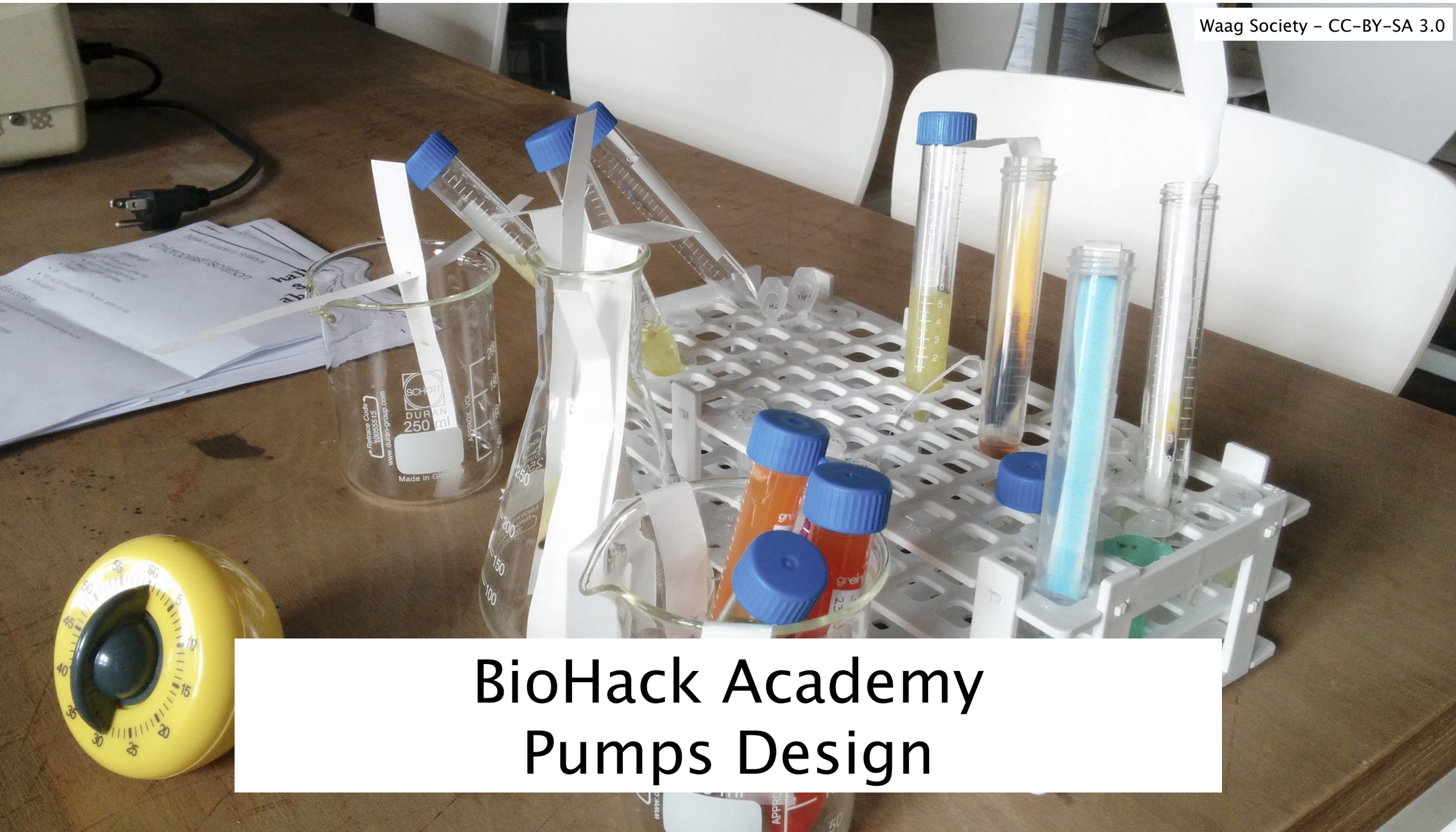
waag society

institute for art, science and technology



BioHack Academy
Pumps Design

Content

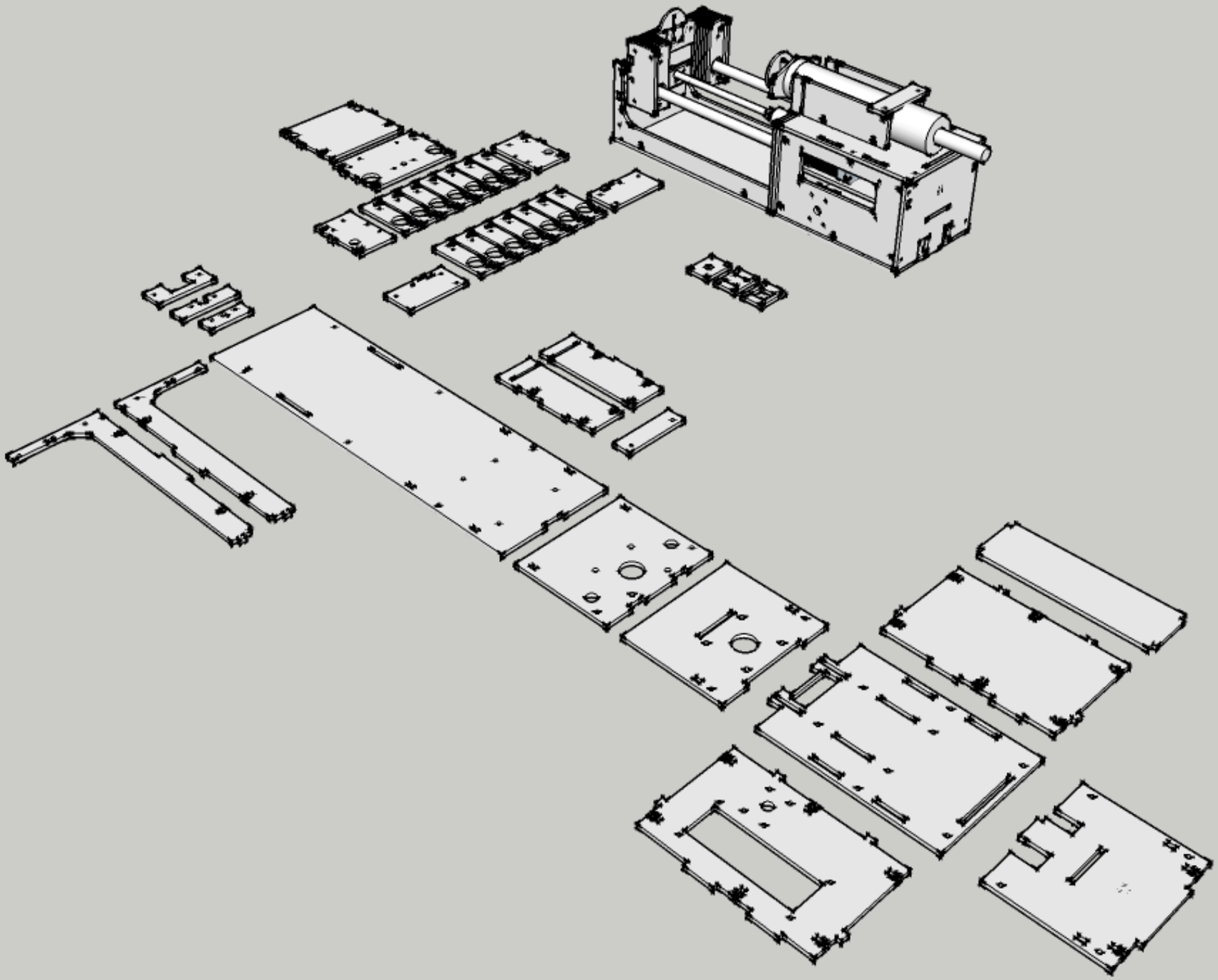
- Syringe pump
- Peristaltic pump

waag society

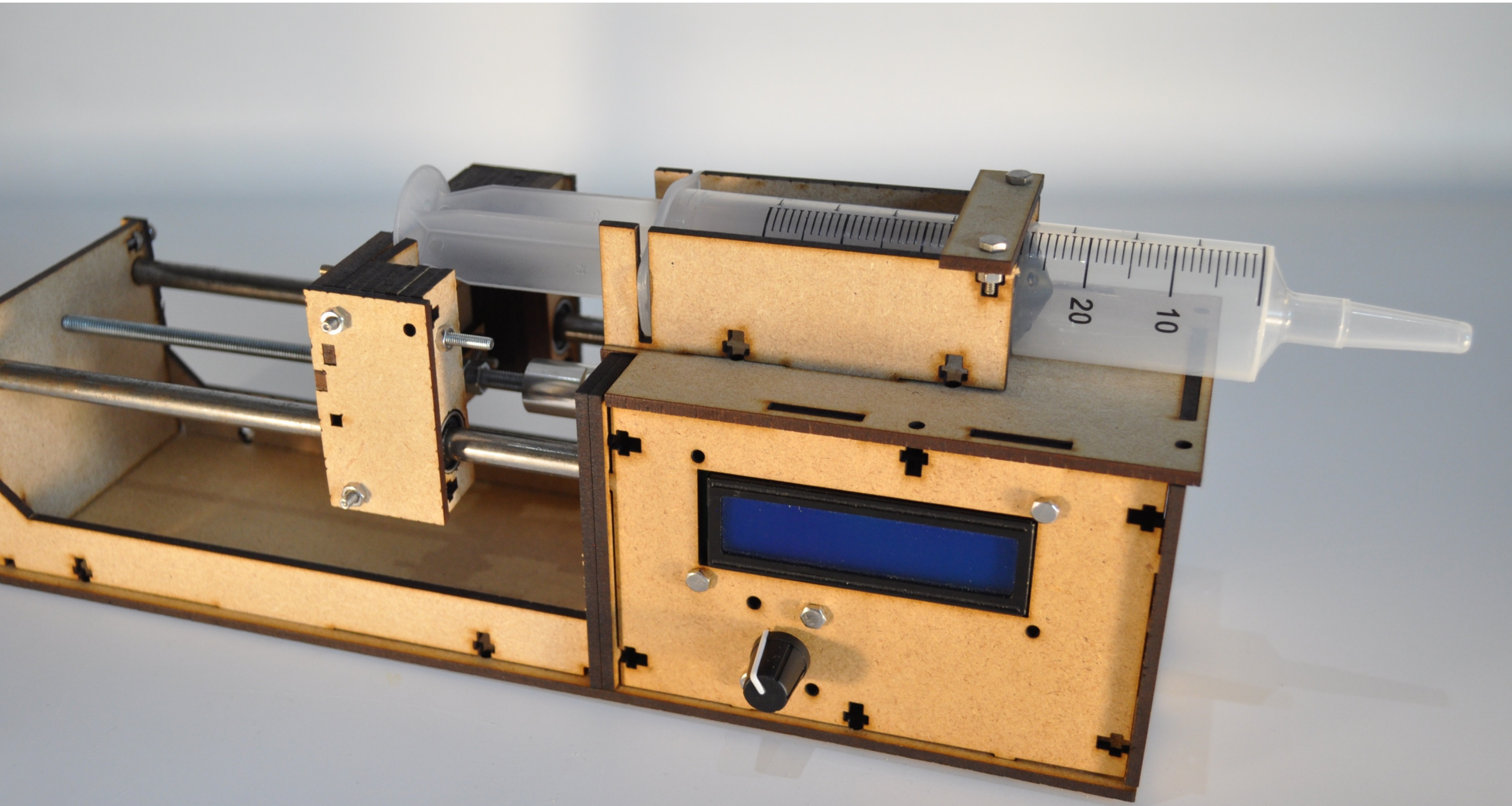
institute for art, science and technology

