Installing the Microcontroller board software on your personal computer

Instructions for windows ONLY. If you are running OSX, you will need to run windows in bootcamp or a virtual machine.

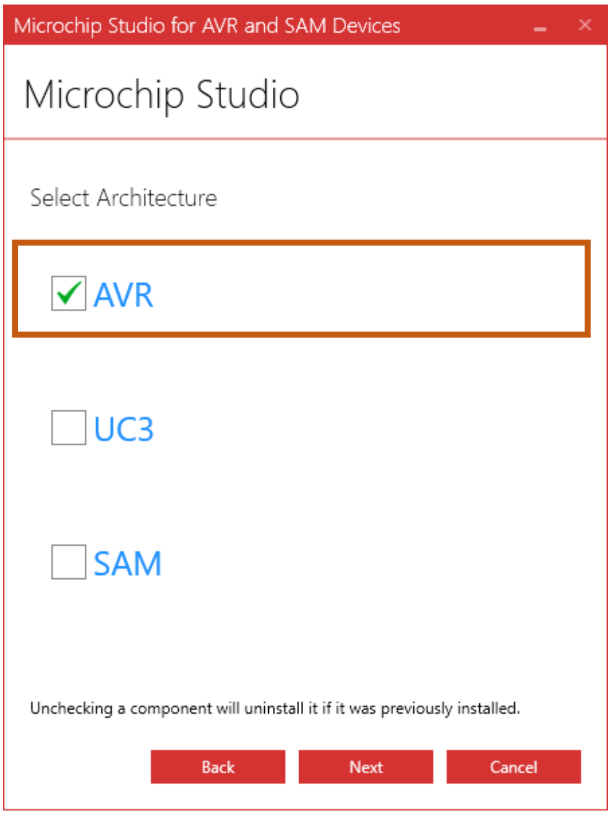
1. Download Atmel Studio 7/Microchip Studio

Download the software from this webpage:

https://www.microchip.com/en-us/development-tools-tools-and-software/microchip-studio-for-avr-and-sam-devices

2. Install Atmel Studio 7/Microchip Studio

Run the Atmel Studio 7/Microchip Studio installer and follow the instructions.



Microchip Studio for AVR and SAM Devices

Microchip Studio

Select Architecture

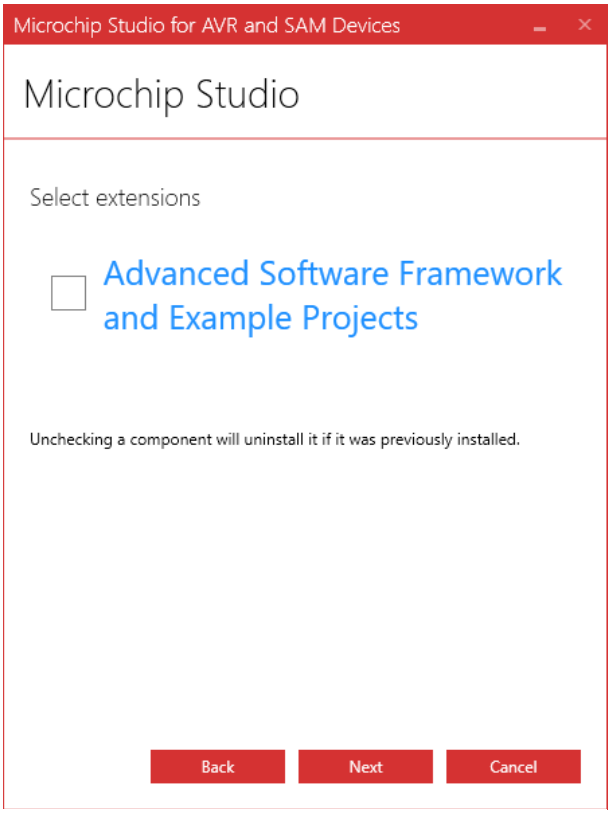
☑ AVR

□ UC3

□ SAM

Unchecking a component will uninstall it if it was previously installed.

MAKE SURE YOU CHECK "AVR"!



Microchip Studio for AVR and SAM Devices

Microchip Studio

Select extensions

□ Advanced Software Framework and Example Projects

Unchecking a component will uninstall it if it was previously installed.

