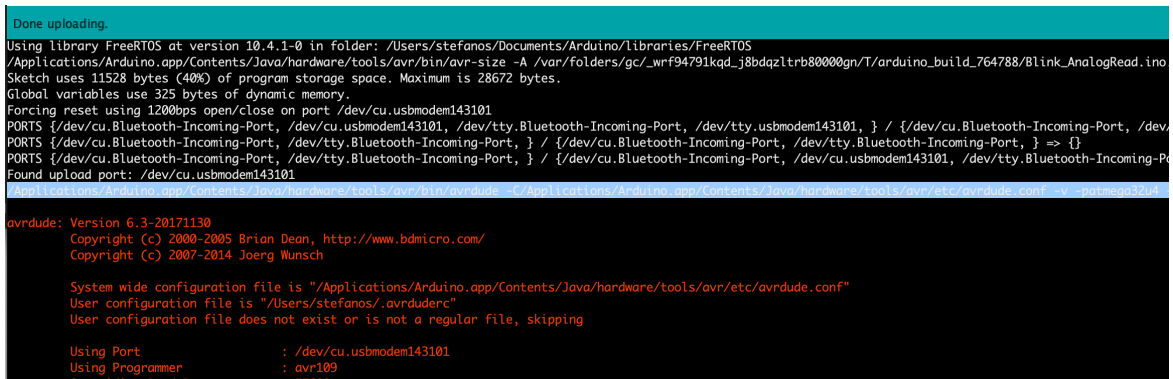


Flashing GW firmware for SoRTES 2020 Project

For Mac:

1. Open Arduino IDE
2. Top left on taskbar: Arduino -> Preferences
3. Check the box next to "Show verbose output during: upload".
4. Sketch > Upload
5. After the upload finishes, examine the contents of the black console window at the bottom of the Arduino IDE window. There, you will find the command the Arduino IDE used to flash the compiled binary file. You can copy that command, as shown in Figure 1.
6. Note that you need to modify the command to specify to the right path where your .hex file is stored. In my case, the modified command was:
`/Applications/Arduino.app/Contents/Java/hardware/tools/avr/bin/avrdude -C/
Applications/Arduino.app/Contents/Java/hardware/tools/avr/etc/avrdude.conf -v -
patmega32u4 -cavr109 -P/dev/cu.usbmodem141201 -b57600 -D -Uflash:w:/Users/
stefanos/Downloads/SorTeS_GW07.hex:i`



```
Done uploading.
Using library FreeRTOS at version 10.4.1-0 in folder: /Users/stefanos/Documents/Arduino/libraries/FreeRTOS
/var/folders/gc/_wrf94791kqd_j8bdqzltrb80000gn/T/arduino_build_764788/Blink_AnalogRead.ino
Sketch uses 11528 bytes (40%) of program storage space. Maximum is 28672 bytes.
Global variables use 325 bytes of dynamic memory.
Forcing reset using 1200bps open/close on port /dev/cu.usbmodem143101
PORTS {/dev/cu.Bluetooth-Incoming-Port, /dev/cu.usbmodem143101, /dev/tty.Bluetooth-Incoming-Port, /dev/tty.usbmodem143101, } / {/dev/cu.Bluetooth-Incoming-Port, /dev/
PORTS {/dev/cu.Bluetooth-Incoming-Port, /dev/tty.Bluetooth-Incoming-Port, } / {/dev/cu.Bluetooth-Incoming-Port, /dev/tty.Bluetooth-Incoming-Port, } => {}
PORTS {/dev/cu.Bluetooth-Incoming-Port, /dev/tty.Bluetooth-Incoming-Port, } / {/dev/cu.Bluetooth-Incoming-Port, /dev/cu.usbmodem143101, /dev/tty.Bluetooth-Incoming-Port, /dev/cu.usbmodem143101, }
Found upload port: /dev/cu.usbmodem143101

avrdude: Version 6.3-20171130
Copyright (c) 2000-2005 Brian Dean, http://www.bdmicro.com/
Copyright (c) 2007-2014 Joerg Wunsch

System wide configuration file is "/Applications/Arduino.app/Contents/Java/hardware/tools/avr/etc/avrdude.conf"
User configuration file is "/Users/stefanos/.avrduderc"
User configuration file does not exist or is not a regular file, skipping

Using Port : /dev/cu.usbmodem143101
Using Programmer : avr109
Using Programmer : avr109
```

Figure 1: The command you need to copy from Arduino IDE output for Mac.

