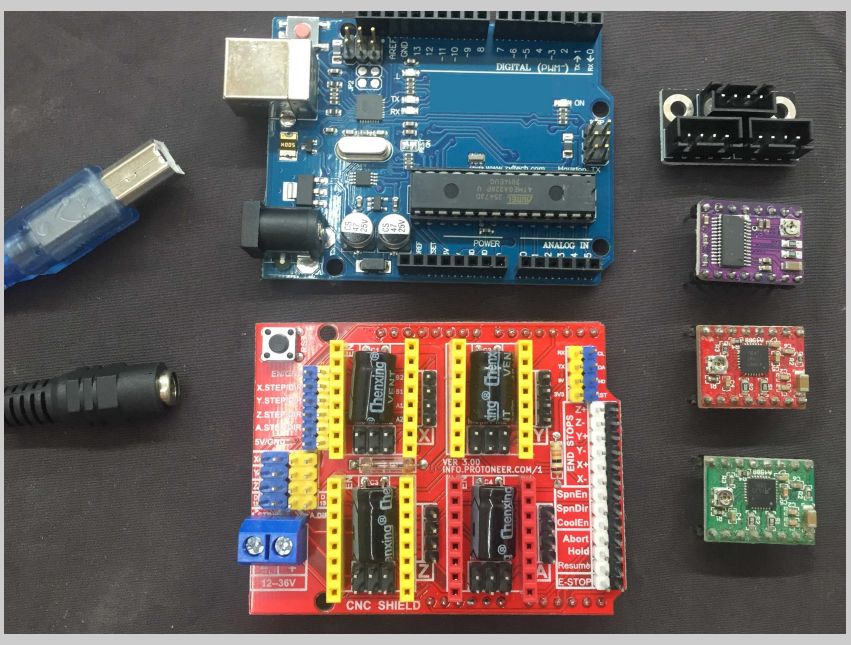
GGFLEX Electronics Assembly

DDCut Compatibility – v2.1

(rev 4.15.21 by hattrick)

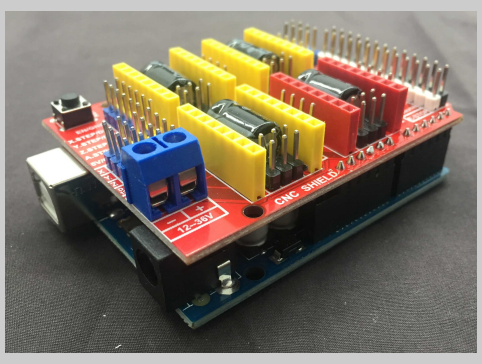


1. Before assembly, visually check over the Arduino R3, CNC Shield, and Stepper Drivers for any signs of short solder contacts, burnt out or damaged components, bent or broken pins, etc. (If you purchased from a reputable vendor, their Quality Control should have screened out most potential issues, but visual checks early on are still important and recommended as a simple solder failure or short could burn out more expensive components down the road!)

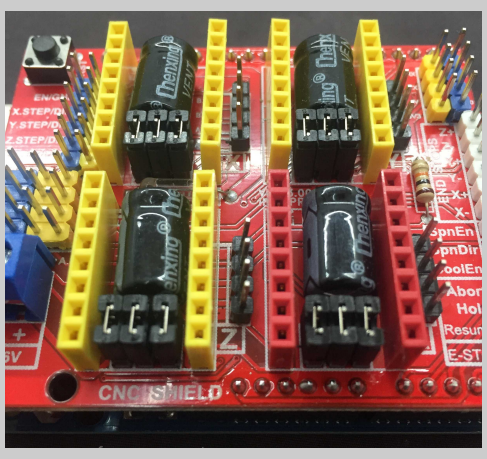
2. Ensure that your *DDCut* installation and *Arduino Drivers* are up to date

3. Plug the *Arduino R3* into your Host PC with a USB Cable, verifying that your device and/or driver management recognize the board. If you have not already installed the *DD2v7 Firmware* to the Arduino (and if the board was not provided with it pre-installed), do so by using the *Xloader.exe* flash utility provided with the DD2v7 driver package. If using XLoader to install the firmware, ensure that the Uno(Atmega328) is selected as the target Device, with 115200 as the Baud Rate and the correct COM Port selected.