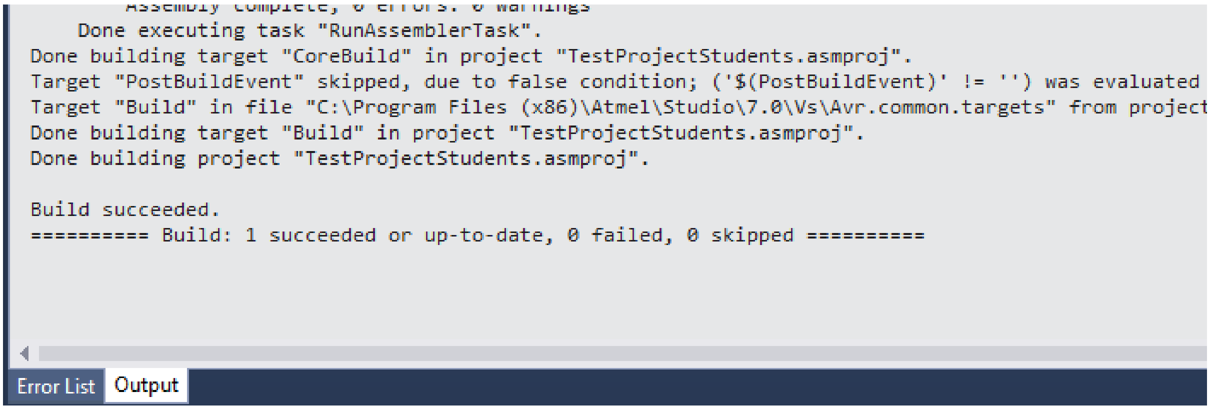
You can uncheck Advaced Software Framework to save disk space

3. Follow the instructions in ucontroller_getstarted.pdf to setup your solution and projects

My program does not upload. What now?

Does your code compile correctly?

Build your project or full solution. Check that there are no errors in the code and the build result output says “Build succeeded” for your current project.



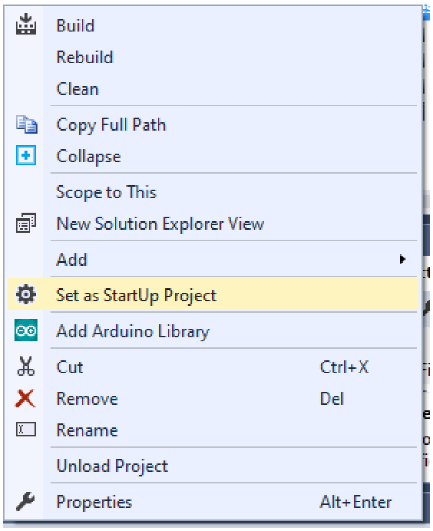
```
        Assembly complete, 0 errors. 0 warnings
    Done executing task "RunAssemblerTask".
Done building target "CoreBuild" in project "TestProjectStudents.asmproj".
Target "PostBuildEvent" skipped, due to false condition; ('$(PostBuildEvent)' != '') was evaluated
Target "Build" in file "C:\Program Files (x86)\Atmel\Studio\7.0\Vs\Avr.common.targets" from project
Done building target "Build" in project "TestProjectStudents.asmproj".
Done building project "TestProjectStudents.asmproj".

Build succeeded.
========== Build: 1 succeeded or up-to-date, 0 failed, 0 skipped ==========
```

Is the correct project selected as start-up project?

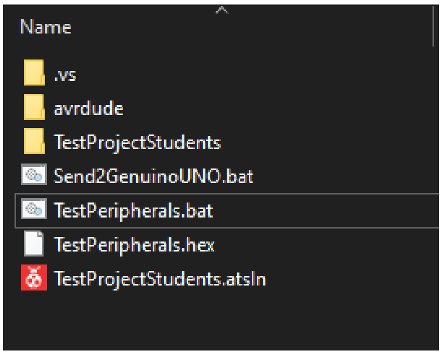
Make sure the project you want to upload is selected as start-up project. The name of the project should be in **Bold.**

Set the project as start-up project by right clicking on the project and choosing “Set as StartUp Project”



Are your external tools setup correctly?

