

# Setup External programmer in Atmel Studio

Last Edited: Guangxin Wang 01/06/2020

This guide shows you how to add an external programmer in Atmel Studio 7.0. Once setup the external programmer, you can flash the AVR board without switching to “Universal\_GUI.exe”, which provides a seamless workflow that making debug and troubleshooting a bit faster.

## 0. Download avrdude

On the school computer, avrdude is installed at

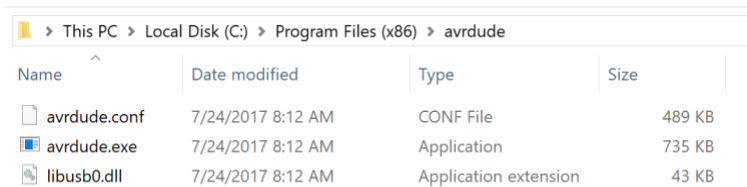
```
V:\avrdude\avrdude.exe
```

For your personal Windows PC, you can download avrdude here:

<http://web.engr.oregonstate.edu/~jinyo/ece375/sw/avrdude.zip>

Unzip the file and save to your preferred directory, e.g.

```
C:\Program Files (x86)\avrdude\avrdude.exe
```



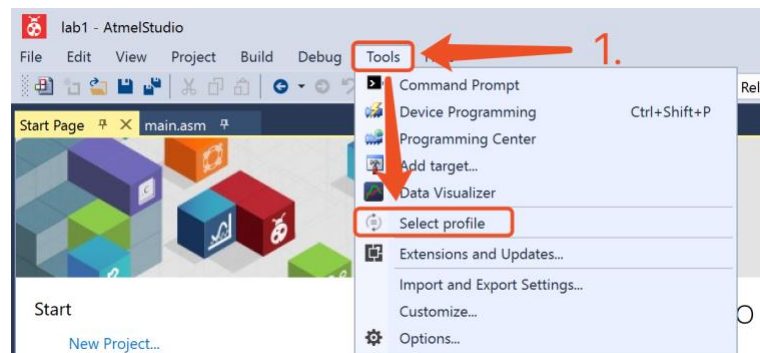
A screenshot of a Windows File Explorer window showing the contents of the 'avrdude' directory. The address bar shows the path: 'This PC > Local Disk (C:) > Program Files (x86) > avrdude'. The main area contains a table with columns for Name, Date modified, Type, and Size.

Name	Date modified	Type	Size
avrdude.conf	7/24/2017 8:12 AM	CONF File	489 KB
avrdude.exe	7/24/2017 8:12 AM	Application	735 KB
libusb0.dll	7/24/2017 8:12 AM	Application extension	43 KB

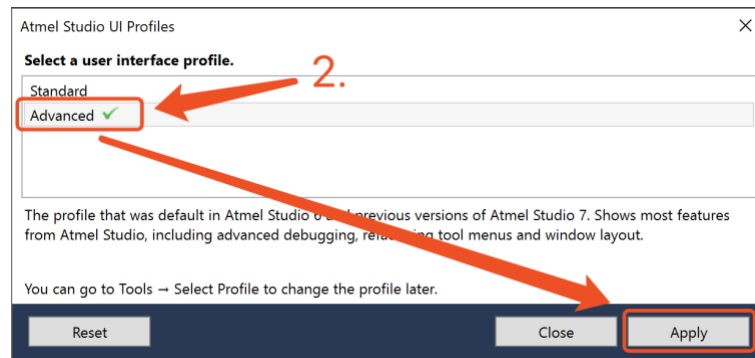
## 1. Enable “Advanced Mode”

In order to setup an External programmer, Atmel Studio needs to be in 'Advanced' profile. This can be found under the Tools menu.

Go to > Tools > Select Profile.

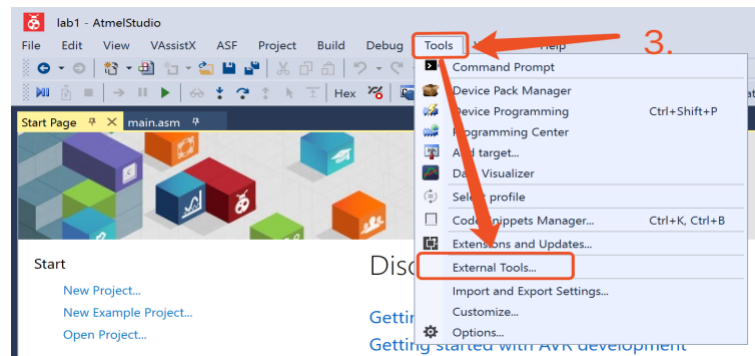


Select “Advanced” and click “Apply”.