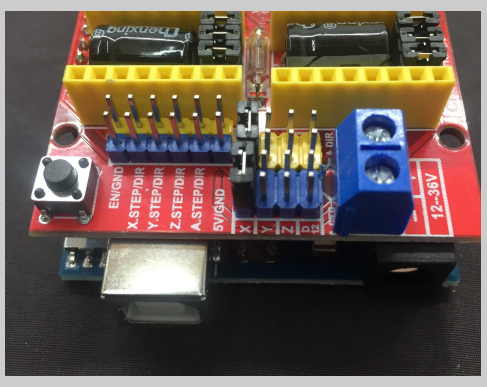
4. Unplug the *Arduino R3* from the *Host PC*. Transfer parts to a work surface that is free of static electricity and non-conductive. Make sure you have adequate room to work as well as your Host PC and a standard 110V AC outlet accessible.



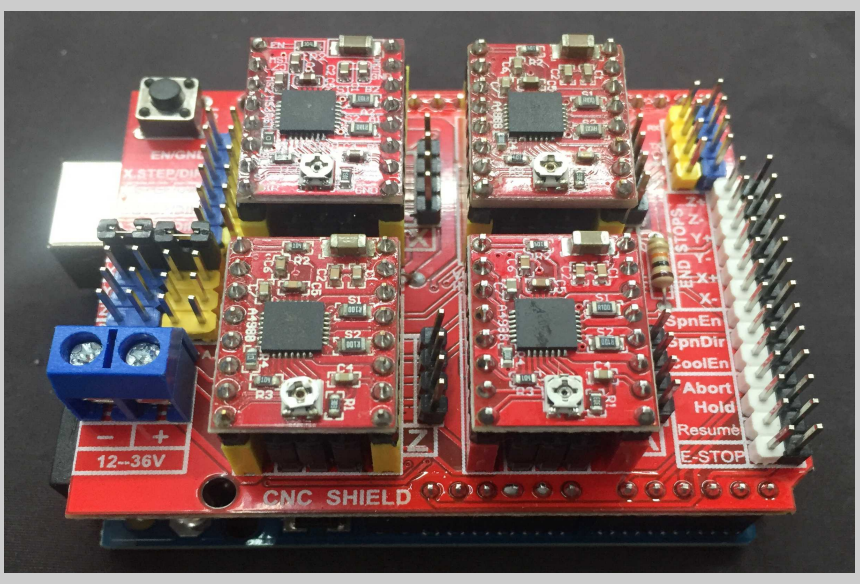
5. Attach the *CNC Shield* to the *Arduino* by lining up the corresponding pins, and then press down gently to fully insert them. If pins are slightly bent or don't match up properly by visual inspection, adjust until the two fit together with minimal force – don't apply too much pressure or force anything to go anywhere it shouldn't!



6. Attach three *Shorting Jumpers* to each of the *CNC Shield* stepper socket locations' microstepping pins (as pictured). This sets the hardware's microstepping setting for the drivers to the factory standard 1:16. The pin pairs can also be manually shorted to one another and/or soldered, but the ability to re-configure this setting is often helpful.



7. Attach two *Shorting Jumpers* across the four pins of the clone X-axis pins on the left side of the CNC Shield (as pictured). This clones the signal sent to the X-axis to the A-axis socket, providing separate drivers for each of the X-axis stepper motors. To conserve drivers/attempt to use the A-axis as a rotary 4th Axis (not recommmended due to the limited capabilities of the Uno's processor), a stepper cable splitter or Y-cable can be used to split the power supplied by a single driver instead.