Check if you did copy the contents of the “Portables.zip” from canvas to your solution directory. It should look something like this:



Name

.vs

avrdude

TestProjectStudents

Send2GenuinoUNO.bat

TestPeripherals.bat

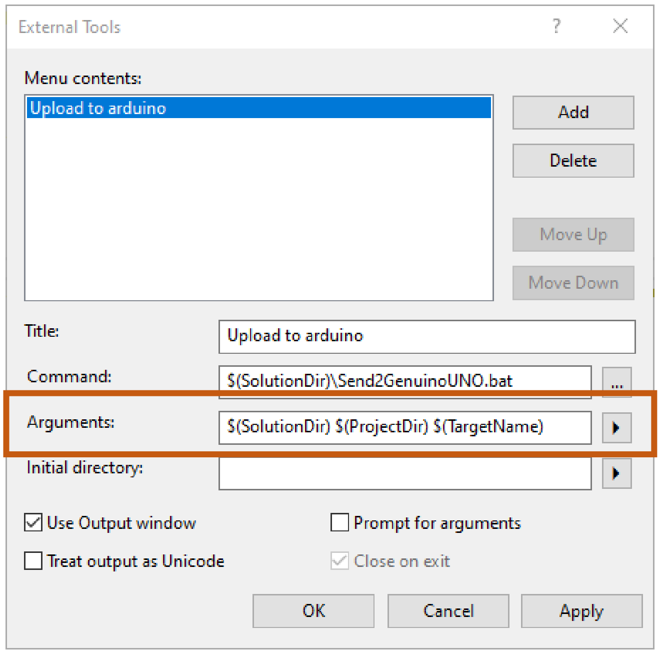
TestPeripherals.hex

TestProjectStudents.atsln

Are you missing spaces between the arguments in your external tools?

The arguments box should contain: **$(SolutionDir) $(ProjectDir) $(TargetName)**

There are whitespaces between the arguments! Make sure no typo is present and the capitalization matches exactly!



Menu contents: Upload to arduino

Title: Upload to arduino

Command: $(SolutionDir)\Send2GenuinoUNO.bat

Arguments: $(SolutionDir) $(ProjectDir) $(TargetName)

Initial directory:

☑ Use Output window

□ Prompt for arguments

□ Treat output as Unicode

☑ Close on exit

Valid output of the upload tool looks like this:

```
---------------------------------------------------------------------------
---------------------------------------------------------------------------
Sensors and Microsystem Electronics
Practical assignment: microcontroller design
---------------------------------------------------------------------------
---------------------------------------------------------------------------

This script uploads a program to the microcontroller board.
Make sure the microcontroller board is connected to this computer !!!
---------------------------------------------------------------------------
Solution directory: "F:\SME\TestProjectStudents\\"
Project directory:  "F:\SME\TestProjectStudents\TestProjectStudents\\"
Target name:        "TestProjectStudents.hex"
COM port number:    COM4


avrdude: AVR device initialized and ready to accept instructions

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

avrdude: Device signature = 0x1e950f
avrdude: NOTE: FLASH memory has been specified, an erase cycle will be performed
         To disable this feature, specify the -D option.
avrdude: erasing chip
avrdude: reading input file "F:\SME\TestProjectStudents\TestProjectStudents\\Debug\TestProjectStudents.hex"
avrdude: writing flash (1254 bytes):

Writing | ################################################## | 100% 0.20s

avrdude: 1254 bytes of flash written
avrdude: verifying flash memory against F:\SME\TestProjectStudents\TestProjectStudents\\Debug\TestProjectStudents.hex:
avrdude: load data flash data from input file F:\SME\TestProjectStudents\TestProjectStudents\\Debug\TestProjectStudents.hex:
avrdude: input file F:\SME\TestProjectStudents\TestProjectStudents\\Debug\TestProjectStudents.hex contains 1254 bytes
avrdude: reading on-chip flash data:

Reading | ################################################## | 100% 0.16s

avrdude: verifying ...
avrdude: 1254 bytes of flash verified

avrdude: safemode: Fuses OK

avrdude done.  Thank you.

Press any key to continue . . .
```

No Instance(s) Available.

avrdude: ser_open(): can't open device "-b": The system cannot find the file specified.

