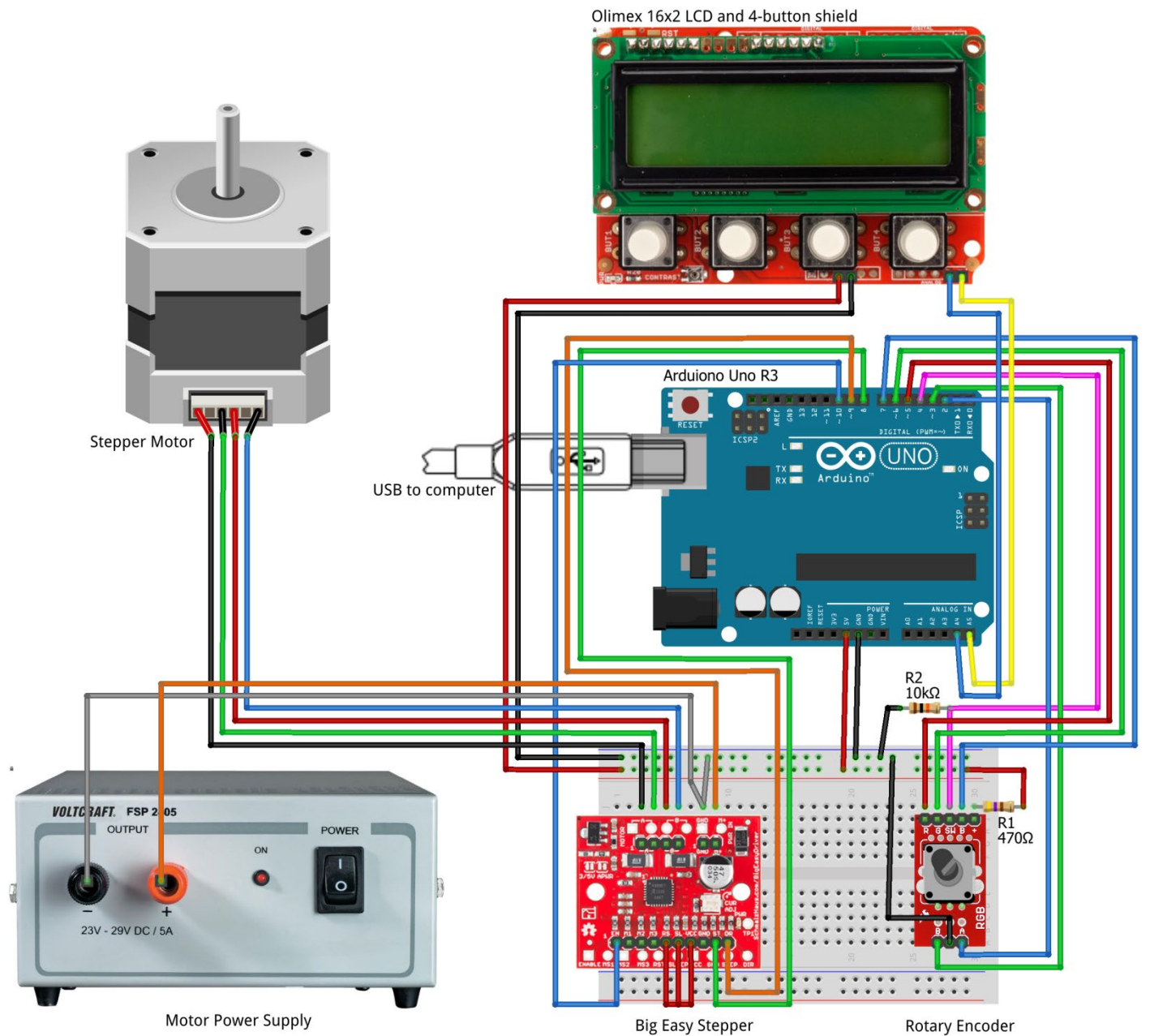# Electronics Wiring Schematic and Pinout - Needles-in-Ultrasound

version 1.2 - 26 March 2018
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https://github.com/MisitLab/needles-in-ultrasound

Olimex 16x2 LCD and 4-button shield

Arduiono Uno R3

USB to computer

Stepper Motor

Motor Power Supply

Big Easy Stepper

Rotary Encoder

R2 10kΩ

R1 470Ω

fritzing

Components:
- Arduino Uno Rev3 (A000066)
  https://store.arduino.cc/arduino-uno-rev3
- Olimex LCD Shield 16x2 (SHIELD-LCD16x2)
  https://www.olimex.com/Products/Duino/Shields/SHIELD-LCD16x2/open-source-hardware
- Sparkfun Big Easy Driver (ROB-12859)
  https://www.sparkfun.com/products/12859
- Sparkfun Illuminated Rotary Encoder on breakout board (COM-10982 + BOB-11722)
  https://www.sparkfun.com/products/10982
  https://www.sparkfun.com/products/11722
- WanTai Motor 42BYGHM809 Hybrid Bipolar Stepper Motor
  http://www.wantmotor.com/product/42byghm.html
- USB 5V power from computer for Arduino
- Lab 24V power supply for motor

		wire color	connected to
Arduino Uno pinout:			
0.	-		
1.	-		
2.	rotary encoder A (interrupt)	blue	Rotary Encoder pin A
3.	rorary encoder B (interrupt)	green	Rotary Encoder pin B
4.	rotary pushbutton	pink	Rotary Encoder SW
5.	LED red	red	Rotary Encoder LED R
6.	LED green	green	Rotary Encoder LED G
7.	LED blue	blue	Rotary Encoder LED B
8.	motor step	green	Big Easy driver STEP
9.	motor dir	orange	Big Easy driver DIR
10.	motor enable	blue	Big Easy driver EN
11.	-		
12.	-		
13.	(built-in LED)		
A0.			
A1.			
A2.			
A3.			
A4.	I2C SDA	blue	LCD Shield SDA
A5.	I2C SCL	yellow	LCD Shield SCL
5V.	5V power	red	5V line (rail) on breadboard
GND.	ground	black	GND line (rail) on breadboard

Motor signal cable pinout:

Big Easy	wire color	connected to
A+	black	Stepper Motor A+
A-	green	Stepper Motor A-
B+	red	Stepper Motor B+
B-	blue	Stepper Motor B-

Motor power cable pinout:

Big Easy	wire color	connected to
M+	orange	Motor Power Supply +
GND	grey	Motor Power Supply GND & GND line (rail) on breadboard