Camera Axe 6 Firmware Update Guide

The Camera Axe 6 actually has two different processors that must be updated for each release. One of these processors (Esp8266) controls wifi communications and in this guide we'll call this the Esp8266. The other processor (Sam3x) handles the modules and camera triggering. We'll we'll call this one Sam3x.

In the future I may add a simpler method of updating the CA6 which uses binaries, but for now the only supported way of updating the CA6 involves building the binaries from source. This guide will walk you through the steps needed to do this.

You will need a PC running Windows, Mac, or Linux to do this update.

Summary of Options

Sam3x

- Standard Update - The only option here is updating with a USB cable. This method is very reliable.

Esp8266

- OTA Update - The over the air (OTA) update option lets you update the wifi processor without any cables. This option is faster than the other methods and easy if it works. It only works if you have a good firmware installed so if you had a failed update attempt this option won't work. It can also fail if the wifi network is busy so if this option doesn't work try another option.
- USB Update - Loading via usb cable loads the firmware using the same standard USB cable used to upload the firmware for the trigger processor. Reliability of this is not perfect, but it should work if you try it a few times.
- FTDI Update - Loading via an FTDI cable. This option requires buying a specialized cable like this one. This method is very reliable.

The ESP8266 does seem to fail updates without notification sometimes. One way to tell it failed is if the LED on the CA6 for wifi connection does not turn on after programming then the install has failed.

Environment Setup

1. Install the latest Arduino IDE (1.8.5 or later) from this page. Note that the Arduino Web Editor version won't work since we are using hardware not yet supported by it.
2. Open the Arduino IDE application.
3. Goto File->Preferences and in the field for additional board manager URLs add this link: http://arduino.esp8266.com/stable/package_esp8266com_index.json

4. Goto Tools->Board:->Board Manager… and towards the top of the list you'll see "Arduino SAM Boards (32-bits ARM Cortex-M3)". Click on that and install the latest version (1.6.11 or later). This will download and install files needed for the CA6 trigger processor.
5. Again goto Tools->Board:->Board Manager… and towards the bottom of the list you'll see "esp8266". Click on that and install the latest version (2.4.1 or later). This will download and install files needed for the the CA6 wifi processor.
6. Recent versions of Windows/Mac/Linux should not need drivers. Turn the CA6's power switch to the left (USB) and plug it into a USB port on your computer. If it detects an Arduino Due is connected to a com port you have the drivers. If the device is not recognized follow the directions here to install drivers.
7. Install The ESP8266FS tool.
    - Download the tool
    - Unpack the tool into `tools` directory (the path will look like `Documents/Arduino/tools/ESP8266FS/tool/esp8266fs.jar`)
    - Restart Arduino IDE
8. (Wifi Processor OTA Update) - If you want to use OTA (over the air) updates on the wifi processor. Then you need to install Python 2.7 (3.x will not work).

Get Latest Version of CA6 Software

1. Go to this page for the latest stable release.
    - Alternately developers can get a version from github.
    - Note prior to release you should use the copy on github will need to get access from Maurice.
2. Unzip the files and put them wherever you like to store files.
3. In the Arduino IDE goto File->preferences and there is a field called "Sketchbook Location". Open that folder on your desktop. In that folder there is another folder called "Libraries". Into that Libraries folder copy all the folders located in the CameraAxe6/Libs that you just extracted from the zip (CAEsp8266, CALed, CAPacket, …).

Sam3x Update (Standard Update)

1. Turn the CA6's power switch to the left (USB) and plug it into a USB port on your computer.
2. In the Arduino IDE application goto File->Open and select the file CameraAxe6/Sam3x/CA6/CA6.ino
3. Goto Tools->Board: and select "Arduino Due (Native USB Port)".
4. Goto Tools->Port: and it will list all the connected devices. Select the one with "Arduino Due" in the name.

    - Note if you ever get the CA6 in a really bad state (either a failed firmware update or you were writing your own code for it and got it into a hard crashing state then it's possible it won't connect. To fix this you need to press the "Erase" button for 1 second. Then power off the CA6 and power it back on. Now it will have a different com port with a different name (bossa). You can now use this com port to update it. After that power the device off and on again and it should be back to the arduino due com port.
5. Goto Sketch->upload and the new firmware should be successfully loaded onto the trigger processor.

