Updating the Cycle Analogger's Firmware (Ubuntu)

Last Updated: 31 March 2011, MRVass

This document describes how to update the firmware on a Cycle Analogger to take advantage of new features and any relevant bug fixes. This is done through a special USB programming mode, accessible via a programming button included on every Cycle Analogger. To access this programming mode, you must get the appropriate software running on your computer, and once this is done you can simply plug your Cycle Analogger into your computer's USB port in programming mode, and run the included script (or enter the commands contained inside from a command line) to update its firmware.

Step 1: Unpack and Modify Atmel's "Flip" Software

To flash the Cycle Analogger, you must first unpack Atmel's "Flip" software onto your system, available at http://www.atmel.com/dyn/products/tools_card.asp?tool_id=3886). The Linux version is named "FLIP 3.2.1 for Linux x86". It should run with the instructions provided by Atmel on Red Hat Linux, but for Ubuntu some extra modifications are required.

Unpack Atmel Flip wherever you would like. From there, you can copy the bash script included with the flash kit, flashCA.sh, to [Flip extraction directory]/bin/. To use it, you will need to edit two variables used by the script, FLIP_HOME and JAVA_HOME, and change out the libatlibusbdfu.so file included with Atmel Flip with the file included with our flash kit (this has been modified in a hex editor to work with Ubuntu).

FLIP_HOME is the filepath to the folder that the script is in, [Flip extraction directory]/bin/. Please fill this in to match where you put the Atmel Flip bin folder on your system.

JAVA_HOME is the location of your Java Runtime Environment, wherever that has been installed. You should be able to find it by running:

```
ls -R / | grep "/lib/i386/client"
```

...which (slowly) searches your entire filesystem from your system's root directory for anything with "/lib/i386/client" in the directory path, one entry of which will hopefully be your java install folder. On Ubuntu 10.10, this path is by default "/usr/lib/jvm/java-6-openjdk/jre".

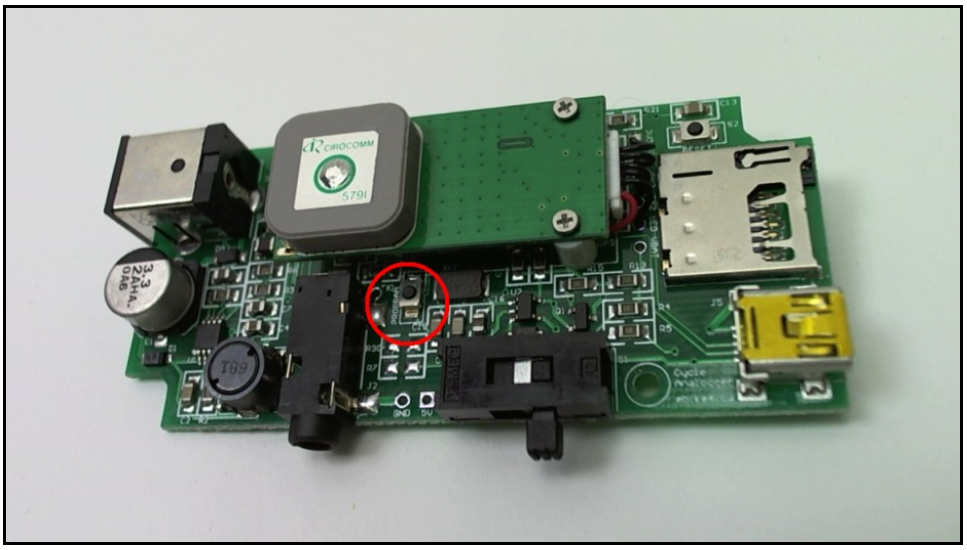
Once these two variable are set, the only thing left to do is to overwrite the file libatlibusbdfu.so in [Flip extraction directory]/bin/ with the file included with the flash kit. If you would like to modify the library file with a hex editor yourself, the variable to change is ".USB_DEVFS_PATH", which is set to "/sys/bus/usb" (this works on Red Hat Linux), but needs to be "/dev/bus/usb" for Ubuntu. For this task the author could recommend the hex editor Bless, which has a nice character string search feature to find this string in the file, and is available in the Synaptic Package Manager on Ubuntu.

You can also change your udev rules to allow normal user access to the programming device, but since sudo works and is required to enact that change to user access, it will not be covered in the scope of this document.

Step 2: Place the Cycle Analogger into Programming Mode

To place the Cycle Analogger into programming mode, you will have to disassemble the Cycle Analogger by removing the two black case screws, take off the back plate, then press and hold down the programming button (near the Cycle Analyst barrel jack) when plugging the device into your computer's USB port while the power switch is set in Mass Storage mode.

You can also plug the Cycle Analogger into your computer's USB port, then move the power switch from its middle position to its Mass Storage mode position while holding down the programming button. The button, with the power switch in the appropriate position, is shown in the picture below:



To check that the device is properly registered with your system, you can type the command “lsusb”, which lists all your usb devices. You should see an entry for “ID 03eb:2ff6 Atmel Corp”. If not, please ensure your USB ports are working correctly. You may have to run lsusb as a super user (sudo) to have the device show up.

Step 3: Run the Firmware Update Script

Once the Cycle Analogger is properly registered on your USB port, and the script is set up, you can simply run the bash script (flashCA.sh) as a super user by using the command “sudo bash flashCA.sh”. The script consists of a number of commands using “**batchisp3**”, the program included with Atmel Flip to communicate with the Atmel microchip used in the Cycle Analogger, in order to rewrite its USB bootloader defaults and install the new firmware.

If this is done from a command window, you will see multiple sets of programming status information from batchisp3, with everything marked as a PASS, similar to this:

```
AT32UC3B0128 - USB - USB/DFU


Device selection..................... PASS
```

```
Hardware selection..................... PASS
Opening port........................... PASS
Reading Bootloader version............. PASS 1.0.2
Erasing................................ PASS
Selecting FLASH........................ PASS
Blank checking......................... PASS 0x00000   0x1ffff
Parsing ELF file....................... PASS uc3b1128-
grindatalogger_standalone.elf
WARNING: The user program and the bootloader overlap!
Programming memory..................... PASS 0x00000   0x0ee7b
Verifying memory....................... PASS 0x00000   0x0ee7b

Summary:  Total 10   Passed 10   Failed 0
```

If the script closes successfully, then your Cycle Analogger will be updated and running in Mass Storage mode. Congratulations! If not, please try to place your Cycle Analogger into programming mode again by following Steps 2 and 3 above.

Please contact us if any additional assistance is required. Otherwise, please enjoy the enhanced features of your new, updated Cycle Analogger!

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