7. Open up a Terminal, copy paste your modified command and hit Enter. Do note that you need to be clicking the “reset” button on the device as your command is being executed in the terminal, in order for the upload to be successful. The terminal output for a successful .hex upload can be seen in Figure 2.

```

Stefanos-MacBook-Pro:Ermi stefanos$ /Applications/Arduino.app/Contents/Java/hardware/tools/avr/bin/avrdude -C/Applications/Arduino.app/Contents/Java/hardware/tools/avr/etc/avrdude.conf -v -patmega32u4 -cavr109 -P/dev/cu.usbmodem143101 -b57600 -D -Uflash:w:/Users/stefanos/Downloads/SorTeS_GW07.hex:i

avrdude: Version 6.3-20171130
Copyright (c) 2000-2005 Brian Dean, http://www.bdmicro.com/
Copyright (c) 2007-2014 Joerg Wunsch

System wide configuration file is "/Applications/Arduino.app/Contents/Java/hardware/tools/avr/etc/avrdude.conf"
User configuration file is "/Users/stefanos/.avrduderc"
User configuration file does not exist or is not a regular file, skipping

Using Port : /dev/cu.usbmodem143101
Using Programmer : avr109
Overriding Baud Rate : 57600
AVR Part : ATmega32U4
Chip Erase delay : 9000 us
PAGEL : P07
BS2 : PA0
RESET disposition : dedicated
RETRY pulse : SCK
serial program mode : yes
parallel program mode : yes
Timeout : 200
StabDelay : 100
CmdexeDelay : 25
SyncLoops : 32
ByteDelay : 0
PollIndex : 3
PollValue : 0x53
Memory Detail

      Block Poll      Page
Memory Type Mode Delay Size  Indx Paged  Size   Size #Pages MinW  MaxW     ReadBack
-----
eeprom        65    20     4    0 no    1024     4      0  9000   9000 0x00 0x00
flash         65     6   128    0 yes   32768   128    256  4500   4500 0x00 0x00
lfuse          0     0     0    0 no      1     0      0  9000   9000 0x00 0x00
hfuse          0     0     0    0 no      1     0      0  9000   9000 0x00 0x00