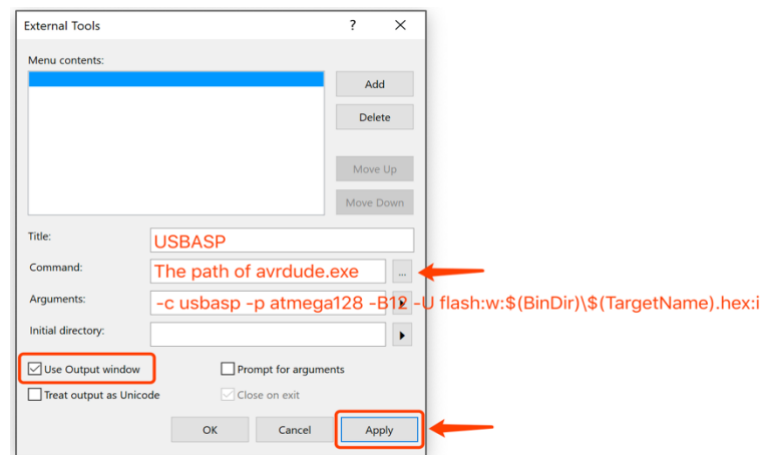


## 2. Add “External Tools”

Go to > Tools > External Tools.



Add new external tool



Title:

USBASP (or the name of your choice)

Commands:

C:\Program Files (x86)\avrdude\avrdude.exe (or the path of avrdude.exe)

Arguments:

-c usbasp -p atmega128 -B12 -U flash:w:\$(BinDir)\\$(TargetName).hex:i

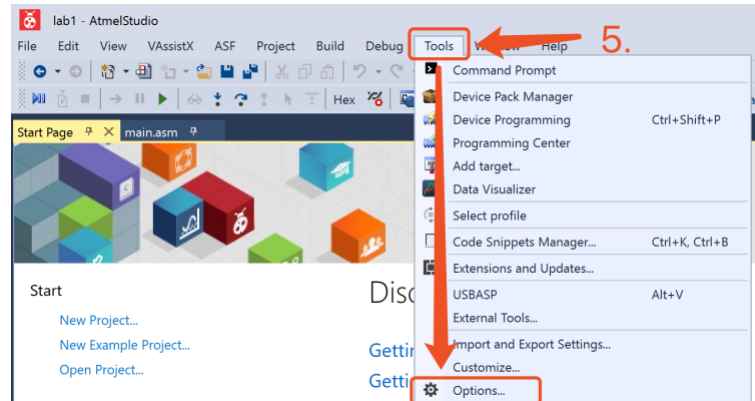
Check  “Use Output window”, Uncheck  “Treat output as Unicode” and  “Prompt for arguments”.

Then, click “Apply” to save the setting.

### 3. Setup keyboard shortcut (Optional)

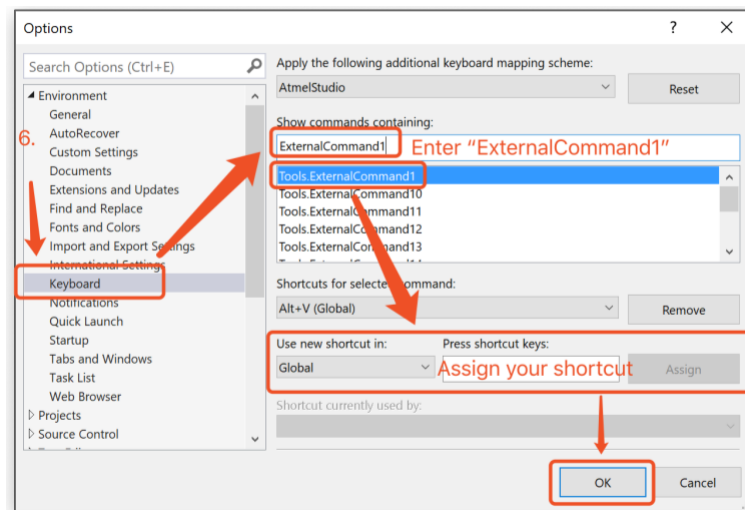
**This section is optional. You can skip it if you feel more clicky using the mice or touchpad.**

