with it. In our case, this new device is our Pi running this script.

Execute the register.py script within thirty seconds of pressing the Hue bridge button. If you fail to run the script in time, you will have to press the Hue bridge button and run the registration script again.

```
$ python3 register.py
```

If no output appears after you execute the script, then you successfully registered your Pi with the Hue bridge. You can now use your Pi and the phue scripts you run on it to remotely control other Hue devices on your network.

If the script failed to connect(), it will provide details in the output errors. The most frequent error for not being able to register is using an incorrect IP address for the Hue bridge. This error is usually reported at the bottom of the error trace as a socket.gaierror: [Errno -2] Name or service not known. Fix the IP address and connectivity problem so that you can successfully register your Pi with the Hue bridge before proceeding.

Registered Devices

To confirm your effort was successful as well as identify the name and ID of the connected Hue smart plug, create and run the following listdevices.py script that will connect to your Hue bridge and enumerate a list of Hue accessories configured with the bridge:

huefan/listdevices.py

```
from phue import Bridge

huebridge = Bridge('YOUR_HUE_BRIDGE_IP_GOES_HERE')  ❶
lights = huebridge.lights                           ❷
for light in lights:                                ❸
    print(light.name)
```

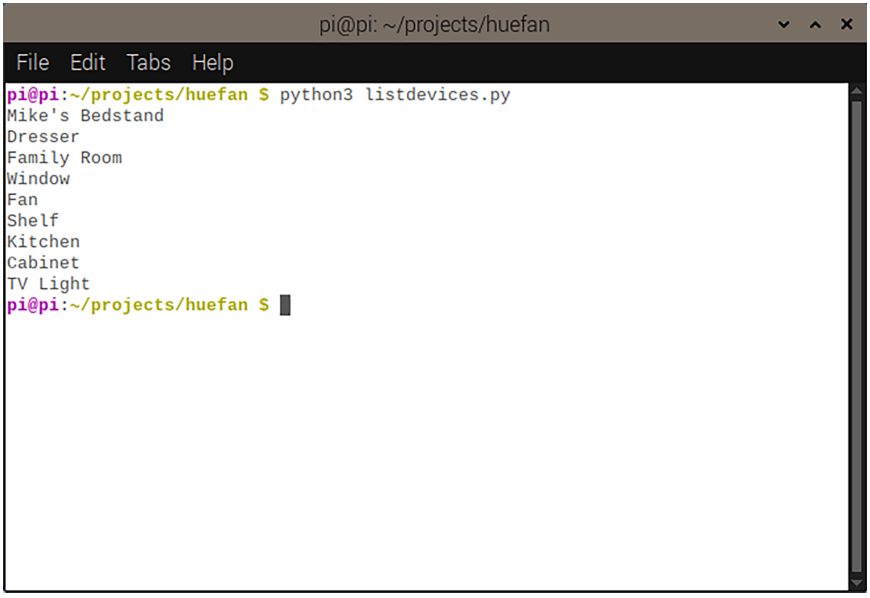
Let's take a quick look at how this script connects to your Hue bridge and identifies the other Hue devices it's able to manage.

❶ Here we pass the IP address of our Hue bridge into the huebridge object instance.

❷ Next, we interrogate the bridge lights collection and assign those details about the Hue smart bulbs, smart plugs, and other Hue-controllable accessories to the lights variable.

❸ Finally, we use a for loop to iterate over the lights collection and assign each item to the light variable. Then we print the name we assigned each of those devices via the Hue smartphone app.

The output of the script will list the names of the Hue lights, smart plugs, and accessories you have registered and named with your Hue bridge. Identify the name of your Hue smart plug from the list. In my case, I named my smart plug "Fan", a name I will use in the sample code. If you labeled your smart plug or light a different name using the Philips Hue app on your smartphone, be sure to replace 'Fan' in the code listings with the name of your Hue-labeled device. For example, here's the output shown after running the python3 listdevices.py command from within my Terminal window.



Now that we see our list of connected devices, we can turn them on or off using a single line of Python code.