Flashing your SensorStation's Compute Module

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Updating your SensorStation's Disk Image

You can use your `CTT SensorStation` to burn a new operating system onto the compute module using a micro USB cable attached to your computer. Here is an article on raspbian's website with general instructions: Flashing the Compute Module eMMC. This page will summarize the steps needed to burn a New CTT SensorStation image to your compute module using the SensorStation hardware.

Why flash my compute module?

While CTT offers many over-the-air updates to your `CTT SensorStation` sometimes you just need a fresh start, or maybe you haven't been incrementally updating the source code and want to do so after a full stable release. You've found the right place to learn how!

SensorStation Image Downloads

For Version 1 SensorStations

V1 SensorStation Current Stable Image *OTA Update enabled. Station health reports. RTL-SDR support. Pickup new Nodes / Tags with updated protocol.* Download Station Image

For Version 2 & 3 SensorStations

V2 & V3 SensorStation Current Stable Image *Records Tag, GPS, SensorGnome, and Telemetry data. Monthly reboot on the 3rd of the month.* Download Station Image

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Software Requirements

You will need drivers for your computer to recognize the module as a new drive, and software to burn new images to disk.

All Users

- All users require software to burn an image such as Raspberry Pi Imager or balenaEtcher

Windows Drivers

- Drivers - Download and run the Windows Installer which will install the `rpiboot.exe`.

Linux / Mac

Linux / MAC users will have to clone the rpiboot source code, compile and run the rpiboot.exe file that is generated. Detailed instructions for **Linux** here.

For **Mac**, follow these directions:

1. Install `Homebrew`, which is a package installer for **Mac**.
    - Directions here: https://brew.sh
    - Or you can paste this code into `Terminal`:

```
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install.sh)"
```

Then install the libusb libraries:

```
brew install libusb
```

2. From within Terminal, navigate to your preferred directory.

Tip: I tend to use Dropbox, so I use the `cd` *command to* ***c****hange* ***d****irectory into my* `Dropbox` *folder:* `cd Dropbox`

Once you are in your preferred directory, run the following code to install the USBBoot code in `Terminal`

```
git clone --depth=1 https://github.com/raspberrypi/usbboot
```

Then move into the `usbboot` directory:

```
cd usbboot
```

Now make the `rpiboot` installer:

```
make
```

At this point, you now have a standalone executable called `rpiboot` in the `usbboot` folder. You can move that executable anywhere you want so it's convenient for using again in the future.

Additionally, once you have moved the `rpiboot` executable, the `usbboot` folder can be trashed as its contents are only useful for making the `rpiboot` program. **From now on, if you need to flash more compute modules, you can start with running `rpiboot` and do not need to re-do steps 1 and 2 above.**

If you are still in the `usbboot` directory, you can now run run rpiboot with the following command. Otherwise use the `CD` command in `Terminal` to change directory to wherever you moved `rpiboot`.

```
./rpiboot
```

At this point you should see a message in your terminal that says something to the effect of:

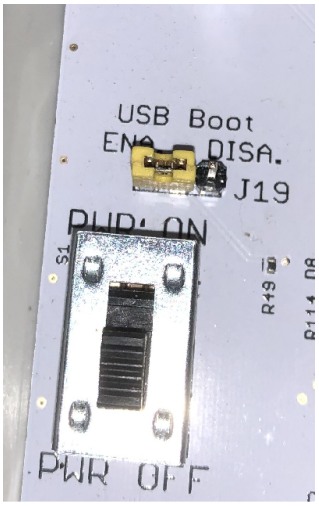
```
Waiting for BCM2835/6/7/2711...
```

This indicates that the USB port has been opened, and your computer is waiting to see a Raspberry Pi on that port. **Now complete Steps 1 and 2 below, and skip steps 3 and 4.**

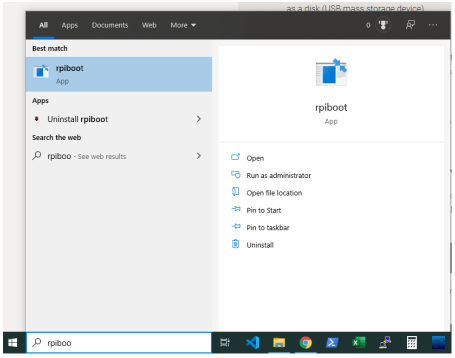
Steps to Burn a New Image

1. Ensure the SensorStation power is turned `OFF`
2. Move the **USB Boot Jumper Pin** to the `ENABLED` position (to the `left` 1 pin, for horizontally placed pins, or `down` 1 pin for vertically placed pins).

- *Note: The location of your USB Boot Jumper may vary, and is typically vertically placed near the lower left corner of the Raspberry Pi module on V1 boards, or horizontally placed just above the power switch on V2 boards.*



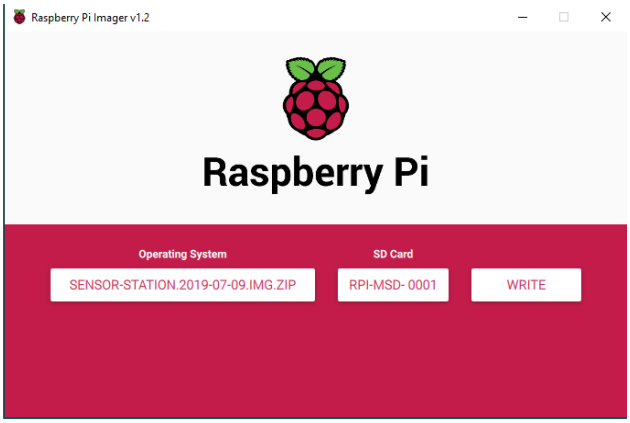
3. Run `rpiboot.exe` which was installed from the previous step. From windows, you can search `rpiboot` to find it.



4. Running `rpiboot` will pop up a console showing a wait message waiting for the module to be detected:

5. Plug the micro-USB cable into the SensorStation, and into your computer.

6. Power on the SensorStation.
7. The dialog box from `rpiboot` should disappear after displaying some messages and the module will be available as a new hard drive. (**Do not auto-fix as windows may suggest!**)
8. Run `Raspberry Pi Imager`



9. Click the button under `Operating System` and navigate to the SensorStation image file you saved (it's a `.zip` file), and select it.
10. Click the button under `SD Card` and select your Raspberry Pi compute module as the target. `example: RPi-MSGD- 0001 - 7.8 GB`
11. Click the `WRITE` button to flash the disk image.
    - This will take a while, but once the image is written you will get a success message and the process is complete.
12. Move the **USB Boot Jumper Pin** to the `DISABLED` position (to the `right` 1 pin, for horizontally placed pins, or `up` 1 pin for vertically placed pins).
13. Restart your SensorStation and you're good to go!

Of course, as always, if you have any issue please don't hesitate to email us at support@celltracktech.com.