Or how to update the firmware, and connect to the Particle IDE and Cloud.

The setup for this device is mostly straight forward, with a couple of catches. Everything you need to know is contained in these four documents found at the Redbear Github repository.

<https://github.com/redbear/Duo/blob/master/docs/firmware_deployment_guide.md>

<https://github.com/redbear/Duo/blob/master/docs/devices_provisioning_guide.md>

<https://github.com/redbear/device-provisioning-helper>

<https://github.com/redbear/Duo/blob/master/docs/out_of_box_experience.md>

You need to download the system firmware here:

<https://github.com/redbear/Duo/tree/master/firmware/system/v0.3.1>

You only need duo-system-part1-v0.3.1.bin and duo-system-part2-v0.3.1.bin

You also need the three files found here:

<https://github.com/redbear/Duo/tree/master/firmware/dct>

And the wifi update found here:

<https://github.com/redbear/Duo/tree/master/firmware/wifi>

The first thing we do is put the device in DFU mode - by holding both buttons at powerup, release the reset button and wait for the LED to turn yellow then release the setup button.

Now - Follow the instructions found in the deployment guide.

Which are basicly -

1. Update the entire DCT using the [fac-dct-r1.bin](https://github.com/redbear/Duo/blob/master/firmware/dct/fac-dct-r1.bin), which includes the cloud public key. dfu-util -d 2b04:d058 -a 0 -s 0x8008000 -D fac-dct-r1.bin
2. After you updating the entire DCT, the device private key will generated automatically. You have to [provision the Duo to the cloud](https://github.com/redbear/Duo/blob/master/docs/devices_provisioning_guide.md)
3. Re-configure the WiFi credentials.

Update the server public key

dfu-util -d 2b04:d058 -a 1 -s 2082 -D server\_public\_key.der

#### **Update System Firmware**

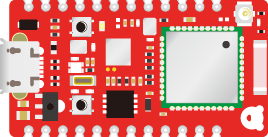
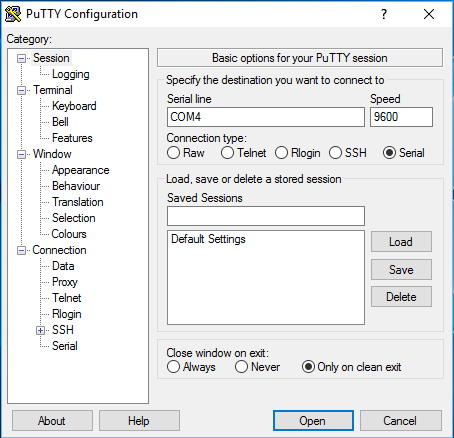
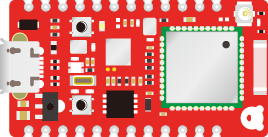
* Update system part 1:
* dfu-util -d 2b04:d058 -a 0 -s 0x8020000 -D duo-system-part1-vx.x.x.bin
* Update system part 2:
* dfu-util -d 2b04:d058 -a 0 -s 0x8040000 -D duo-system-part2-vx.x.x.bin

And finally update the WIFI

* Update Wi-Fi firmware:
* dfu-util -d 2b04:d058 -a 2 -s 0x180000 -D duo-wifi-r1.bin

At this point we go off script a little bit because we need to connect the device to the wifi and get the device ID - so we can reprovision it for Particle Cloud.

### **Using Serial Terminal**

1. Power on. Connect your Duo to computer directly via its Native USB port with micro USB cable (ensure that the cable has data exchangement capability). Then the on-board RGB LED will keep flashing blue, i.e. the Duo is in Listening Mode for you to set Wi-Fi credentials. You'll learn that the Duo is more versatile when it is in Listening Mode.
2. 
3. Start serial terminal
   * For Windows:
     + Please follow the [Windows Driver Installation Guide](https://github.com/redbear/Duo/blob/master/docs/windows_driver_installation_guide.md) to install the driver for Duo.
     + Install the [PuTTY](http://the.earth.li/~sgtatham/putty/latest/x86/putty.zip) serial terminal and start it. Change the Serial port to your one and press the "Open" button. You can also install other serial terminal, e.g. HyperTerminal, Tera Term, Arduino Serial Monitor and etc.
     + Note: If you are using Arduino Serial Monitor, before sending 'i', 'v' and 'w', the line ending should be set to "No line ending", otherwise, the ending character will be treated as the next input character. And before sending SSID, security type, cipher and password, the line ending should be changed to "New line". This is because the Duo will echo message upon received the 'i', 'v' and 'w' commands, but other input prompts should be ended with the '\n' character.
     + 
   * For OSX and Linux:
     + Start the Terminal and use the "screen" command. On Linux (e.g. Ubuntu), you may need to install screen by:
     + $ sudo apt-get install screen.
     + On OSX, type:
     + $ screen /dev/tty.usbmodemXXXXX, where XXXXX is your Duo device serial port.
     + On Linux, type:
     + $ screen /dev/tty.ACMX, where ACMX is your Duo device serial port.
     + If you are not sure about the serial port, you can list the device by:
     + OSX: $ ls /dev/tty.usbmodem\*
     + Linux: $ ls /dev/tty.ACM\*
     + If there is no such device, you may need to check your USB cable.
4. Check system firmware version. Type in 'v' on the terminal, it will print the version string, e.g.:
5. system firmware version: 0.2.4
6. In later chapter, you can check the system firmware change-log to decide if you need an update of the system firmware.
7. Fetch unique device ID. Type in 'i' on the terminal, it will print the unique 12-bytes device ID, e.g.:
8. Your device id is 3e00xxxxxxxx343530343432
9. In later chapter, the device ID will be used for claiming your Duo on the Particle Cloud, please have a copy of it.
10. Set Wi-Fi Credentials. Type in 'w' on the terminal, it will ask you to enter the SSID, Security type and password to associate to your AP. Sample input and output:
11. SSID: AP-01  
     Security 0=unsecured, 1=WEP, 2=WPA, 3=WPA2: 3  
     Password: YOUR\_PIN\_ONLY\_YOU\_KNOW  
     Thanks! Wait while I save those credentials...  
      