Syringe Pump

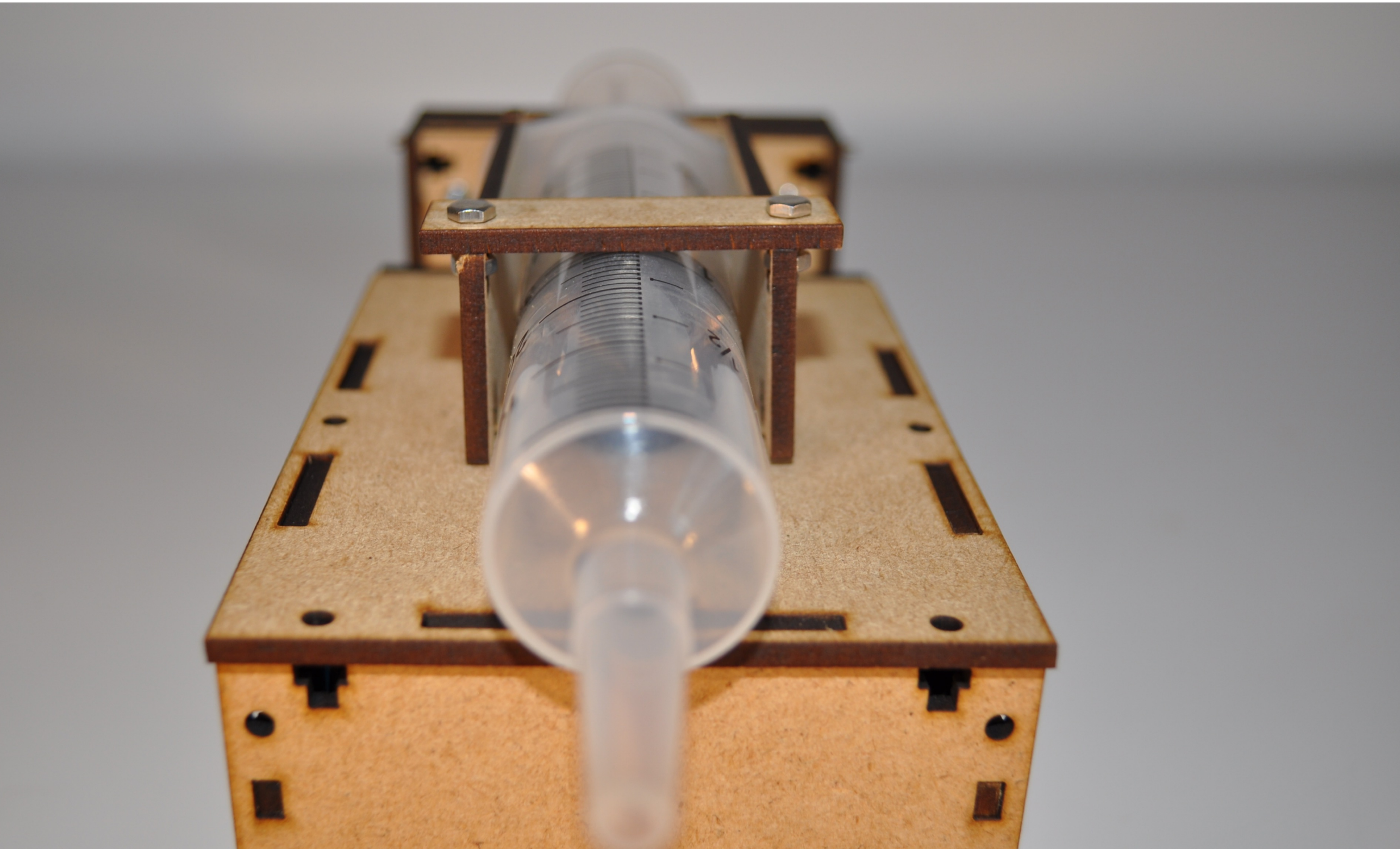
BioHack Academy design



BioHack Academy design



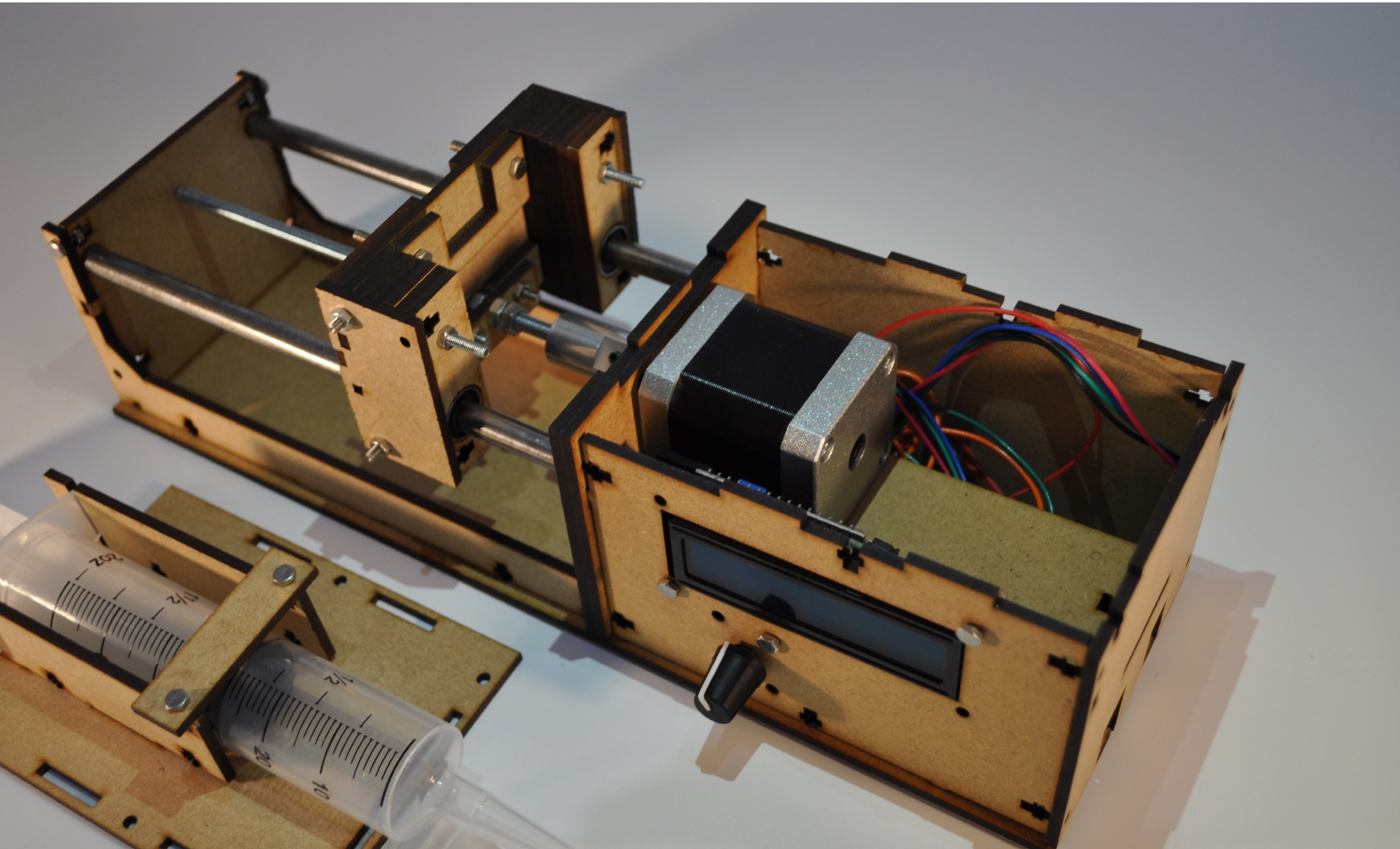
BioHack Academy design



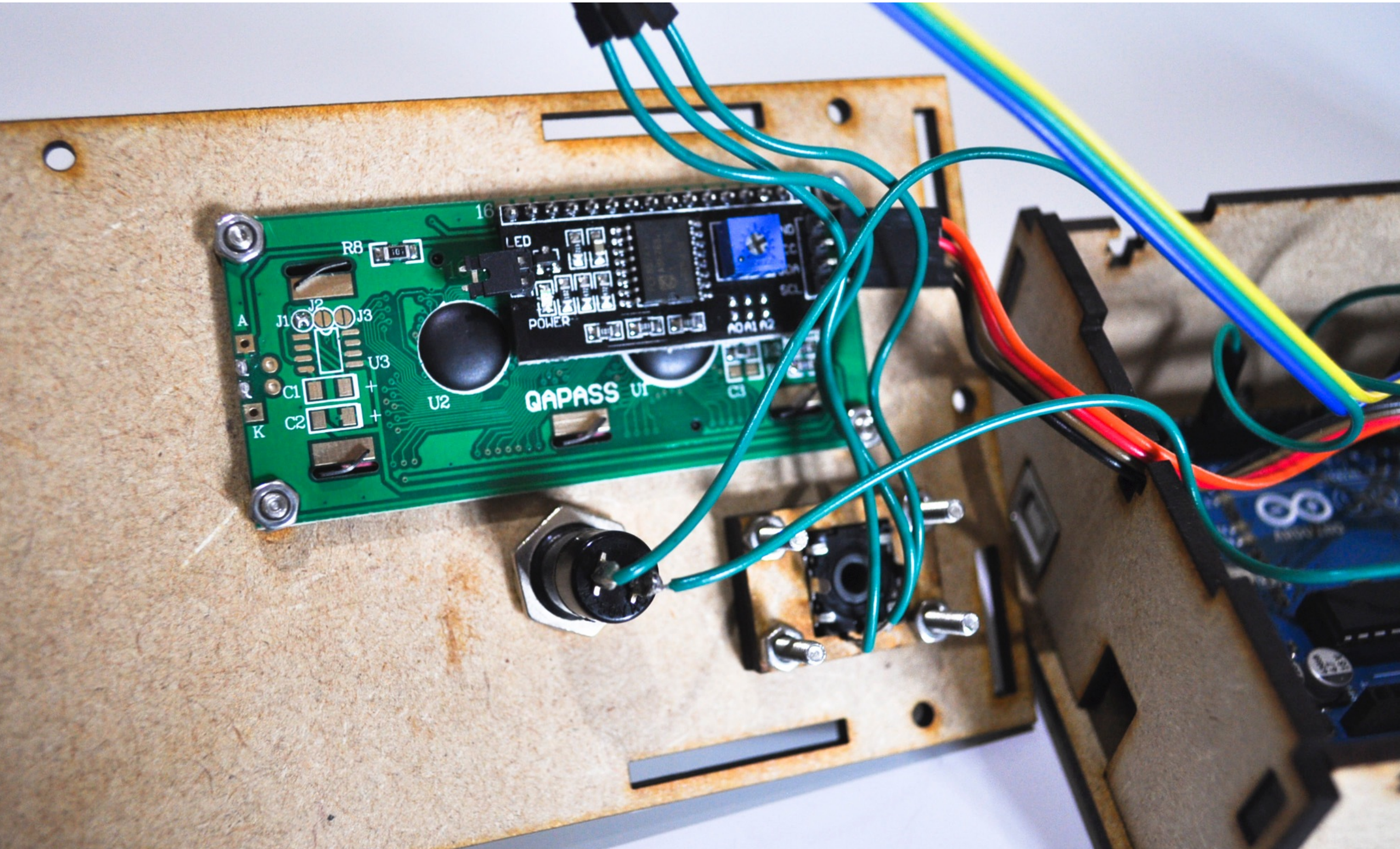
Bill of Materials

No	Amount	Description	Supplier NL	Cost
1	1	NEMA17 Stepper motor	RepRapWorld	12.50
2	1	Pololu Stepper Driver	RepRapWorld	11.99
3	1	8mm smooth rod	RepRapWorld	2.99
4	2	LM8UU Linear Bearings	RepRapWorld	1.99
5	1	Axis coupling	RepRapWorld	1.99
6	1	M5 threaded rod	RepRapWorld	2.15
7	3	Hexagonal M5 nut	RepRapWorld	0.09
8	1	100 uF capacitor	RepRapWorld, Farnell	0.20
9	1	Rotary encoder	Farnell, iPrototype, EOO	0.42
10	1	Knob	Farnell	0.23
11	2	10K resistor	Farnell, EOO	0.03
12	2	10nF capacitor	Farnell, iPrototype, EOO	0.14
13	2	100nF capacitor	Farnell, EOO	0.14
14	1	12V 5A Power supply	Farnell, EOO	38.13
15	4	Rubber feet	Conrad	0.08
16	1	I2C LCD display	iPrototype, Hackerstore	8.95
17	1	Breadboard	Farnell. iPrototype	2.56