Go to > Tools > Options



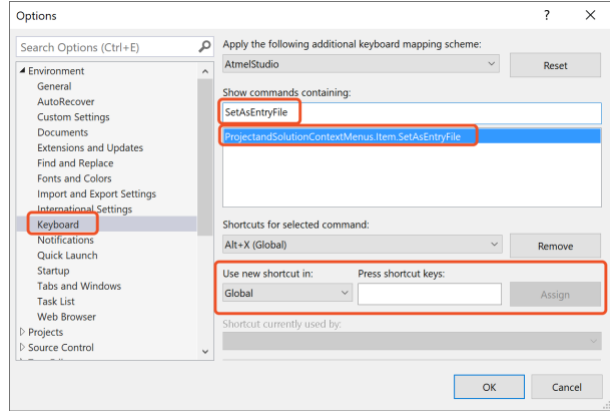
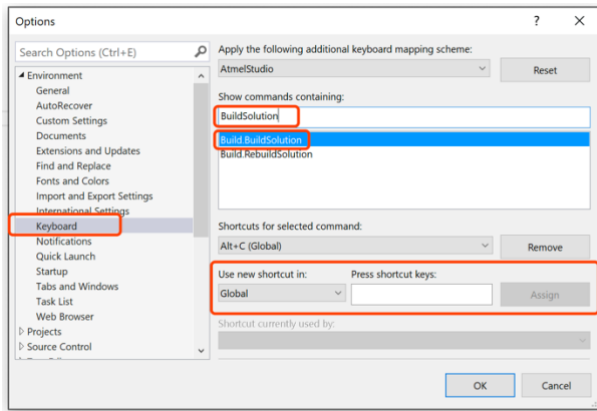
Select “Keyboard”, enter “ExternalCommand1” and select “Tools.ExternalCommand1”.

Enter your preferred shortcut keys and click “Assign”. Click “Ok” to save the setting.



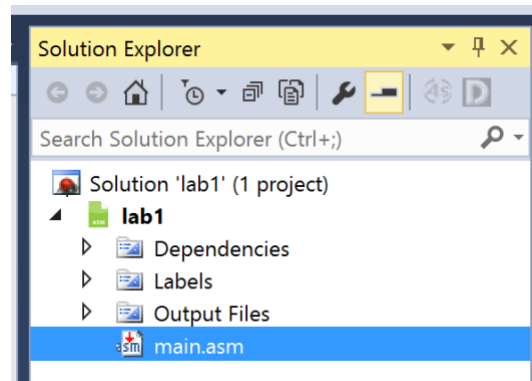
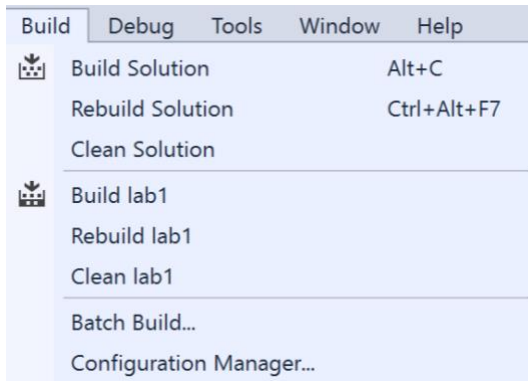
You can also assign shortcuts for other frequently used command like “Set as Entry File” or “Build Solution”, e.g. my choices of shortcut are:

Set as Entry File:	Alt+X	(Hint: X as check mark)
Build Solution:	Alt+C	(Hint: C as compile)
ExternalCommand1:	Alt+V	(Hint: well, it's next to X and C...)

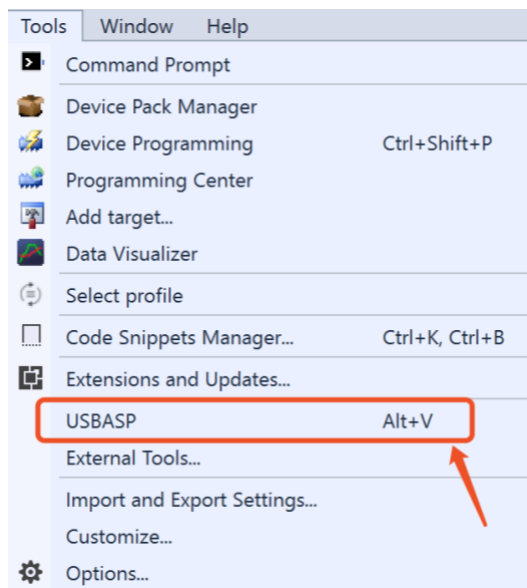


#### 4. Flash hex file with external programmer

First, make sure to build your project. In the Solution Explorer, as long as you are in the correct project, it does not matter which folder or file is highlighted.