Esp8266 (OTA Update)

1. Power on the CA6 and let it get connected to the same wifi network the computer running the Arduino IDE.
2. In the Arduino IDE application goto File->Open and select the file CameraAxe6/Esp8266/Esp8266.ino
3. Goto Tools->Board: and select "Generic ESP8266 Module".
4. Goto Tools->Flash Mode and select "DOUT"
5. Goto Tools->Flash Size and select "4M (1M SPIFFS)"
6. Goto Tools->Reset Method and select "drtset"
7. Close the Arduino IDE and open it after the CA6 is connected to the wifi network (blinking green). If you don't do this the name doesn't show up for step 6.
    - Note this step isn't always necessary so you can skip to step 6 and only do this if the IP address doesn't show up there.
    - When you reopen the connection all the settings you made above should be remembered. The only time they aren't is if you have multiple Arduino IDE instances running. If doing this then the last one you close is the one that has it's settings remembered and if you do that here you'll need to reset the settings listed earlier.
8. Goto Tools->Port: and select the IP address which should be shown just below the com ports.
9. Goto Sketch->upload and the new firmware should be successfully loaded onto the wifi processor.
10. Wait for the CA6's wifi connection indicator to start blinking green.
11. Select Tools->ESP8266 Sketch Data Upload. This loads all the static files like the webpage onto the esp8266.

Esp8266 (USB Update)

1. Plug the provided USB cable into the CA6. Plug the other end of this cable into a USB port on your computer. Make sure the CA6 switch is set to USB power.

2. In the Arduino IDE application goto File->Open and select the file CameraAxe6/Esp8266/Esp8266.ino
3. Goto Tools->Board: and select “Generic ESP8266 Module”.
4. Goto Tools->Flash Mode and select “DOUT”
5. Goto Tools->Flash Size: and select “4M (1M SPIFFS)”
6. Goto Tools->Reset Method and select “drtset”
7. Goto Tools->Port: and it will list all the connected devices. Select the com port for your USB cable. If you aren’t sure which one it is unplug it and look at the list to see which one was removed. Then plug it back in and select it.
8. To get the wifi processor into a state where it can be reprogrammed. Turn off the power for the CA6. Take off the CA6 battery cover. Press the program button located under the battery cover and while holding that button turn on the power for the CA6. You’ll see the camera port leds flash quickly 3 times indicating the wifi processor is ready to be reprogrammed.
9. Goto Sketch->upload and the new firmware should be successfully loaded onto the wifi processor.
10. Repeat step #7 to get it back in programming mode. Then select Tools->ESP8266 Sketch Data Upload. This loads all the static files like the webpage onto the esp8266.
    - I’ve found this doesn’t work reliably so you might want to do the OTA update for this step.
12. Turn off the power for the CA6 after uploading. This is required and if you don’t do it you will be able to connect to the wifi page, but no cameras will trigger.

Esp8266 (FTDI Update)

1. There are 4 screws holding the case of the CA6 on. Unscrew those to get access to the 6 pin wifi programming port. Plug the provided FTDI cable into that port. Making sure the black wire matches the word “Black” on the pcb (some ftdi boards will call this Gnd). Plug the other end of this cable into a USB port on your computer. Power on your CA6.
2. In the Arduino IDE application goto File->Open and select the file CameraAxe6/Esp8266/Esp8266.ino
3. Goto Tools->Board: and select “Generic ESP8266 Module”.
4. Goto Tools->Flash Mode and select “DOUT”
5. Goto Tools->Flash Size: and select “4M (1M SPIFFS)”
6. Goto Tools->Port: and it will list all the connected devices. Select the com port for your FTDI cable. If you aren’t sure which one it is unplug it and look at the list to see which one was removed. Then plug it back in and select it.
7. To get the wifi processor into a state where it can be reprogrammed. Turn off the power for the CA6. Take off the CA6 battery cover. Press the program button located under the battery cover and while holding that button turn on the power for the CA6. You’ll see

the camera port leds flash quickly 3 times indicating the wifi processor is ready to be reprogrammed.

8. Goto Sketch->upload and the new firmware should be successfully loaded onto the wifi processor.
9. Repeat step #6 to get it back in programming mode. Then select Tools->ESP8266 Sketch Data Upload. This loads all the static files like the webpage onto the esp8266.