Electronics

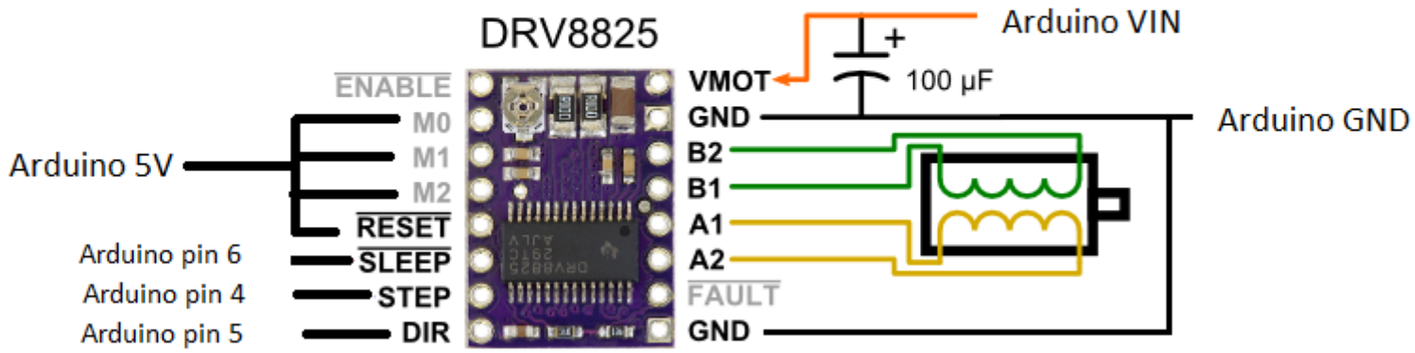


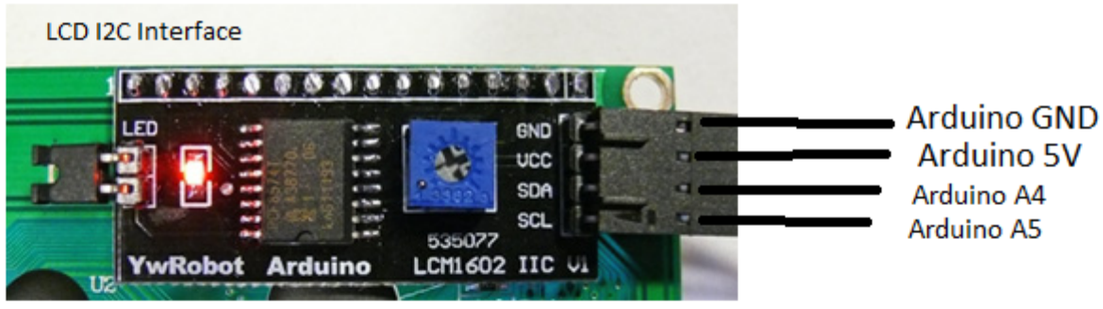
Electronics

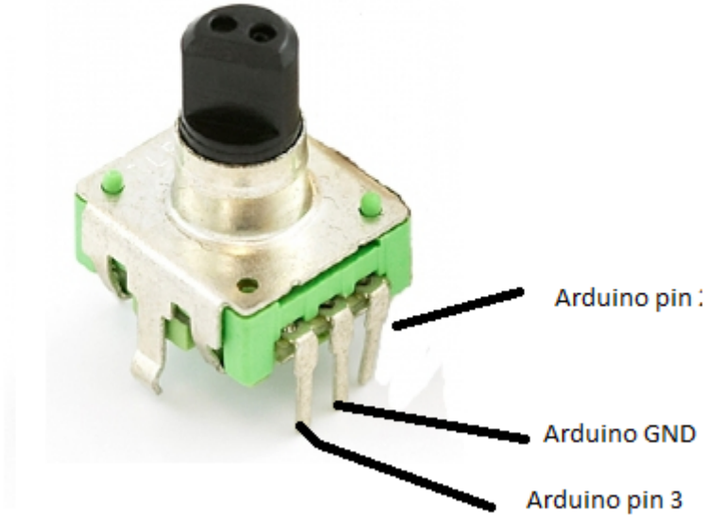


Component Wiring

Peristaltic Pump
connection diagram







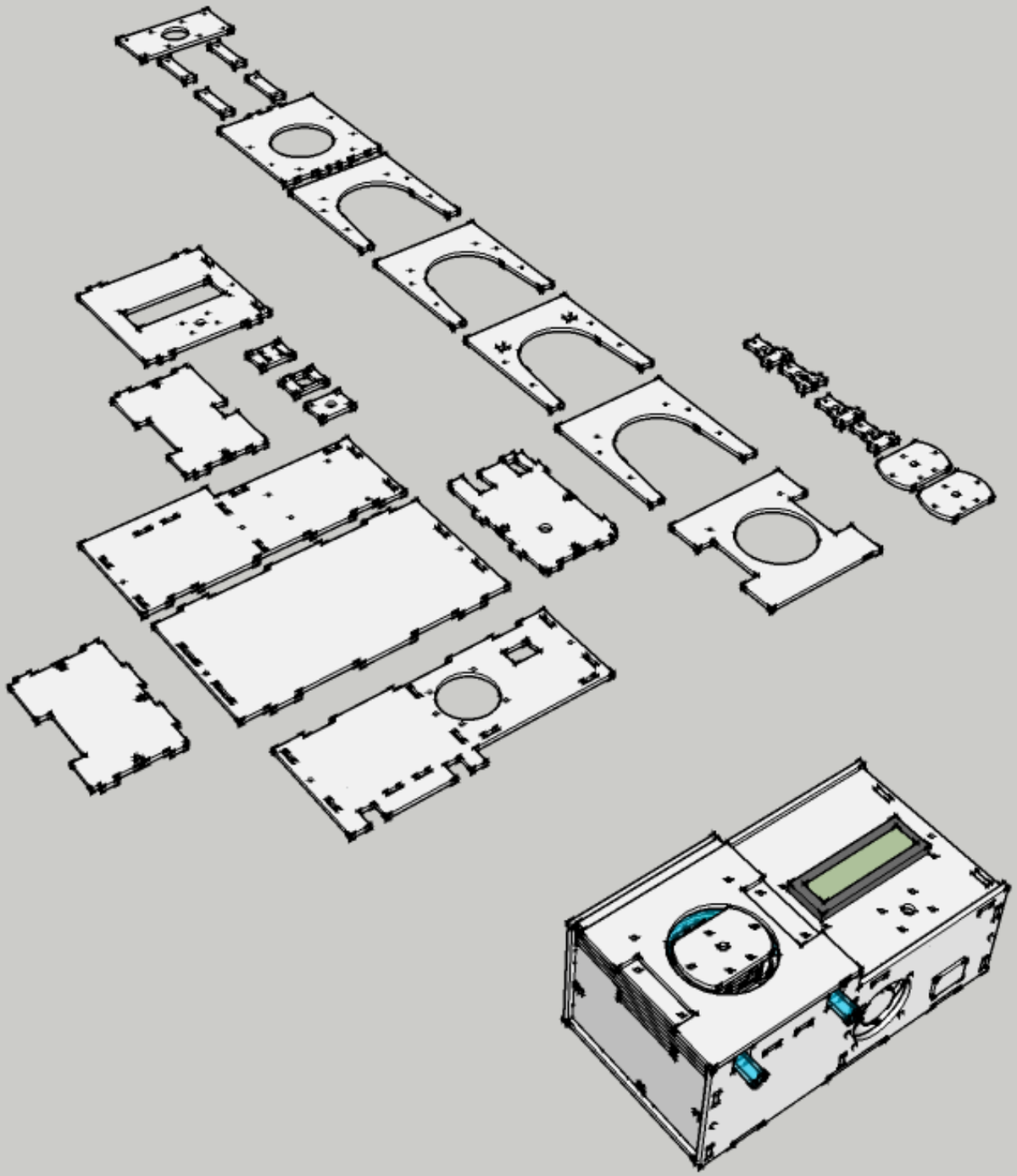
Connect to arduino
pin 7 and GND

waag society

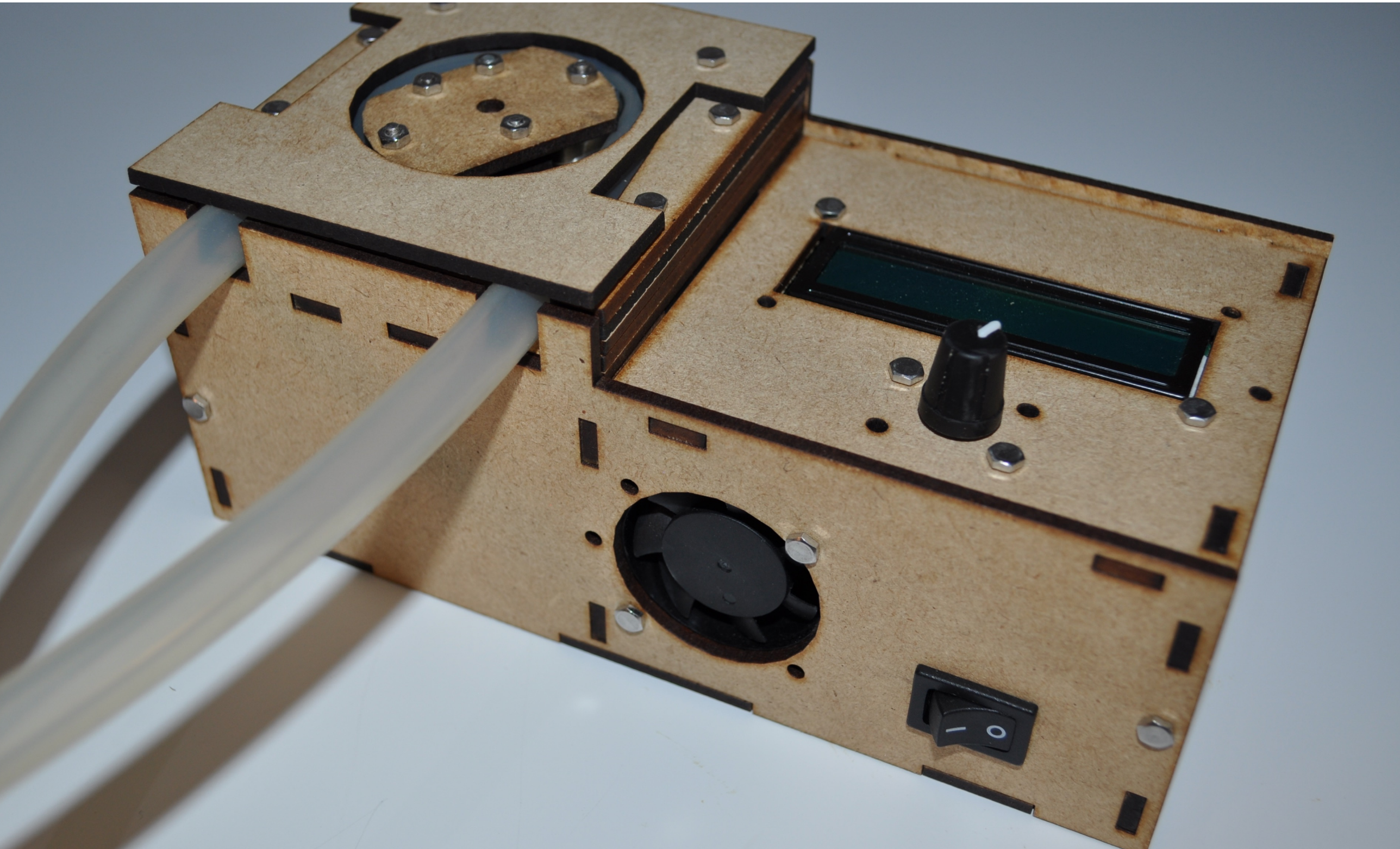
institute for art, science and technology

