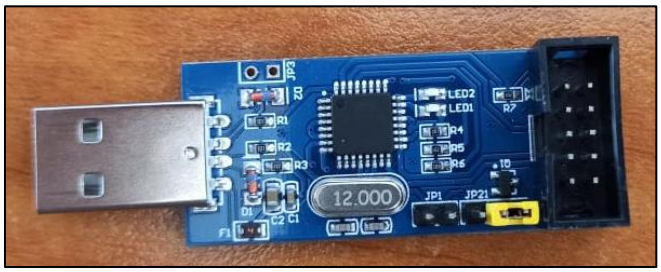
Setting Up AVR In System Programmer (ISP)

Contents

1. Introduction

This tutorial has been made to easily get the AVR ISP up and running on any Windows based PC for the Atmega16/Atmega16A. The process has been tested specifically on Windows 7 and Windows 10. The ISP used is based on the Atmega8A and has 10 pins, a snapshot of which is attached:

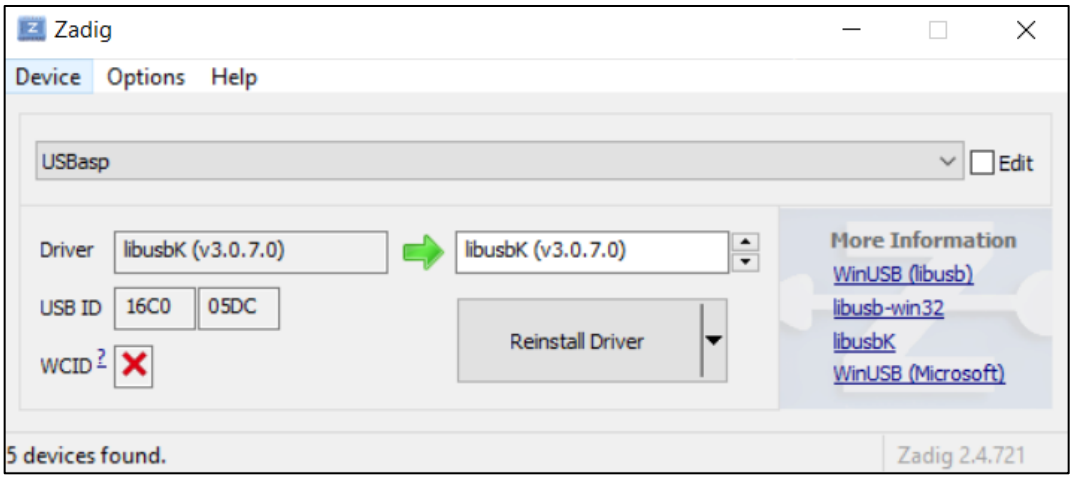


2. Setting Up the ISP

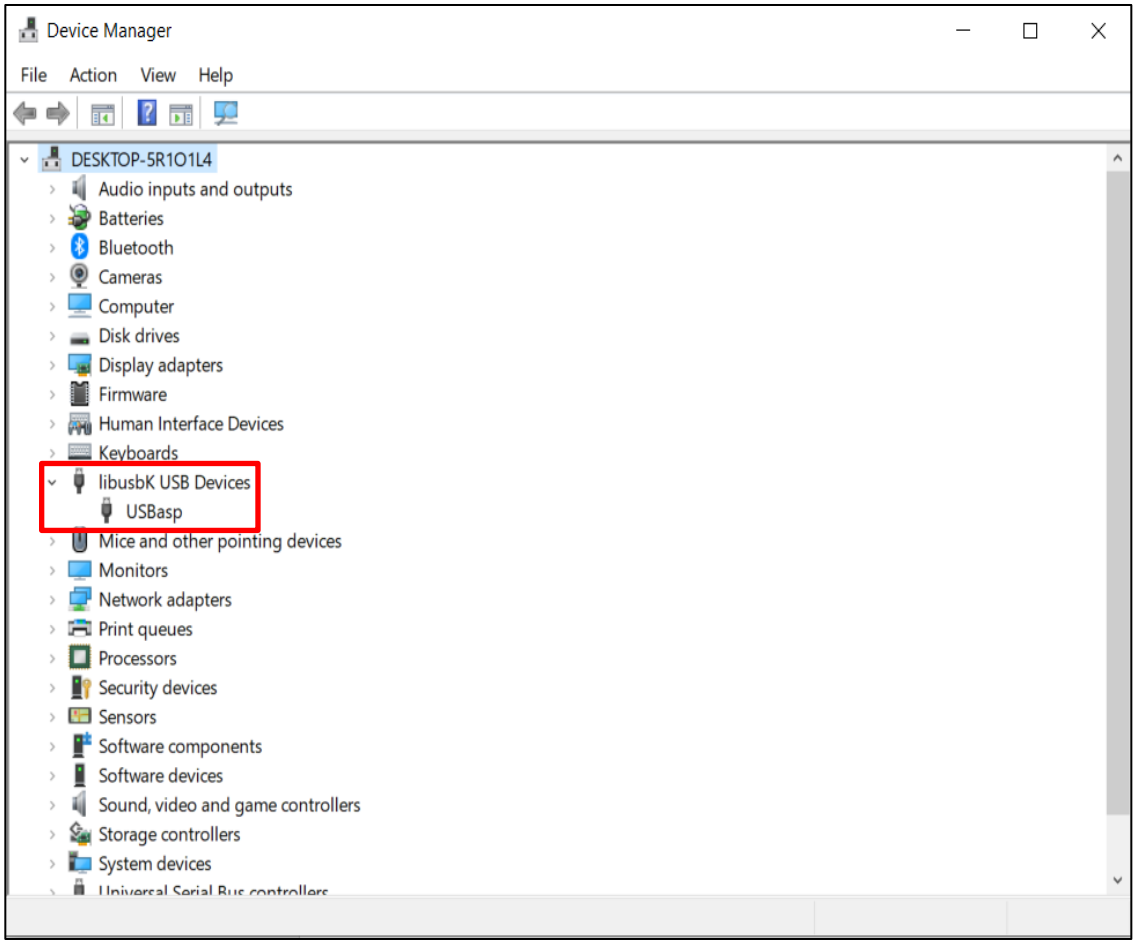
Follow the given steps to get started with your ISP:

i. Download and Use Zadig:

The first software we need is a little tool called Zadig, which can be found here (be sure to get the latest version). This is a simple executable utility and does not require an installation (you are free to delete it once the process is complete). Insert the ISP into any working USB port of your computer and open the program. Use the drop-down menus to match your settings to the snapshot below (you will of course see '***Install Driver***' instead of '***Reinstall Driver***').



Click '***Install Driver***' and wait for it to complete. Afterwards, open up device manager (press ⊞+R, type '***devmgmt.msc***' and press enter) and verify the presence of the items highlighted below:

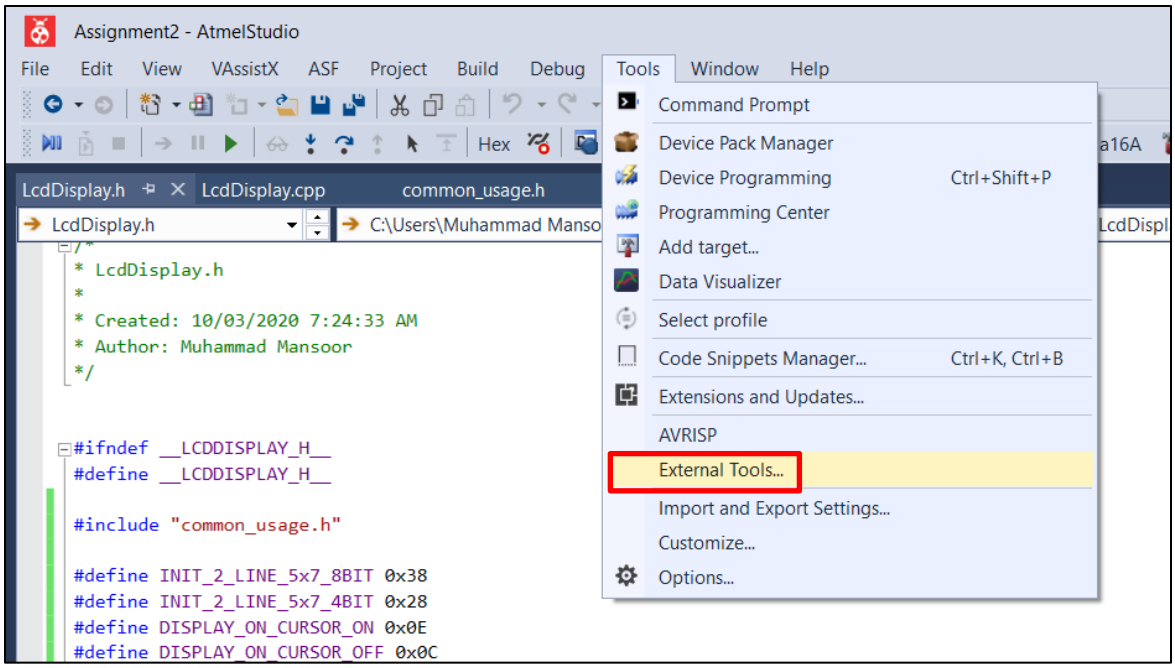


ii. Download and Install WINAVR

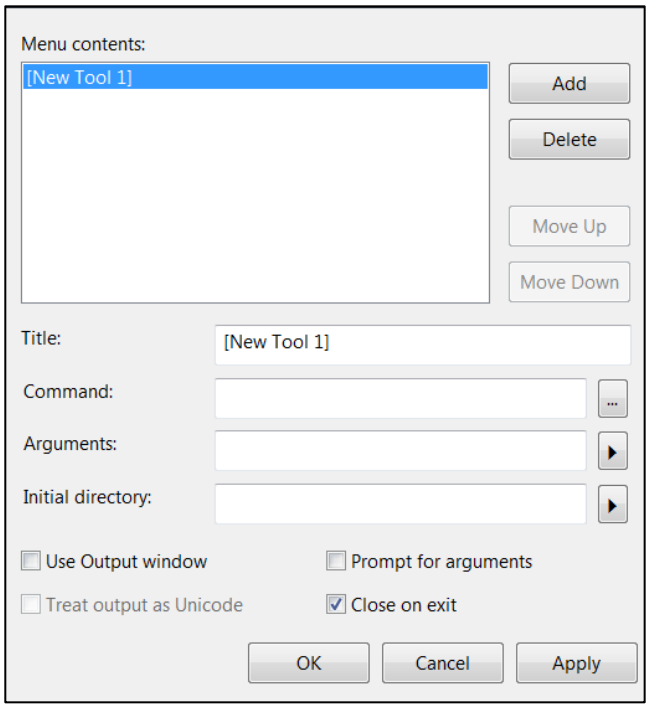
Next download WINAVR from here. This program requires installation. It is recommended that you use the default installation settings, i.e. keep pressing '***Next***' and then press '***Install***' (not doing so may cause difficulties in later steps). The program will install itself in the directory '***C:\WinAVR-20100110***' or similar depending on the exact version you get.

iii. Add the ISP to Atmel Studio

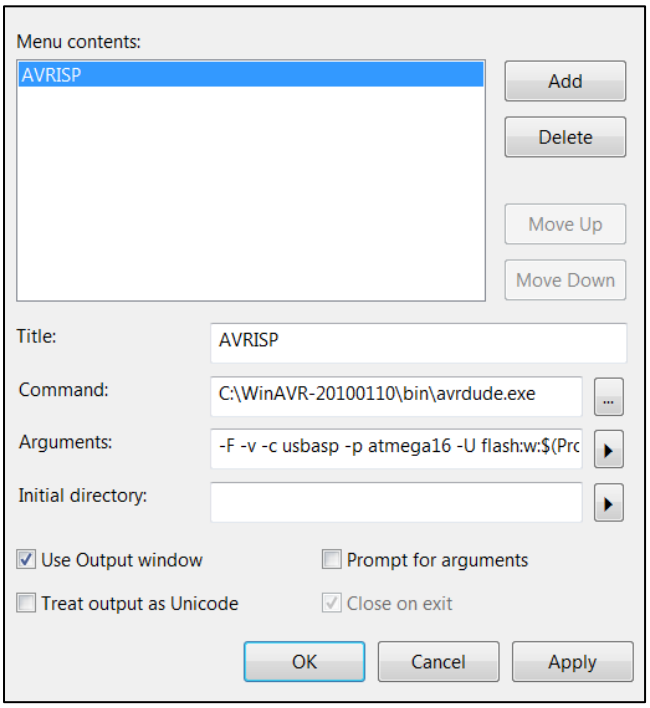
Now launch Atmel Studio. In the menu bar, in the tools-menu, click '***External Tools***' (you will not see the '***AVRISP***' above '***External Tools***' as that would defeat the purpose of this tutorial).



