

Software

- Arduino IDE
- Libraries (installed through Arduino IDE library manager). These versions worked – later versions may work as well:
 - SSD1306Ascii, version 1.3.5 (by Bill Greiman)
 - StepperDriver, version 1.4.1 (by Laurentiu Badea)
- Customized AsyncServoLib.zip from me - unzipped in the Arduino IDE libraries directory
- CoilWinder.zip – unzipped in Arduino projects directory

Bill of Materials

- Arduino Uno V2 Genuine or suitable clone
- Arduino Protoshield or suitable clone, preferably with pads for at least 18pin DIP IC socket
 - <https://www.amazon.com/gp/product/B00Q9YB7PI>
- 16x32 OLED display using SSD1306 I2C driver chip
 - <https://www.amazon.com/gp/product/B0761LV1SD>
- 5V Rotary Encoder Module
 - <https://www.amazon.com/gp/product/B06XQTHDRR>
- Pololu DRV8834 Low-Voltage stepper motor driver carrier or similar clone (use a low-voltage driver that is suitable for +5V motors):
 - <https://www.pololu.com/product/2134>
 - <https://www.digikey.com/en/products/detail/pololu-corporation/2134/10450428>
- .1" Female Headers – two 4 pin, two 8 pin and one 10 pin is enough
 - (Above Protoshield comes with enough)
- .1" Male header pins – one breakaway strip of 20 or five 4-pin strips is enough
- Hookup wire
- Small stepper motor that will run on 5V at low amperage (100-200ma). Low torque is better than high torque. Stepper will be run in bipolar (4-wire) mode.
 - <https://www.amazon.com/gp/product/B00B88DHQ2>
 - <https://www.elexp.com/products/29stp6motor-stepper-unipolar>
 - <https://www.digikey.com/en/products/detail/sparkfun-electronics/ROB-10551/5766908>
- Small servo – as accurate as possible

Hookup

Protoshield

Solder the one 10-pin, two 8-pin, and one 6-pin .1" male headers on the outer row of holes that mate with the Arduino. Make sure the pins are facing the BOTTOM side of the protoshield.

Solder the one 10-pin female header on the inner row of holes facing the TOP side of the protoshield

Solder the two 8-pin and one 4 or 6-pin female headers on the TOP side of the protoshield where the

Rotary Encoder

SSD1306 Display

Solder a 4-pin .1" male header pin block in the holes facing away from the display side

DRV8834