Peristaltic pump

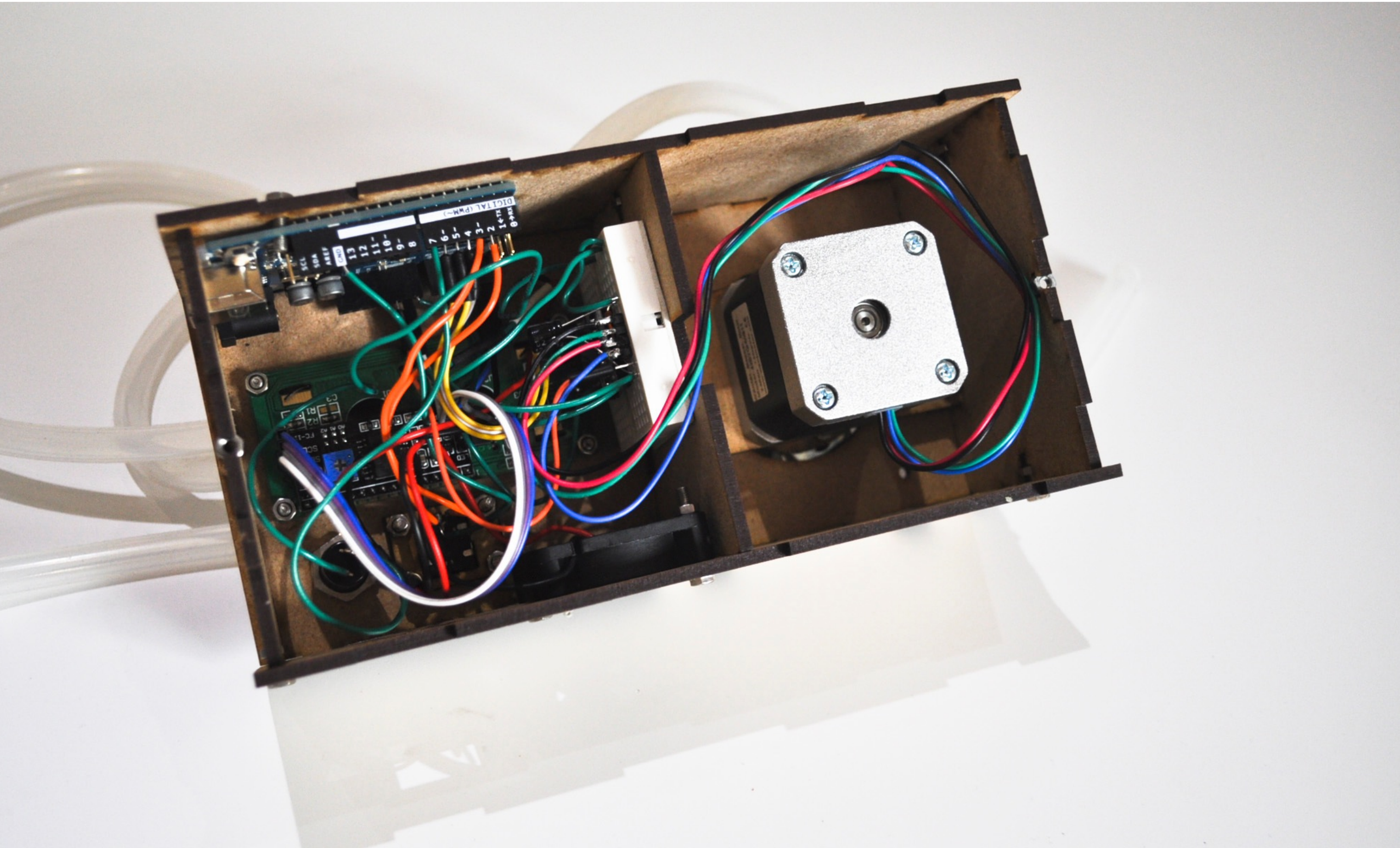
BioHack Academy design



BioHack Academy design



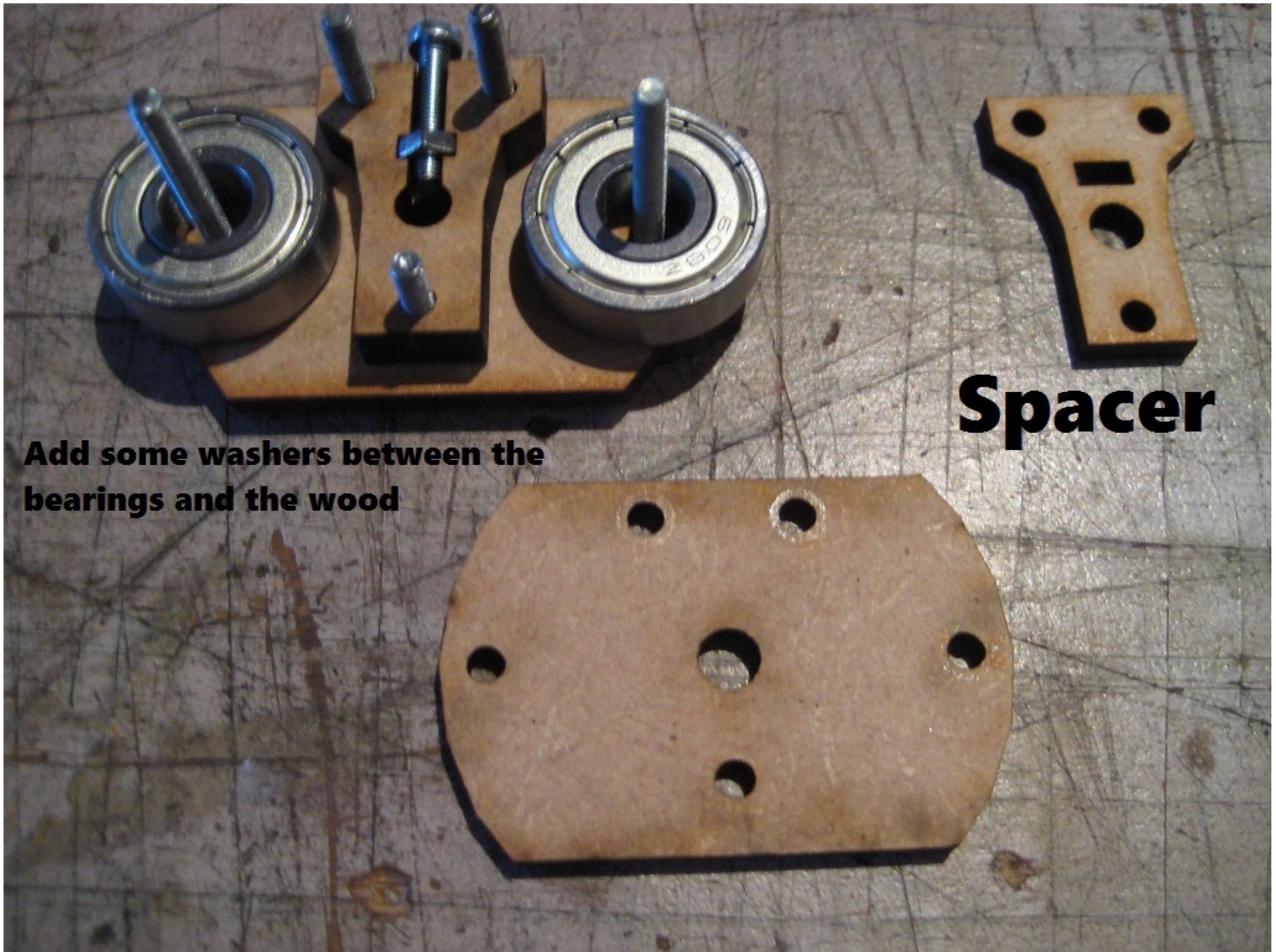
BioHack Academy design



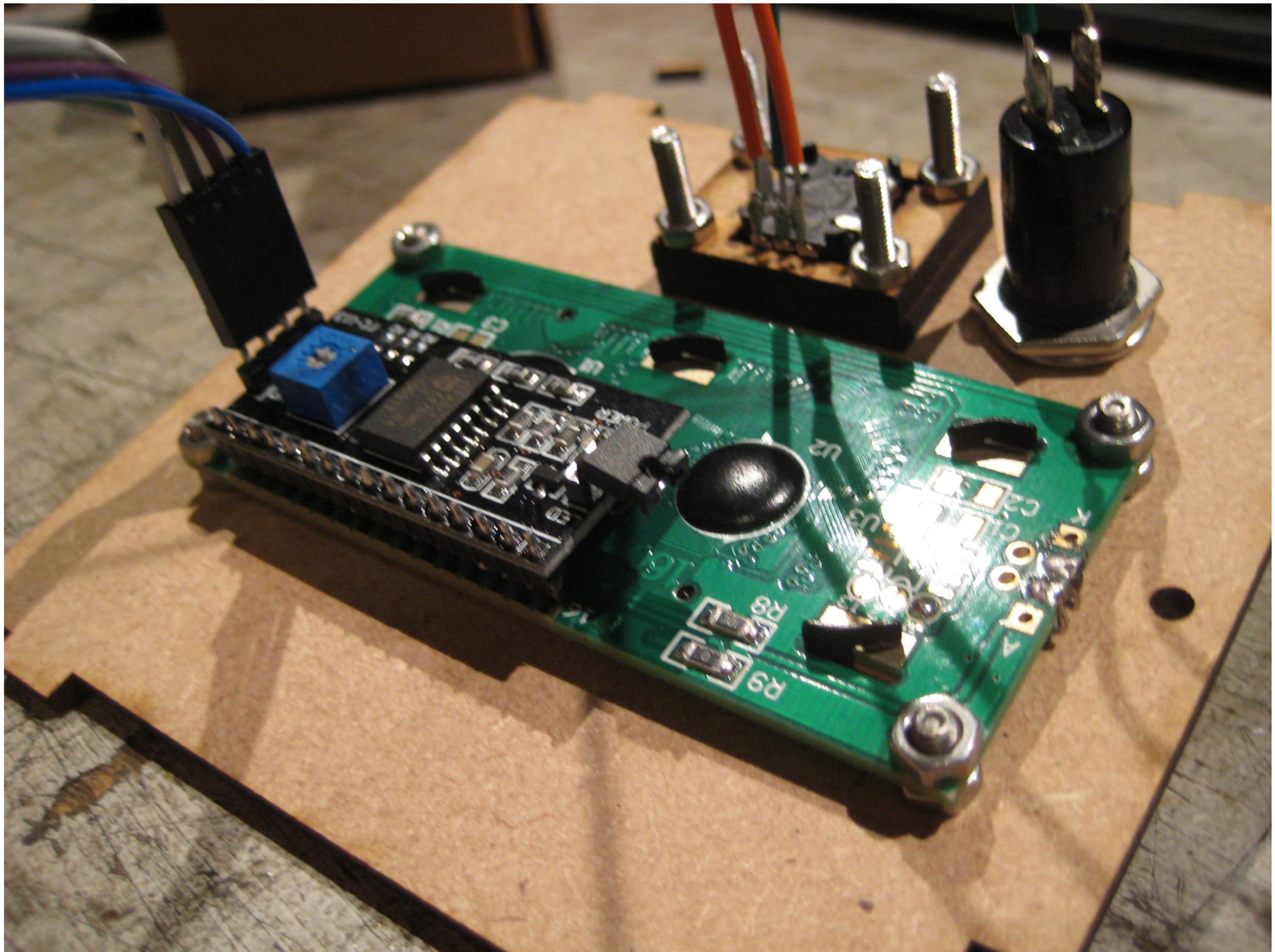
Bill of Materials

No	Amount	Description	Supplier NL	Cost
1	1	NEMA17 Stepper motor	RepRapWorld	12.50
2	1	Pololu DRV8825 Stepper Driver	RepRapWorld	11.99
3	2	Bearing 608ZZ	RepRapWorld	0.25
4	1	100 uF capacitor	RepRapWorld, Farnell	0.20
5	1	Heatsink	RepRapWorld	1.25
6	1	10 pack washers	RepRapWorld	1.99
6	1	Fan 40x40mm	EOO	1.55
7	1	Rotary encoder	Farnell, iPrototype, EOO	0.42
8	1	Knob	Farnell	0.23
9	2	10K resistor	Farnell, EOO	0.03
10	2	10nF capacitor	Farnell, iPrototype, EOO	0.14
11	2	100nF capacitor	Farnell, EOO	0.14
12	1	12V 5A Power supply	Farnell, EOO	38.13
13	4	Rubber feet	Conrad	0.08
14	1	I2C LCD display	iPrototype, Hackerstore	8.95
15	1	Breadboard	Farnell. iPrototype	2.56

