

You have arrived at the NRC and are ready to demonstrate your ability to control a Raspberry Pi remotely using Adafruit IO. You sign in to your account at Adafruit IO. When the page opens, you are greeted with a message that the service will not be available for the next 24 hours. What is your alternate plan? How about VNC?

VNC is remote access software that permits you to connect to your Raspberry Pi, even over the Internet. While it is not an exact substitute for Adafruit IO, it can be used as your backup plan.

VNC is a remote desktop application. It allows you to see a copy of the Raspberry Pi desktop on your laptop computer. More importantly, it allows you to click on items on the remote desktop to control the Raspberry Pi, just the same as if you were controlling the Pi with mouse and keyboard connected to the Pi.

If you have a control system set up in Adafruit, and suddenly the service becomes unavailable, then you will need to develop a new strategy. If that strategy involves using VNC, then you will need to write Python programs that allow you to control your project directly from the Pi rather than by clicking buttons on the Adafruit IO page. If your plans include uploading data to Adafruit (*e.g.* temperature data), then you will need an alternate plan for that as well. Keep in mind that the GEAR web site will be available for upload of files.

There are two software packages to install: **VNC Server** and **VNC Viewer**. It is likely that you will want to control your RPi from your PC and not the other way around. In that case, VNC Server is installed on the RPi and VNC Viewer on your PC. If you want full control both ways, then you need to install both packages on your PC and the RPi.

### Installation of VNC Server on RPi

It is likely you already have VNC Server installed on your RPi, but issue commands below to make sure:

1. `sudo apt-get update`
2. `sudo apt-get install realvnc-vnc-server`

### Configure RPi to use VNC

1. In Desktop menu select **Preferences**, then **RPi Configuration**, then **Interfaces** tab, and set VNC to enabled.

### Create a VNC account

1. Go to this web page: <https://manage.realvnc.com/en/pricing>
2. Click on the **Activate** button for a Home type account (it is free)
3. Enter your email address in the appropriate slot on the page that opens and click the Next button.
4. Continue with the process until you have established your account. You will have to create a password during the process. **Make sure you don't forget your password!**

### Start VNC Server on your RPi

1. Click on the VNC icon (RPi desktop task bar, upper right of screen)
2. In the VNC Server window that opens, click its menu (upper right) and select **Licensing**.

3. In the Licensing window under **Options**, select Sign in to your RealVNC account to apply your subscription.
4. Click the Next button
5. Enter your email address and the password you created for the VNC account
6. Click the **Sign In** button
7. Then click the **Apply** button to finish the process
8. You will probably get a message about "Granted permissions without asking for a password." Nothing is wrong, just click the Close button, then the Done button.

Your RPi is now ready to receive a connection.

### Install VNC Viewer on your laptop

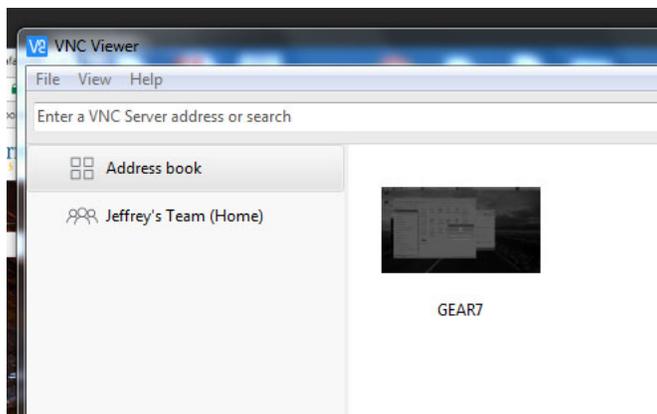
If you just want to test out connecting to your RPi, then you can use Mr. La Favre's laptop, which has the software installed. Eventually, you should install the software on your laptop, especially if you are going to take it to NRC.

1. Go to this page: <https://www.realvnc.com/en/connect/download/vnc/>
2. Click on **VNC Viewer** link (NOT the Download VNC Connect button)
3. Follow directions to install the software

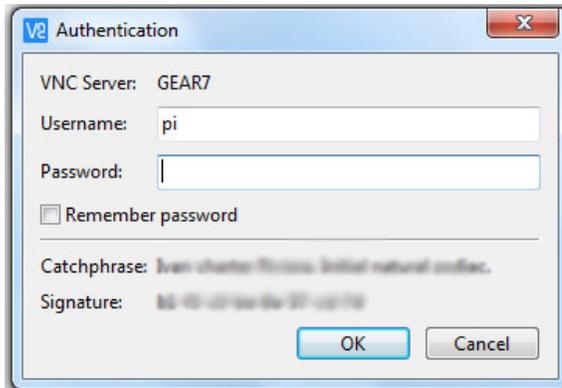
### Connecting to RPi Over Internet

You are now ready to connect to your RPi (make sure VNC Server is running on RPi).

1. Open VNC Viewer on your laptop computer
2. When it opens, click the **Sign In** button (upper right)
3. In the Sign In window, enter your email address and password for your VNC account
4. The VNC Viewer will now display devices available to connect (in illustration below, GEAR7 RPi). Click on device to initiate the connection process.



5. An Authentication window should appear. If you are trying to connect to an RPi, then you will need to put in the username, which should be **pi** (unless you changed it). Then put in the password for the RPi (NOT your VNC password, the RPi password).



The remote desktop of your RPi should now appear on your laptop screen. You have control of the RPi remotely. Try opening a file on the RPi and doing some other things, like issuing commands in the Terminal.

### Copy Text from RPi to your laptop

You can use copy and paste to retrieve text from a file on the RPi.

1. Open text file on RPi
2. Highlight text you want to copy
3. Do Ctrl + C on keyboard or use copy in Edit menu
4. Open a text file on your laptop and paste text into it.

### File Transfers

You can copy a file on the RPi to your laptop.

1. Click the menu of the VNC Server (upper right)
2. Select **File Transfer**
3. Click the **Send files** button
4. Select the file you want to copy to your laptop
5. Click the **OK** button
6. file will be copied to the desktop of your laptop

If the above procedure fails, keep in mind you have another alternative. You can start Filezilla on the RPi, upload the desired file to the GEAR web site, then start Filezilla on your laptop and download the file from the web site. This method can be used to transfer files both ways.