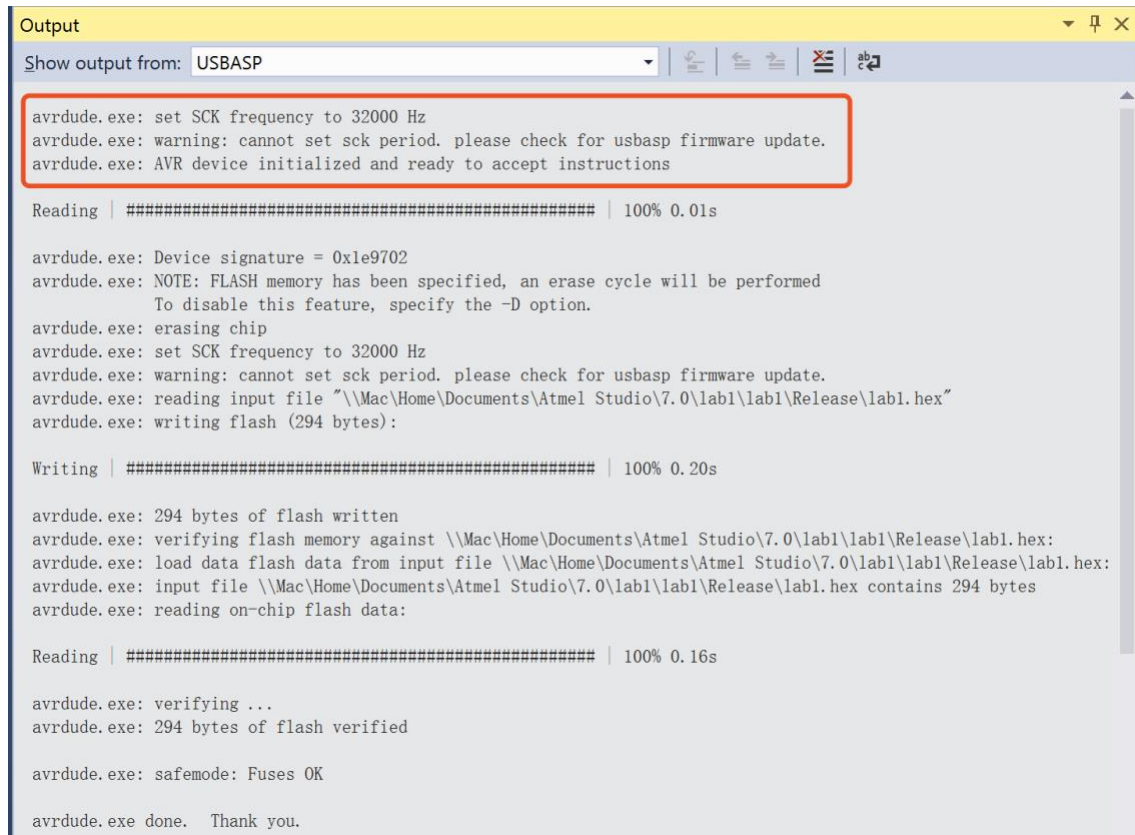
Go to > Tool > USBASP, or use the shortcut of your choice.



## 5. DONE!

If you see the following message, you have the hex file flashed on the AVR board.

You may see a warning in the output window, but it can be ignored.



```
Output
Show output from: USBASP

avrdude.exe: set SCK frequency to 32000 Hz
avrdude.exe: warning: cannot set sck period. please check for usbasp firmware update.
avrdude.exe: AVR device initialized and ready to accept instructions

Reading | ##### | 100% 0.01s

avrdude.exe: Device signature = 0x1e9702
avrdude.exe: NOTE: FLASH memory has been specified, an erase cycle will be performed
          To disable this feature, specify the -D option.
avrdude.exe: erasing chip
avrdude.exe: set SCK frequency to 32000 Hz
avrdude.exe: warning: cannot set sck period. please check for usbasp firmware update.
avrdude.exe: reading input file "\\Mac\Home\Documents\Atmel Studio\7.0\lab1\lab1\Release\lab1.hex"
avrdude.exe: writing flash (294 bytes):

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

avrdude.exe: 294 bytes of flash written
avrdude.exe: verifying flash memory against \\Mac\Home\Documents\Atmel Studio\7.0\lab1\lab1\Release\lab1.hex:
avrdude.exe: load data flash data from input file \\Mac\Home\Documents\Atmel Studio\7.0\lab1\lab1\Release\lab1.hex:
avrdude.exe: input file \\Mac\Home\Documents\Atmel Studio\7.0\lab1\lab1\Release\lab1.hex contains 294 bytes
avrdude.exe: reading on-chip flash data:

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

avrdude.exe: verifying ...
avrdude.exe: 294 bytes of flash verified

avrdude.exe: safemode: Fuses OK

avrdude.exe done. Thank you.
```

### Acknowledgment:

This is a revised version of previous guide “Adding an External programmer in Atmel Studio”.

You can watch the YouTube video: [https://www.youtube.com/watch?v=5zHI\\_Gy9ziw](https://www.youtube.com/watch?v=5zHI_Gy9ziw)