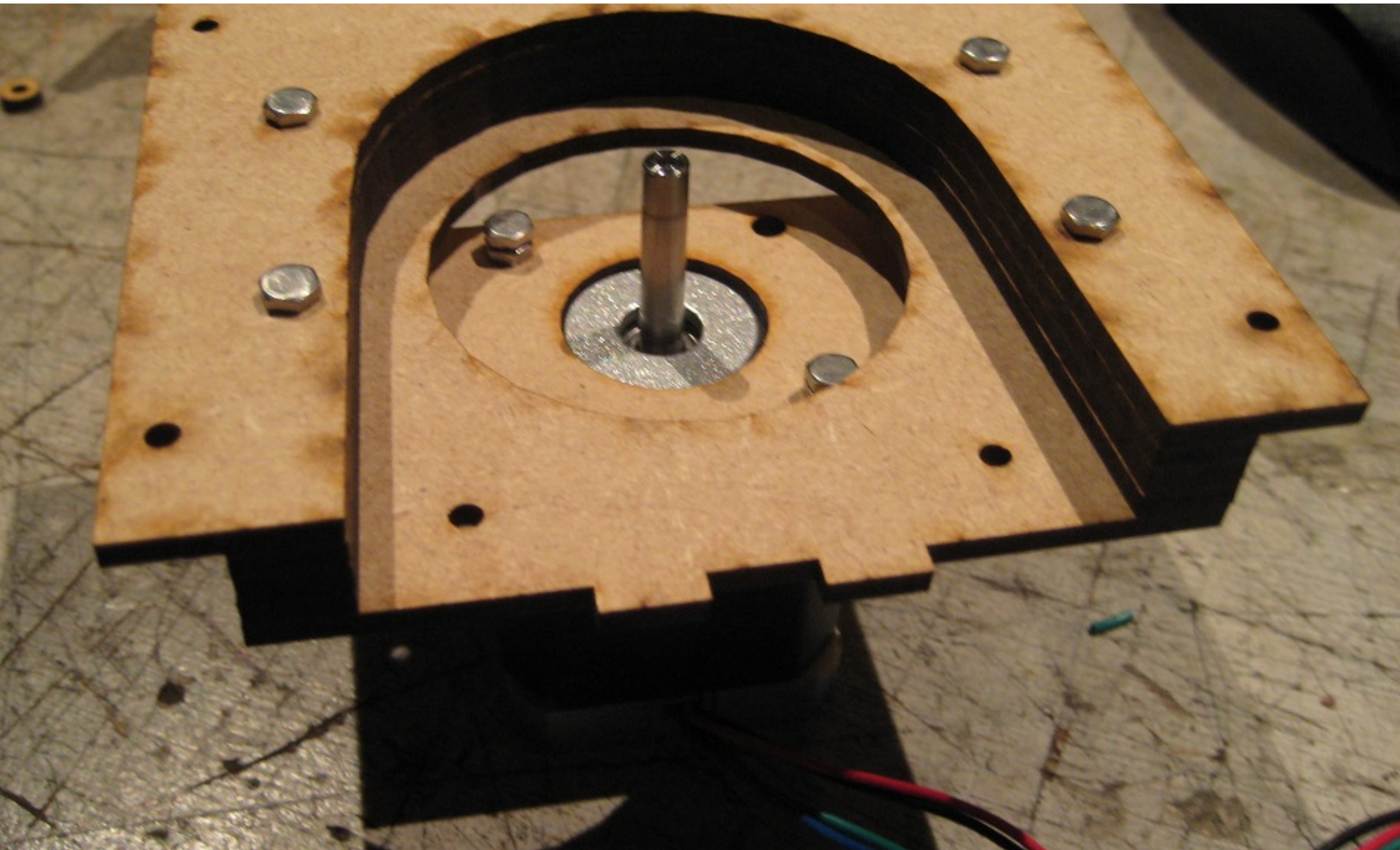
Axismounted bearings


Spacer
Add some washers between the bearings and the wood

Control panel

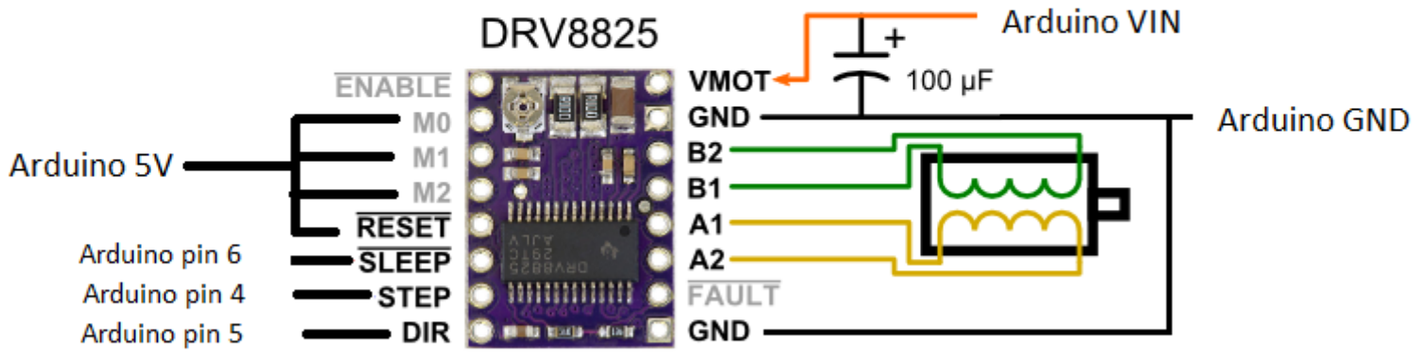


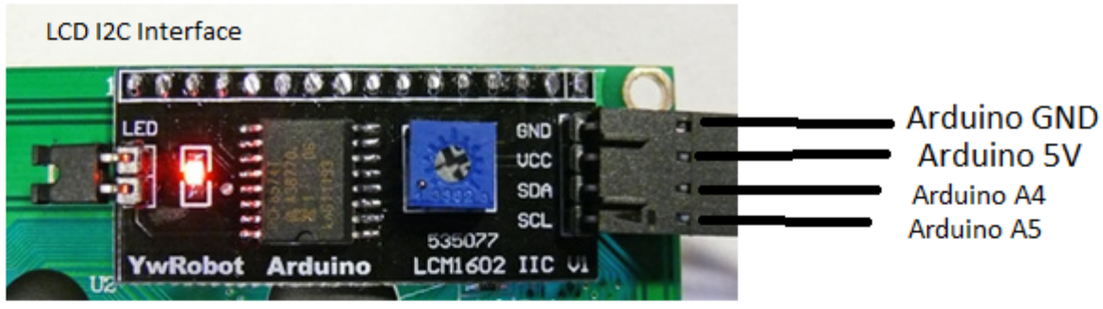
NEMA17 mount

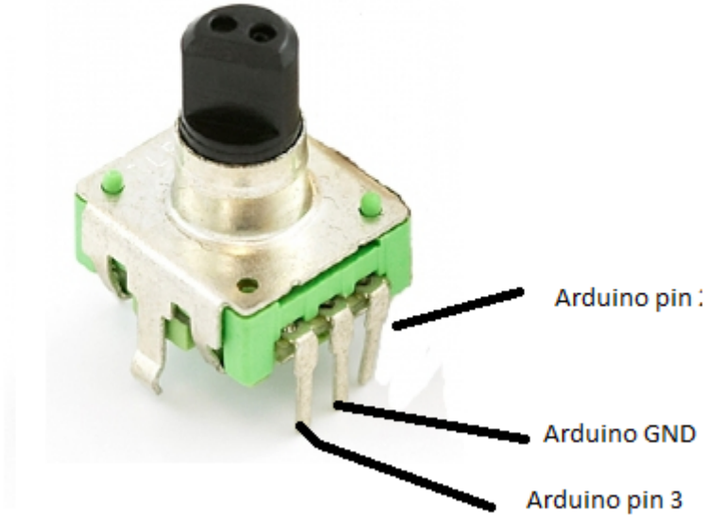


Component Wiring

Peristaltic Pump
connection diagram