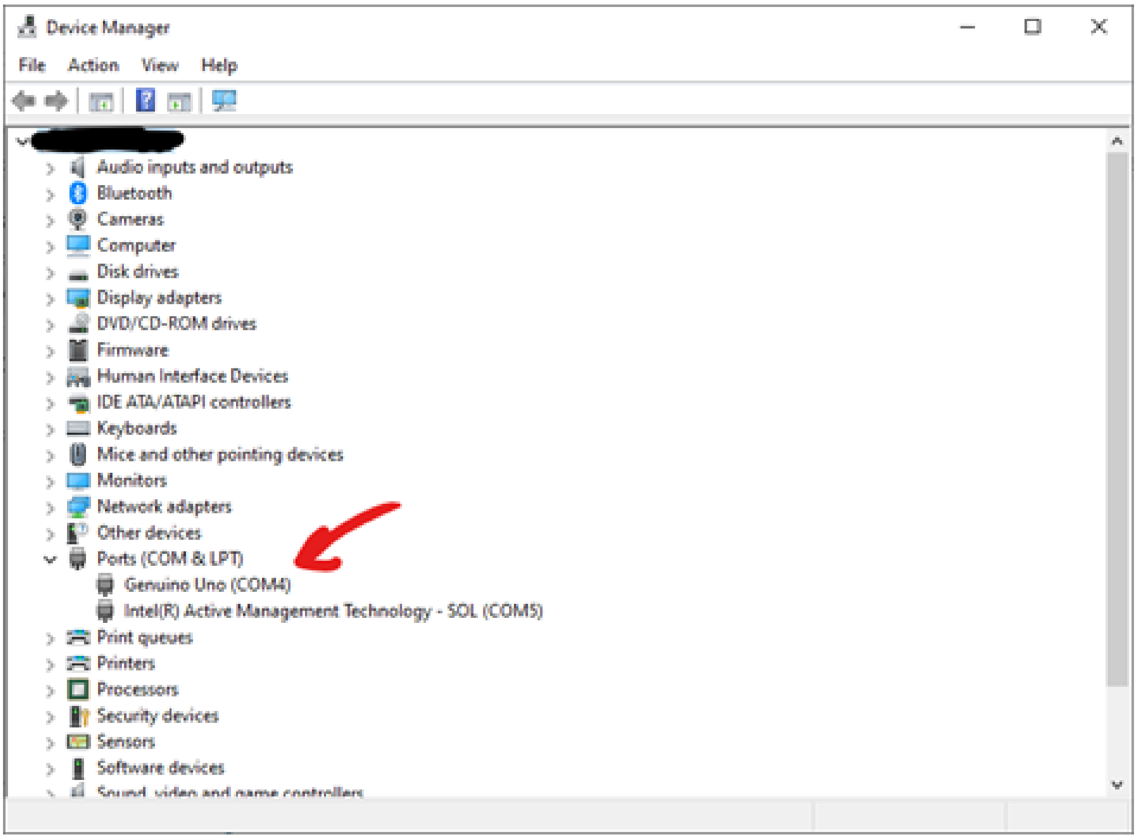
This problem can have multiple causes:

- Make sure your Arduino is connected to the PC with the USB cable
- Your computer does not recognize the Arduino
- Missing drivers cause the upload script to not find the Arduino.

1. Check that the Arduino is recognized correctly

Open *"Device manager"* by right clicking on the start menu.
[French: *"Gestionnaire de périphériques"*]
[Dutch: *"Apparaatbeheer"*]

Scroll down to see if there is <u>at least one</u> entry in the section *"Ports (COM & LPT)"*. If there are multiple, unplug and replug the USB cable to see which entry disappears.