efuse          0     0     0    0 no      1     0      0  9000   9000 0x00 0x00
lock           0     0     0    0 no      1     0      0  9000   9000 0x00 0x00
calibration    0     0     0    0 no      1     0      0    0     0 0x00 0x00
signature      0     0     0    0 no      3     0      0    0     0 0x00 0x00

Programmer Type : butterfly
Description      : Atmel AppNote AVR109 Boot Loader

Connecting to programmer: .
Found programmer: Id = "CATERIN"; type = S
    Software Version = 1.0; No Hardware Version given.
Programmer supports auto addr increment.
Programmer supports buffered memory access with buffersize=128 bytes.

Programmer supports the following devices:
    Device code: 0x44

avrdude: devcode selected: 0x44
avrdude: AVR device initialized and ready to accept instructions

Reading | ##### | 100% 0.00s

avrdude: Device signature = 0x1e9587 (probably m32u4)
avrdude: safemode: lfuse reads as FF
avrdude: safemode: hfuse reads as D8
avrdude: safemode: efuse reads as FE
avrdude: reading input file "/Users/stefanos/Downloads/SorTeS_GW07.hex"
avrdude: writing flash (12866 bytes):

Writing | ##### | 100% 1.06s

avrdude: 12866 bytes of flash written
avrdude: verifying flash memory against /Users/stefanos/Downloads/SorTeS_GW07.hex:
avrdude: load data flash data from input file /Users/stefanos/Downloads/SorTeS_GW07.hex:
avrdude: input file /Users/stefanos/Downloads/SorTeS_GW07.hex contains 12866 bytes
avrdude: reading on-chip flash data:

Reading | ##### | 100% 0.20s

avrdude: verifying ...
avrdude: 12866 bytes of flash verified

avrdude: safemode: lfuse reads as FF
avrdude: safemode: hfuse reads as D8
avrdude: safemode: efuse reads as FE
avrdude: safemode: Fuses OK (E:FE, H:D8, L:FF)

avrdude done. Thank you.

Stefanos-MacBook-Pro:Ermi stefanos$

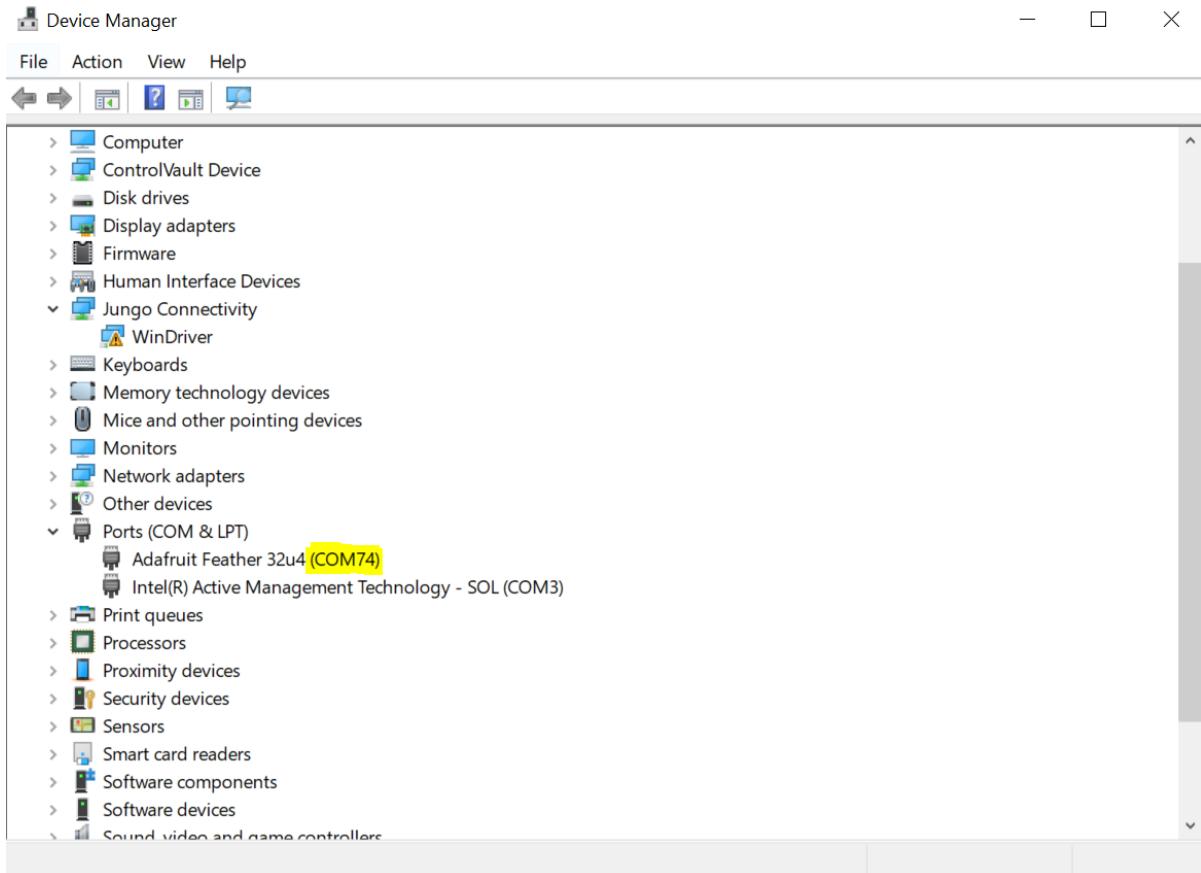
```