You should see this:



Now we must turn it into this:



You may simply copy and paste the following into the relevant field:

Title: AVRISP

Command: C:\WinAVR-20100110\bin\avrdude.exe

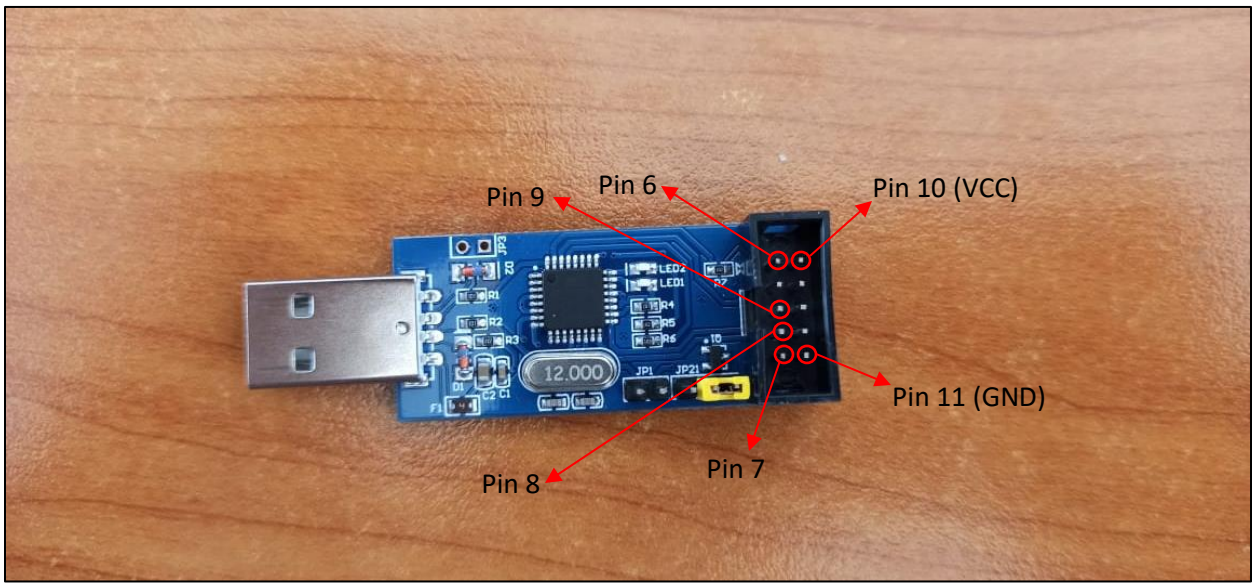
Arguments: -F -v -c usbasp -p atmega16 -U flash:w:$(ProjectDir)Debug\$(TargetName).hex:i

Note that the '***Command***' may be different for you depending on your choice of installation in step ii as well as the version of WINAVR you get. Just find the directory where WINAVR is installed and locate '***avrdude.exe***' in the '***bin***' directory. Copy the path into the '***Command***' text box. Also be sure to match the check boxes. Click '***Apply***' or '***OK***' when finished.

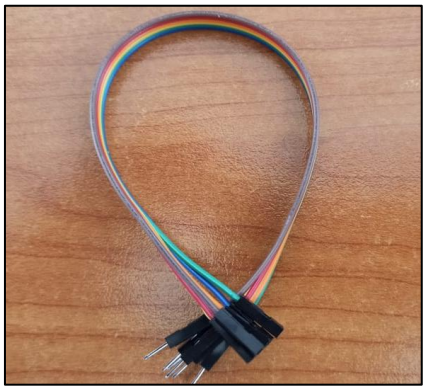
3. Using the ISP

To use the ISP, make sure that your AVR microcontroller is **unpowered**. Power is provided by the ISP itself, and in fact the ISP can be used to power your circuit once you are done programming it.

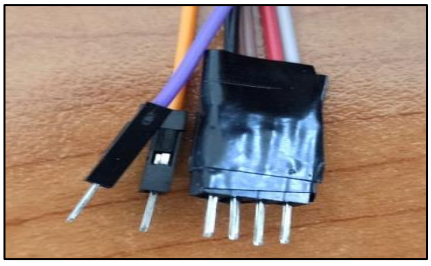
Now, without diving into any of the technicalities, we present the pins of the ISP along with their destination on the AVR being programmed:



The pins on which no connection is indicated are to remain unused. Instead of the bus that comes with the ISP, it is recommended to use male-to-female Dupont connectors (jumpers) to make the connections:

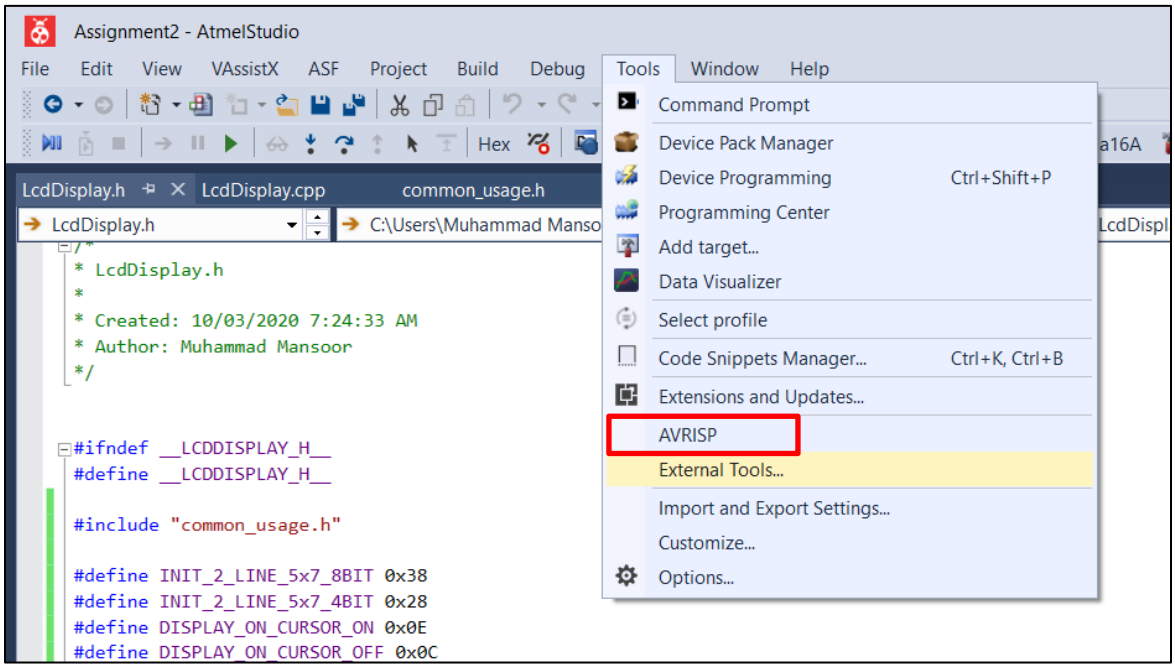


You will notice that the destination pins are all adjacent, so you can join them using tape for convenience:

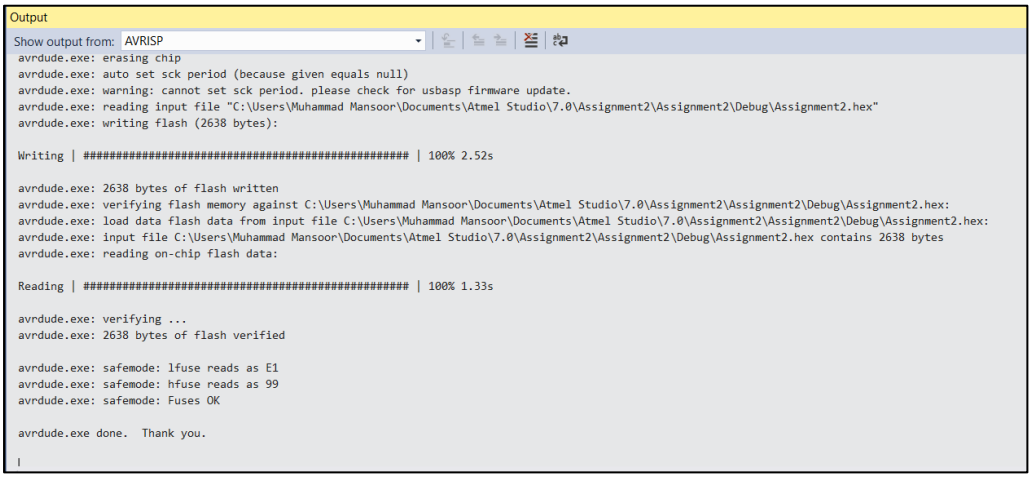


Notice that VCC and GND have been kept independent of the programming pins so they can be used to power circuits.

Finally, once the connections are made, build your program in Atmel Studio and click on '***AVRISP***' in the '***Tools***' menu to program your device:



You should see something like this in the Output window at the bottom:



You are now ready to program at will!