     Awesome. Now we'll connect!  
      
     If you see a pulsing cyan light, your device  
     has connected to the Cloud and is ready to go!  
      
     If your LED flashes red or you encounter any other problems,  
     visit https://www.particle.io/support to debug.  
      
     Particle <3 you!
12. If everything is ready, Duo will leave Listening Mode and try to connect to the AP with the RGB flashing green. If Duo connects to the AP successfully, it then performs a soft reset to restart. Otherwise, Duo will enter Listening Mode again for you to re-set the Wi-Fi credentials.
13. 
14. Note: If you are using PuTTY or other serial terminal, when the Duo performs a reset, it disconnect from the terminal and the serial port may not be valid any more. You need to close the serial port, then press the on-board RESET button and open the serial port again to restore the communication with Duo.

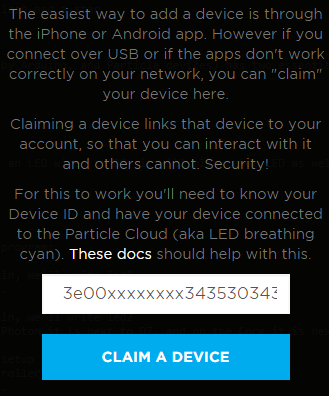
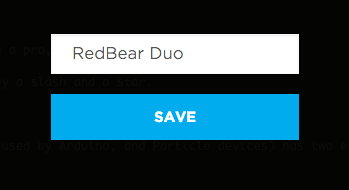
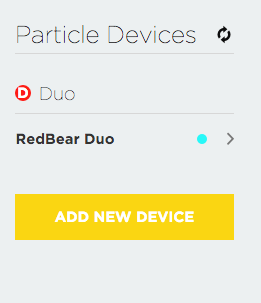
Once you reset the device, you should see it connect to your wifi - cyan (or light blue) led, but you’ll notice that the RED led also flashes this means that it can’t make a secure connection to the cloud and needs to be reprovisioned.

For that we need the provisioning helper script - FOLLOW all of the instructions on this page: <https://github.com/redbear/device-provisioning-helper>

Once that is done, you should be able to claim the device using the device id on the particle cloud.

### **Claim your Duo on the Partcile Cloud (Optional)**

We work closely with Particle team and the Duo for development purpose, can freely and easily access the Particle Cloud and benifit from the services and tools provided by Particle, e.g., Particle Web IDE, Particle Dashboard, Particle Event System and etc. If you want to benefit from these features, you have to work through the following steps to claim your Duo first.

* Make sure that the Duo is connected to the Particle Cloud, i.e. the RGB is breathing cyan. If it can not connect to the Cloud, please check out the [Duo Troubleshooting](https://github.com/redbear/Duo/blob/master/docs/troubleshooting.md) to fix it first before moving on.
* Go to [Particle Build](https://build.particle.io/). Creat an account if you don't have one yet, or just login.
* Navigate to the image tag at the left-bottom corner and click to switch to the devices view.
* Click on the "ADD NEW DEVICE" button.
* 
* Enter your Duo's device ID that you just got at step 3 and click on the "CLAIM A DEVICE" to claim your Duo. The device ID should be made up of lowercase HEX charaters.
* 
* If claimed successfully, give a name to your Duo and then press the "SAVE" button. Otherwise, please check out the [Duo Troubleshooting](https://github.com/redbear/Duo/blob/master/docs/duo_troubleshooting.md)
* [](https://github.com/redbear/Duo/blob/master/docs/duo_troubleshooting.md)
* Your Duo will be listed in "Other Devices". Never mind, refresh the whole page, you will see it is now under the "Duo" lable. The breathing cyan dot indicates your Duo is online.
* 

It should be noted that even after I was able to connect, I still got a red led error (it was a slightly different pattern) - and to clear that I used Particle cloud to send the “BLINK” example sketch to the device, and everything seemed to work quite well.