Figure 2: Terminal output for a succesful upload.

For Windows:

To upload image to the gateway:

- 1) You can use the Arduino sketch uploader. The binary is included in the package, alternatively you can download the command line binary from: <https://github.com/twinearthsoftware/ArduinoSketchUploader>
- 2) Unzip the package and copy the gateway image into the folder
- 3) Open a command line terminal and go to the folder where you have copied the Arduino sketch uploader
- 4) The board model to use is “Leonardo”
- 5) Connect your board and find the com port it is connected to, from device manager:



- 6) The command to upload the .hex file is:
`ArduinoSketchUploader.exe --file= SorTeS_GW07.hex --port=COM74 --model=Leonardo`

- 7) You will see the upload status after issuing the command:

```

Windows PowerShell
PS D:\ArduinoSketchUploader-3.2.0> ./ArduinoSketchUploader.exe --file=Sortes_GW07.hex --port=COM67 --model=Leonardo
2020-10-29 17:18:45.5697|INFO|ArduinoSketchUploader|Starting ArduinoSketchUploader...
2020-10-29 17:18:45.5956|INFO|ArduinoSketchUploader|Starting upload process for file 'Sortes_GW07.hex'.
2020-10-29 17:18:45.6844|INFO|ArduinoSketchUploader|Establishing memory block contents...
2020-10-29 17:18:45.7064|INFO|ArduinoSketchUploader|Opening serial port COM67 - baudrate 57600
2020-10-29 17:18:45.7103|INFO|ArduinoSketchUploader|Executing Post Open Behavior (ArduinoUploader.BootloaderProgrammers.ResetBehavior.ResetThrough1200BpsBehavior)...
2020-10-29 17:18:45.7103|INFO|ArduinoSketchUploader|Issuing forced 1200bps reset...
2020-10-29 17:18:45.7462|INFO|ArduinoSketchUploader|T+0 - Port not found
2020-10-29 17:18:45.8499|INFO|ArduinoSketchUploader|T+100 - Port not found
2020-10-29 17:18:45.9537|INFO|ArduinoSketchUploader|T+200 - Port not found
2020-10-29 17:18:46.0551|INFO|ArduinoSketchUploader|T+300 - Port not found
2020-10-29 17:18:46.1571|INFO|ArduinoSketchUploader|T+400 - Port not found
2020-10-29 17:18:46.2582|INFO|ArduinoSketchUploader|T+500 - Port not found
2020-10-29 17:18:46.3601|INFO|ArduinoSketchUploader|T+600 - Port found: COM66
2020-10-29 17:18:46.3601|INFO|ArduinoSketchUploader|Establishing sync...
2020-10-29 17:18:46.3671|INFO|ArduinoSketchUploader|Sync established.
2020-10-29 17:18:46.3671|INFO|ArduinoSketchUploader|Checking device signature...
2020-10-29 17:18:46.4000|INFO|ArduinoSketchUploader|Device signature checked.
2020-10-29 17:18:46.4000|INFO|ArduinoSketchUploader|Initializing device...
2020-10-29 17:18:46.4200|INFO|ArduinoSketchUploader|Software identifier: 'CATERIN'
2020-10-29 17:18:46.4330|INFO|ArduinoSketchUploader|Software Version: 1.0
2020-10-29 17:18:46.4459|INFO|ArduinoSketchUploader|Programmer type: S.
2020-10-29 17:18:46.4639|INFO|ArduinoSketchUploader|Block support - buffer size 128 bytes.
2020-10-29 17:18:46.4778|INFO|ArduinoSketchUploader|Supported devices: 68.
2020-10-29 17:18:46.4778|INFO|ArduinoSketchUploader|Selecting device type '68'...
2020-10-29 17:18:46.4948|INFO|ArduinoSketchUploader|Device initialized.
2020-10-29 17:18:46.4948|INFO|ArduinoSketchUploader|Enabling programming mode on the device...
2020-10-29 17:18:46.5097|INFO|ArduinoSketchUploader|Programming mode enabled.
2020-10-29 17:18:46.5097|INFO|ArduinoSketchUploader|Programming device...
2020-10-29 17:18:46.5097|INFO|ArduinoSketchUploader|Preparing to write 12866 bytes...
2020-10-29 17:18:46.5097|INFO|ArduinoSketchUploader|Flash page size: 128.
2020-10-29 17:18:46.5097|INFO|ArduinoSketchUploader|Upload progress: 0.0% ...
2020-10-29 17:18:46.5566|INFO|ArduinoSketchUploader|Upload progress: 0.5% ...
2020-10-29 17:18:46.5896|INFO|ArduinoSketchUploader|Upload progress: 1.0% ...
2020-10-29 17:18:46.6235|INFO|ArduinoSketchUploader|Upload progress: 1.5% ...
2020-10-29 17:18:46.6575|INFO|ArduinoSketchUploader|Upload progress: 2.0% ...
2020-10-29 17:18:46.6895|INFO|ArduinoSketchUploader|Upload progress: 2.5% ...
2020-10-29 17:18:46.7224|INFO|ArduinoSketchUploader|Upload progress: 3.0% ...
2020-10-29 17:18:46.7547|INFO|ArduinoSketchUploader|Upload progress: 3.5% ...
2020-10-29 17:18:46.7877|INFO|ArduinoSketchUploader|Upload progress: 4.0% ...
2020-10-29 17:18:46.8215|INFO|ArduinoSketchUploader|Upload progress: 4.5% ...