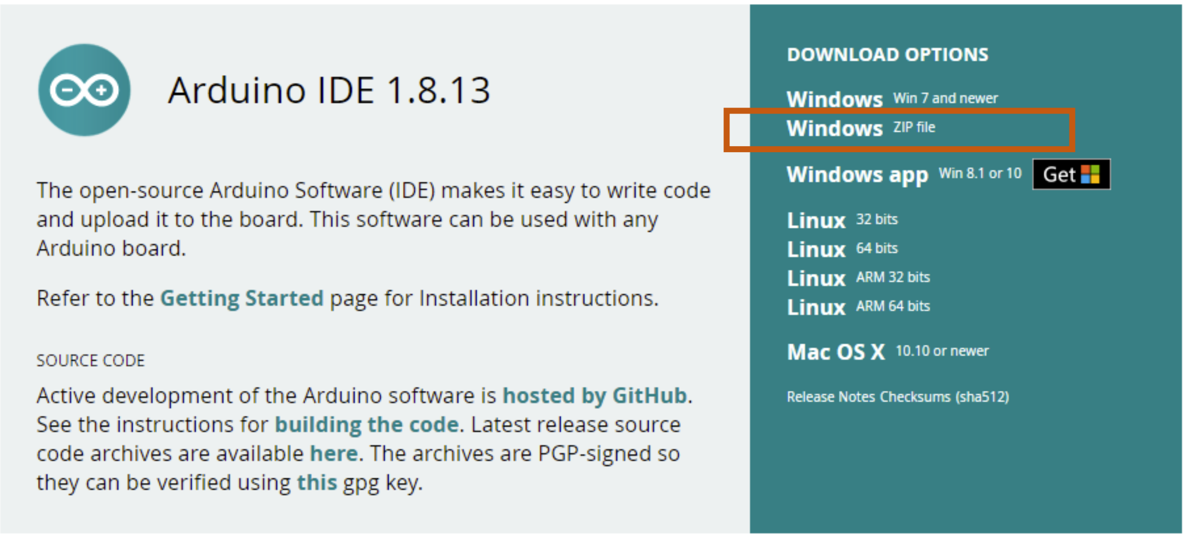


If it shows anything other than *"Genuino UNO"* or *"USB Serial Port"* the script will not recognize it. To fix this follow the steps below

1. Download the Arduino drivers

*Download Arduino IDE as ZIP **or** download drivers from canvas.*

Arduino IDE as zip: https://www.arduino.cc/en/software



Arduino IDE 1.8.13

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the **Getting Started** page for Installation instructions.

SOURCE CODE

Active development of the Arduino software is **hosted by GitHub**. See the instructions for **building the code**. Latest release source code archives are available **here**. The archives are PGP-signed so they can be verified using **this** gpg key.

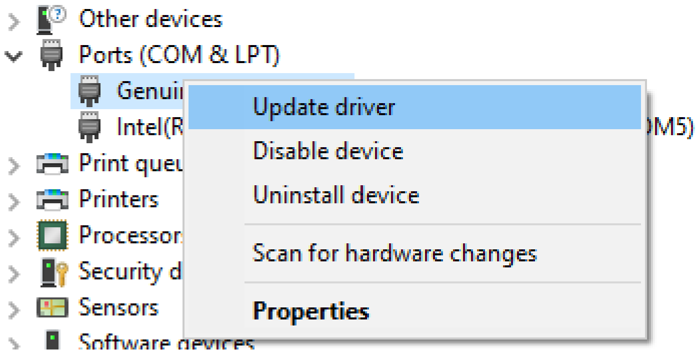
Drivers: See zip file on canvas in *"Software"*