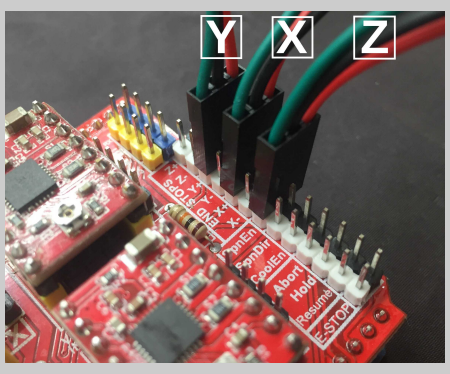


8. Insert the *A4988 Stepper Drivers* into the top of the *CNC Shield* (as pictured).

WARNING! STEPPER DRIVERS HAVE A HAND/ORIENTATION, MAKE SURE THAT THE A4988'S ARE INSTALLED EXACTLY AS PICTURED WITH THE 'ENABLE'/EN PINS MATCHED TO THE TOP LEFT CORNER OF EACH SOCKET (THE PIN ID'S ARE TYPICALLY CALLED OUT ON THE BACK OF THE DRIVER BOARD AND THE TOP LEFT OF THE SOCKET). IF USING DRV8825 DRIVERS INSTEAD, NOTE THAT THE CURRENT ADJUSTMENT POTENTIOMETER IS SWAPPED TO THE UPPER SIDE OF THE DRIVER BOARD.

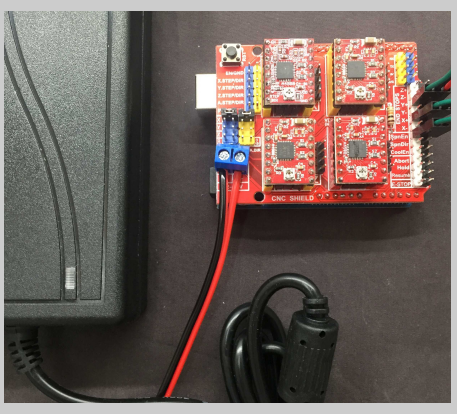
WARNING! (#2) NEVER POWER EITHER THE SHIELD OR ARDUINO WITH STEPPER DRIVERS INSERTED BUT NO MOTORS; THE DRIVERS WILL MISINTERPRET AN INFINITE LOAD ON THEMSELVES AND BURN UP!

9. Mount the *Arduino/CNC stack* to the *FLEX's frame* or place on a safe surface, then attach the cable from each driver to its corresponding motor on the frame. Color coding will vary by motor manufacturer, but no damage will be caused by attaching the cables backwards. If an axis does run backwards, flipping the cable around will solve this issue.



10. If using *endstops*, attach the *endstop cables* to the *CNC Shield*. For standard compatibility with DDCut, attach the X and Y endstop pairs to either of the "Y+/-" and "X+/-" pins respectively on the right side of the CNC Shield. Attach the Z endstop to the "SpnEn" (Spindle Enable) pin. These pins do not have a polarity and are only switched pairs.

- **Attach a *material probe* (if applicable) to either Z+/- pair**
- **Attach an *emergency stop switch* (if applicable) to the E-STOP pair at the bottom right**



11. Attach your *Power Supply or adapter* to the the DC Input pin screw terminals (marked 12-36V on most versions of the CNC Shield) at the bottom left of the Shield.

12. Plug in your *Power Supply*.

WARNING! ALWAYS PLUG YOUR POWER SUPPLY IN BEFORE CONNECTING THE ARDUINO TO YOUR HOST. THE ARDUINO RECEIVES POWER FROM YOUR HOST DEVICE WHILE THE SHIELD GETS IT FROM THE POWER SUPPLY. ATTEMPTING TO OPERATE THE ARDUINO/CNC FUNCTIONALITIES WITHOUT THAT POWER HAVE A LOW (BUT NON-ZERO) CHANCE OF FRYING THE ARDUINO.

13. Plug the *Arduino/CNC stack* into your *Host PC* with the USB cable. Start DDCut or your controller software of choice and confirm that the connection is recognized. Also always perform a quick visual inspection of the stack and connections prior to running any job files (in addition to the usual recommended checks of hardware for clearance, blockages, loose parts, etc. that might be a hazard).