```

- 8) Wait until the upload is complete, and the firmware is flashed:

```

2020-10-29 17:18:52.7938|INFO|ArduinoSketchUploader|Upload progress: 97.8% ...
2020-10-29 17:18:52.8189|INFO|ArduinoSketchUploader|Upload progress: 98.3% ...
2020-10-29 17:18:52.8418|INFO|ArduinoSketchUploader|Upload progress: 98.7% ...
2020-10-29 17:18:52.8668|INFO|ArduinoSketchUploader|Upload progress: 99.2% ...
2020-10-29 17:18:52.8909|INFO|ArduinoSketchUploader|Upload progress: 99.7% ...
2020-10-29 17:18:52.9169|INFO|ArduinoSketchUploader|12866 bytes verified!
2020-10-29 17:18:52.9169|INFO|ArduinoSketchUploader|Verified program!
2020-10-29 17:18:52.9297|INFO|ArduinoSketchUploader|Leaving programming mode...
2020-10-29 17:18:52.9547|INFO|ArduinoSketchUploader|Left programming mode!
2020-10-29 17:18:52.9616|INFO|ArduinoSketchUploader|Closing COM66...
2020-10-29 17:18:52.9616|INFO|ArduinoSketchUploader|Waiting for virtual port COM66 to disappear...
2020-10-29 17:18:52.9616|INFO|ArduinoSketchUploader|T+0 - Port still present...
2020-10-29 17:18:53.0713|INFO|ArduinoSketchUploader|T+100 - Port still present...
2020-10-29 17:18:53.1755|INFO|ArduinoSketchUploader|T+200 - Port still present...
2020-10-29 17:18:53.2777|INFO|ArduinoSketchUploader|T+300 - Port still present...
2020-10-29 17:18:53.3804|INFO|ArduinoSketchUploader|T+400 - Port still present...
2020-10-29 17:18:53.4833|INFO|ArduinoSketchUploader|T+500 - Port still present...
2020-10-29 17:18:53.5845|INFO|ArduinoSketchUploader|T+600 - Port disappeared: COM66!
2020-10-29 17:18:53.5845|INFO|ArduinoSketchUploader|All done, shutting down!
PS D:\ArduinoSketchUploader-3.2.0>

```

Thursday, October 29, 2020

Thursday, October 29, 2020