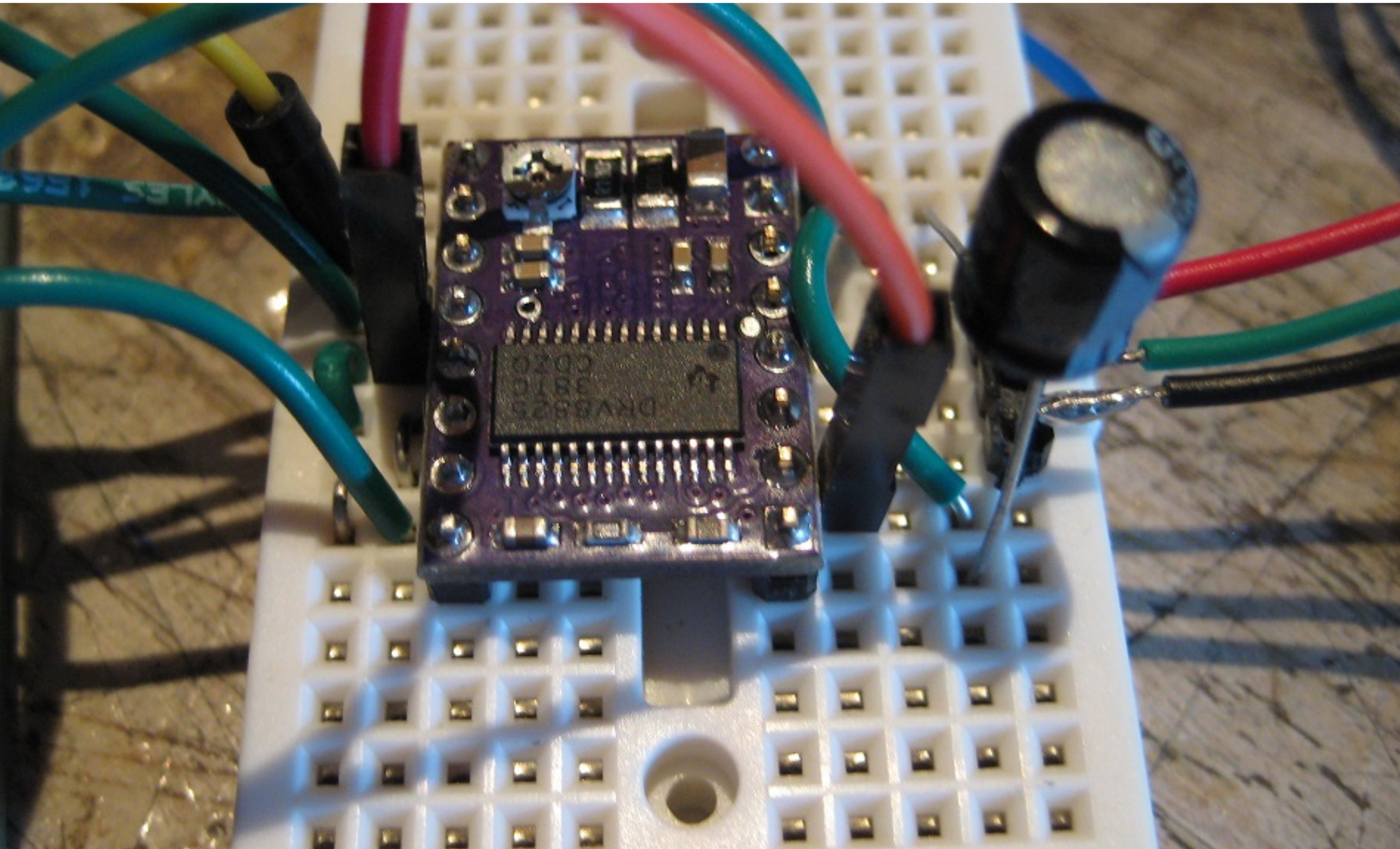




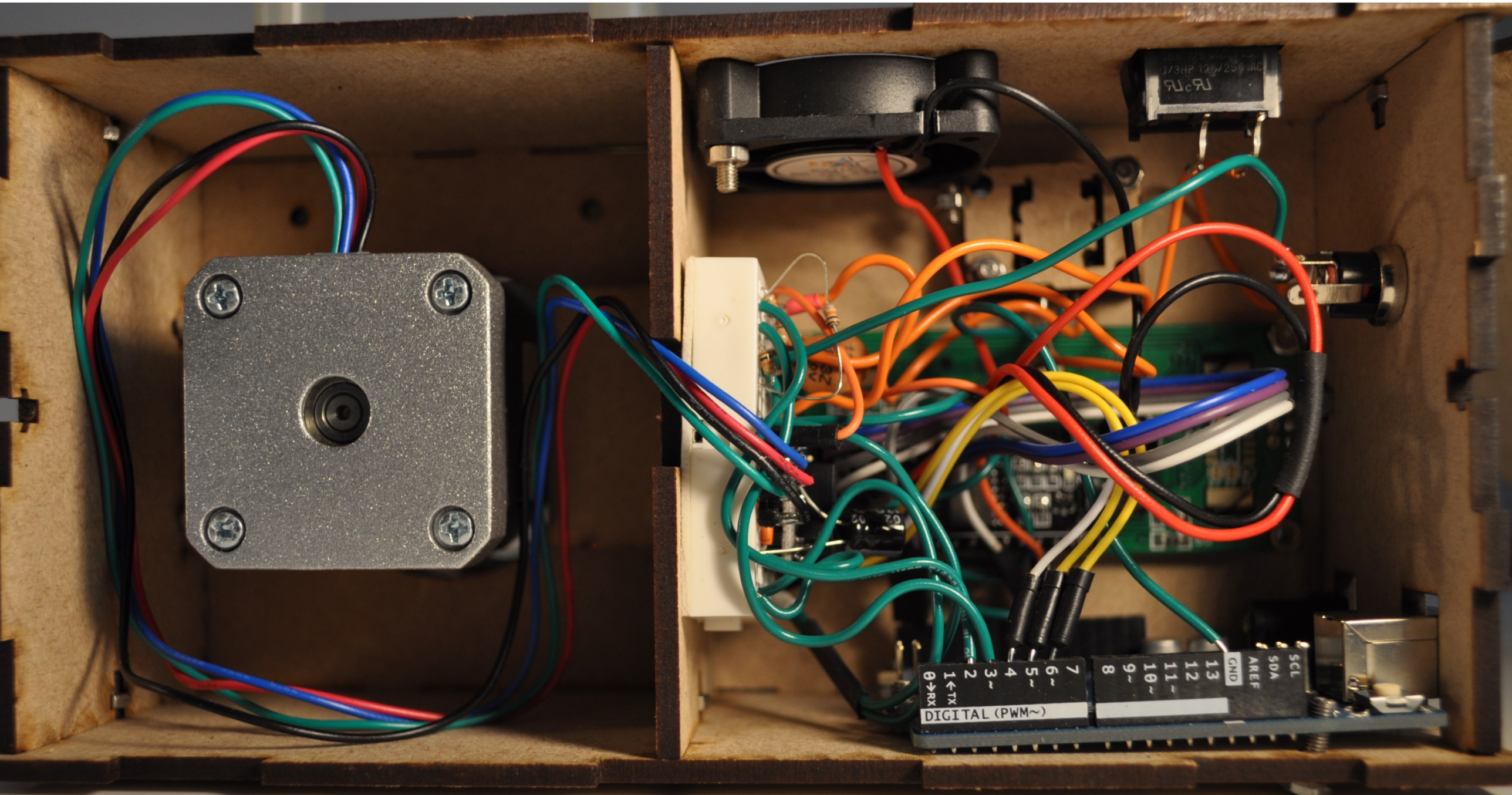


Connect to arduino
pin 7 and GND

Stepper driver



Full assembly



waag society

institute for art, science and technology

Demonstration

http://www.youtube.com/watch?v=rvNwhfQSCfg

These slides are published by Waag Society under CC-BY-SA 4.0 license