2. Extract the folder in a known location.

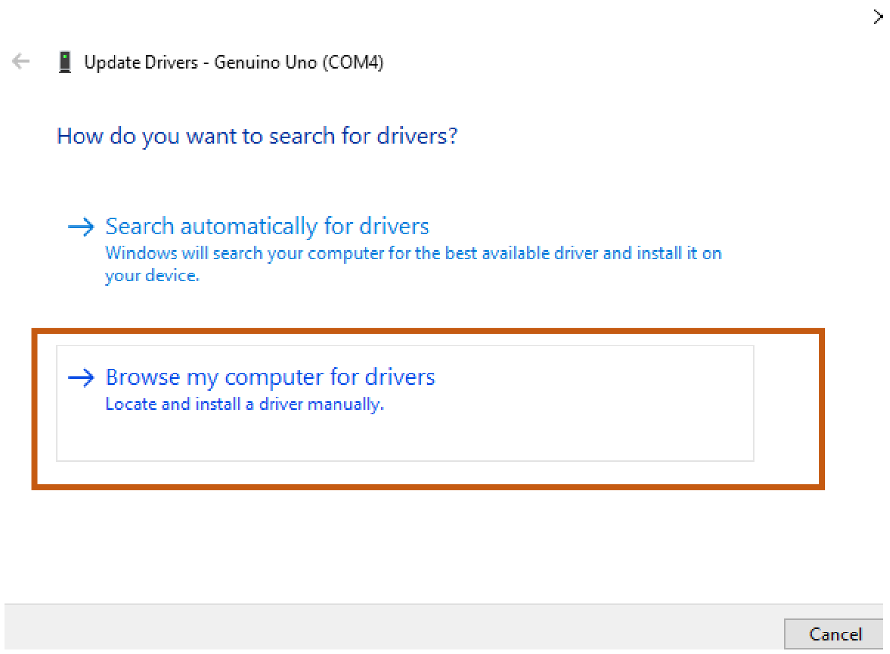
E.g. your downloads folder.

3. In device manager right click on the serial port entry, and choose "Update driver"

(Or whatever translation is available in your language)



4. Choose the second option: “Browse my computer for drivers



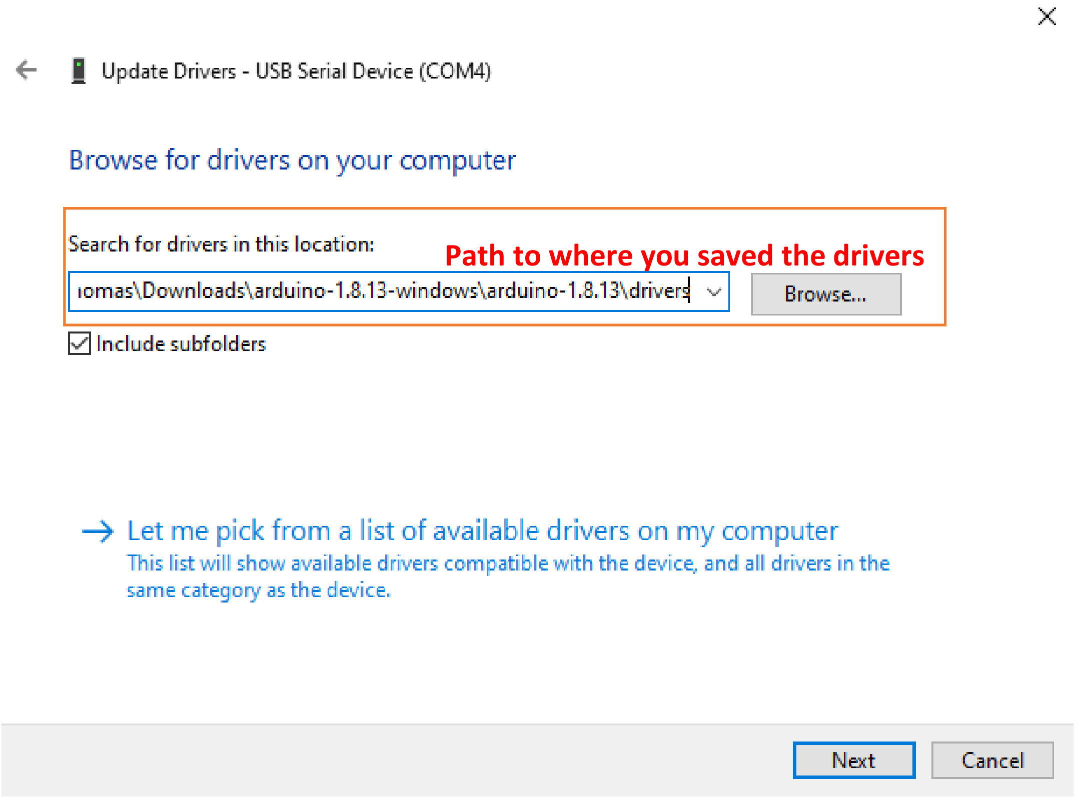
Update Drivers - Genuino Uno (COM4)

How do you want to search for drivers?

