**Device Modes**

Now that we've gone over connecting your device, we're going to review the different modes for your Electron. We suggest that you work through this section, putting your device in the different listed modes to familiarize yourself with them.

**Standard Modes**

**Connected**

When it is breathing cyan, your Electron is happily connected to the Internet. When it is in this mode, you can call functions and flash code.

**OTA Firmware Update**

If your Electron is blinking magenta, it is currently loading an app or updating its firmware. This state is triggered by a firmware update or by flashing code from the Web IDE or Desktop IDE. You might see this mode when you connect your Electron to the cloud for the first time.

Note that, if you enter this mode by holding MODE on boot, blinking magenta indicates that letting go of the MODE button will enter safe mode to connect to the cloud and not run application firmware.

**Looking For Internet**

If your Electron is blinking green, it is trying to connect to the internet. If you already setup the cellular connection, give your device a few seconds to connect and start breathing cyan.

If you haven't connected your Electron to a cellular tower yet, please wait up to ten minutes. If it takes longer than that, refer to [cellular troubleshooting section](https://docs.particle.io/support/troubleshooting/common-issues/electron/#blinking-green).

**Cellular Off**

If your Electron is breathing white, the cellular module is off. You might see this mode if:

* You have set your module to MANUAL or SEMI\_AUTOMATIC in your user firmware
* You have called Cellular.off() in your user firmware

**Listening Mode**

When your Electron is in Listening Mode, it is waiting for your input to connect to a cellular tower. Your Electron needs to be in Listening Mode in order to begin connecting with the Mobile App or over USB.

To put your Electron in Listening Mode, hold the MODE button for three seconds, until the RGB LED begins blinking blue.

**Safe Mode**

Safe mode connects the Electron to the cloud, but does not run any application firmware. This mode is one of the most useful for development or for troubleshooting. If something goes wrong with the app you loaded onto your device, you can set your device to Safe Mode. This runs the device's system firmware but doesn't execute any application code, which can be useful if the application code contains bugs that stop the device from connecting to the cloud.

**The Electron indicates that it is in Safe Mode with the LED breathing magenta.**

To put your device in Safe Mode:

1. Hold down BOTH buttons
2. Release only the RESET button, while holding down the MODE button.
3. Wait for the LED to start blinking magenta
4. Release the MODE button

The device will itself automatically enter safe mode if there is no application code flashed to the device or when the application is not valid.

**DFU Mode (Device Firmware Upgrade)**

If you wish to program your Electron with a custom firmware via USB, you'll need to use this mode. This mode triggers the on-board bootloader that accepts firmware binary files via the [dfu-utility.](https://s3.amazonaws.com/spark-assets/dfu-util-0.8-binaries.tar.xz) (Note: Some users reported issues with dfu-util on a USB3.0 ports on Windows. Use a USB2.0 port if the USB3.0 port doesn't work.)

Installation tutorial can be found [here.](https://docs.particle.io/guide/tools-and-features/cli/)

And a usage guide [here.](https://docs.particle.io/reference/cli/)

To enter DFU Mode:

1. Hold down BOTH buttons
2. Release only the RESET button, while holding down the MODE button.
3. Wait for the LED to start flashing yellow (it will flash magenta first)
4. Release the MODE button

The Electron now is in the DFU mode.

**Firmware Reset**

*Since 0.6.0*

The Electron can store a backup copy of any desired user firmware in flash memory at address 0x080A0000, separate from user flash memory which is located at 0x08080000. This backup copy of firmware can be restored to user memory with a button sequence that is only available when the backup copy flash memory contains a valid firmware image. To program your Electron with a backup copy of user firmware via USB, you'll need to put the Electron in [DFU Mode](https://docs.particle.io/guide/getting-started/modes/#dfu-mode-device-firmware-upgrade-) and run this command: particle flash --factory user-backup-firmware.bin

A CLI installation tutorial can be found [here.](https://docs.particle.io/guide/tools-and-features/cli/)

And a usage guide [here.](https://docs.particle.io/reference/cli/)

To enter Firmware Reset Mode:

1. Hold down BOTH buttons
2. Release only the RESET button, while holding down the MODE button.
3. Wait for the LED to start flashing green or white (it will flash magenta, then yellow first)
4. Release the MODE button

**Factory Reset**

Factory reset is not available on the Electron, but not to worry! If you are experiencing problems with your application firmware, you can use [Safe Mode](https://docs.particle.io/guide/getting-started/modes/electron/#safe-mode) to recover.