→ Search automatically for drivers
Windows will search your computer for the best available driver and install it on your device.

→ Browse my computer for drivers
Locate and install a driver manually.

5. Navigate to the location where you extracted the Arduino ZIP or the Driver ZIP. **In case of the Arduino ZIP download, navigate to the “Drivers” subfolder.**



Update Drivers - USB Serial Device (COM4)

Browse for drivers on your computer

Search for drivers in this location:

ıomas\Downloads\arduino-1.8.13-windows\arduino-1.8.13\drivers

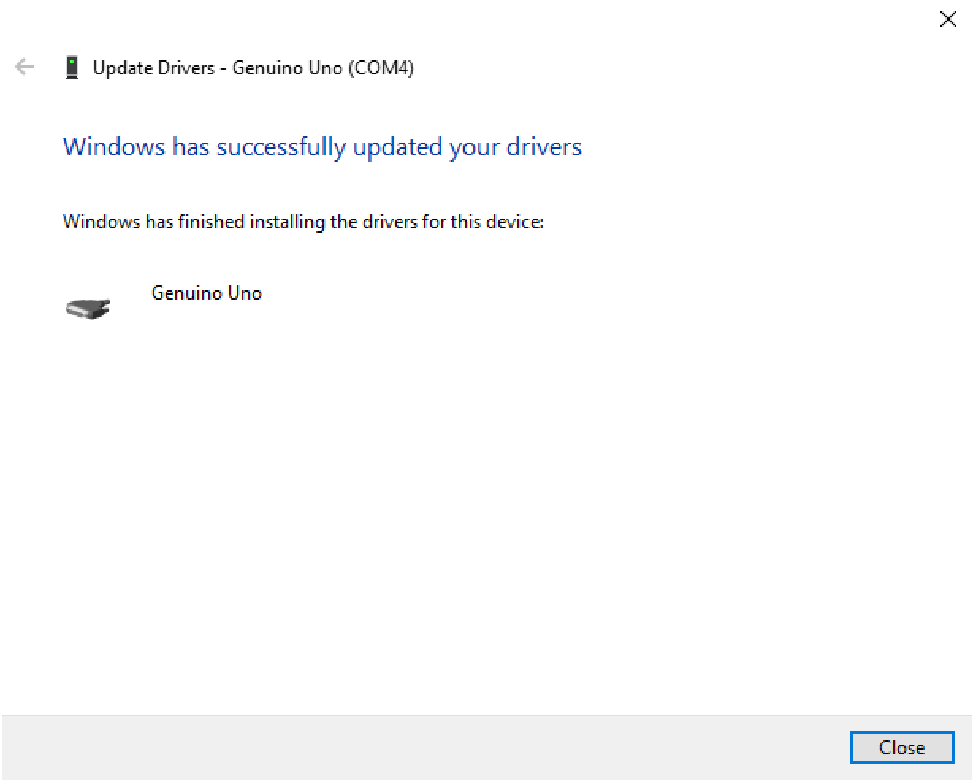
Path to where you saved the drivers

☑ Include subfolders

→ Let me pick from a list of available drivers on my computer
This list will show available drivers compatible with the device, and all drivers in the same category as the device.

Click next

6. Normally it will finish with this screen:



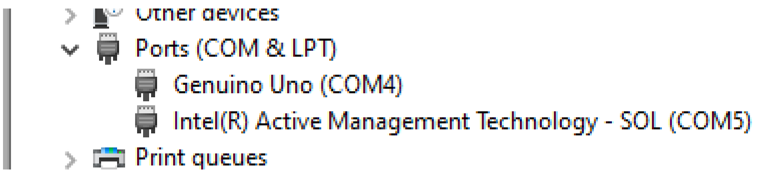
Update Drivers - Genuino Uno (COM4)

Windows has successfully updated your drivers

Windows has finished installing the drivers for this device:

Genuino Uno

Check *"Device manager"* again, it should now show up as *"Genuino Uno (COMx)"*



Other devices

Ports (COM & LPT)

Genuino Uno (COM4)

Intel(R) Active Management Technology - SOL (COM5)

Print queues

7. Profit!

Now the upload script should recognize the Arduino.