**Troubleshooting Modes**

These modes let you know about more atypical issues your Electron might be exhibiting. Use this section to troubleshoot strange colors you might see from your Electron.

**Cellular Module Not Connected**

If the Cellular module is on but not connected to a cellular tower, your Electron will be breathing blue. Note that this will be dark blue and not cyan.

**Cloud Not Connected**

When the Electron is connected to a cellular network but not to the cloud, it will be breathing green.

This can be caused by the currently running application firmware which may interfere with the cloud maintenance tasks which are usually executed between iterations of loop() or via an explicit call of [Particle.process()](https://docs.particle.io/firmware/#particle-process-). That commonly happens when the code blocks for more than 10 seconds. In addition to regularly allowing for cloud maintenance (via dropping out of loop() and/or calling Particle.process()) you can take manual control of the [connection](https://docs.particle.io/reference/firmware/#cloud-functions), choose a better suited [SYSTEM\_MODE](https://docs.particle.io/reference/firmware/#system-modes) and/or opt for [SYSTEM\_THREAD(ENABLED)](https://docs.particle.io/reference/firmware/#system-thread). To correct the "offending" firmware you may need to flash new firmware either via USB or [Safe Mode](https://docs.particle.io/guide/getting-started/modes/#safe-mode).

**Bad Public Key**

When the server public key is bad, the Electron will blink alternately cyan and red.

**Red Blink Basic Errors**

Blinking red indicates various errors.

* 2 red blinks: Could not reach the internet.
* 3 red blinks: Connected to the internet, but could not reach the Particle Cloud.
* Blinking "orange": This sometimes is seen as yellow or red and indicates bad server keys. To fix this issue, use the Particle CLI to restore the server keys using particle keys server in your terminal window, while having the device in DFU mode.

**Red Flash SOS**

Is your Electron blinking red? Oh no!

A pattern of more than 10 red blinks is caused by the firmware crashing. The pattern is 3 short blinks, 3 long blinks, 3 short blinks (SOS pattern), followed by a number of blinks that depend on the error, then the SOS pattern again.

[Enter safe mode](https://docs.particle.io/guide/getting-started/modes/electron/#safe-mode), tweak your firmware and try again!

There are a number of other red blink codes that may be expressed after the SOS blinks:

1. Hard fault
2. Non-maskable interrupt fault
3. Memory Manager fault
4. Bus fault
5. Usage fault
6. Invalid length
7. Exit
8. Out of heap memory
9. SPI over-run
10. Assertion failure
11. Invalid case
12. Pure virtual call
13. Stack overflow

The two most common ones are:

**Hard Fault (1 blink between 2 SOS patterns)**

**Out of heap memory (8 blinks between 2 SOS patterns)**

If your Electron crashes repeatedly with an SOS code, first try recovering with [Safe Mode](https://docs.particle.io/guide/getting-started/modes/#safe-mode) and flashing Tinker with the CLI to see if it was something recently added in your user application.

particle flash <mydevice> tinker

If it's not possible to enter Safe Mode, your system firmware may be corrupted. Try putting your Electron into [DFU Mode](https://docs.particle.io/guide/getting-started/modes/#dfu-mode-device-firmware-upgrade-) and flashing the system firmware locally over USB (and optionally flash the Tinker application) with:

particle update

particle flash --usb tinker

Don't forget that the [community forum is always there to help](https://community.particle.io).