OI Bioreactor Design

Turbidity Sensor

Flow sensor for arduino

Peristaltic Pump

OD Sensor Unit

Seal container with polyurethane custom printed lid

HDPE F Style Container

pH sensor for arduino

Silicone heating pads on both sides

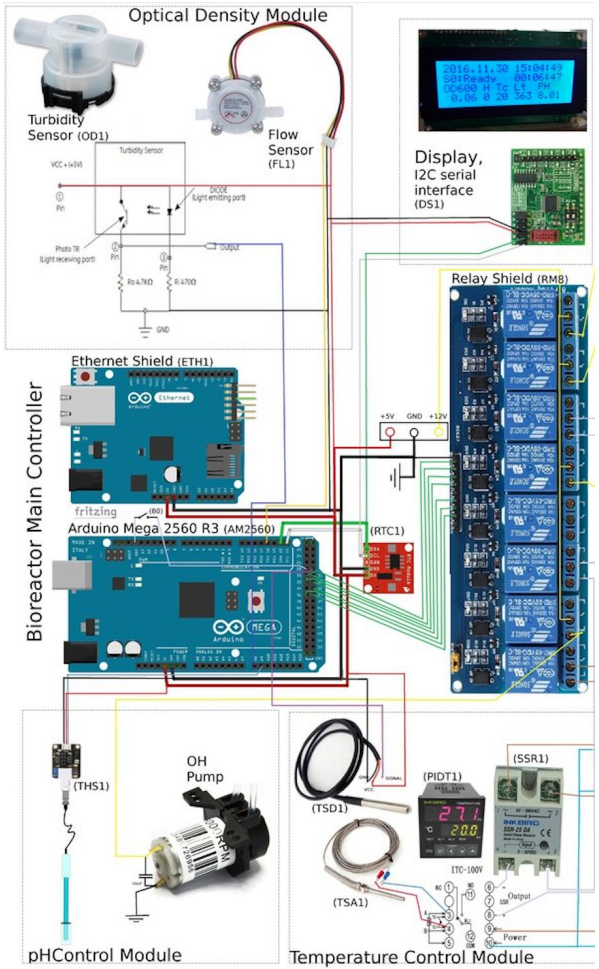
Teflon tubing

Air pump

Aquarium air stone

Waterproof DS18B20 Digital temperature sensor

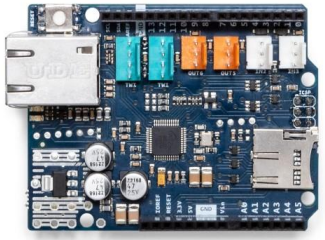
Bioreactor Control System



Marinescu and Popescu (2018)

Inspiration

Ethernet Shield w/ SD card



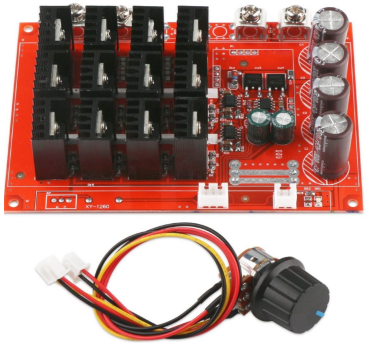
LCD Display

Arduino Mega 2560

ATX Power Supply

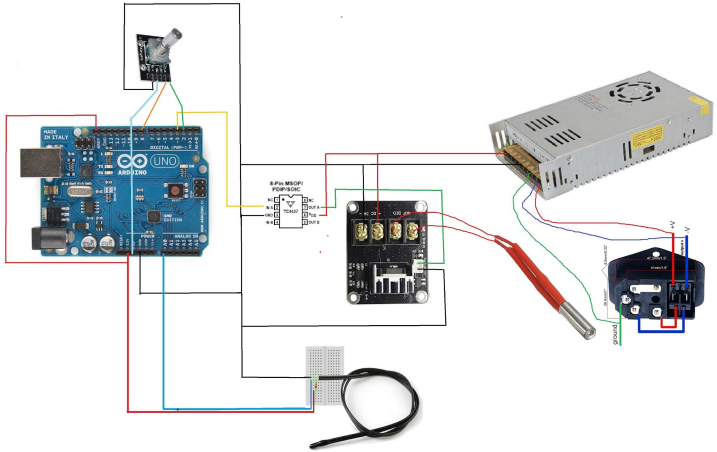
Temperature Control

Waterproof DS18B20 Digital temperature sensor



Motor Controller

Silicone Heating Pads placed on each side of the vessel



Example of an Arduino PID Control

1. Bleach the reactor body with 167mg tablet of NaDCC in 5L of hot tap water. Let sit for an hour rotating the bottle from time to time
2. Dump everything and rinse very thoroughly with 2L of hot freshly autoclaved distilled water, 250ml at a time and always hot.
3. Prepare media by autoclaving 3L of distilled water and adding it one liter at a time (extremely hot and while under laminar flow) then add 1L of media
4. Put the bubbler line and thermometer in a cup of 70% isopropyl for 10 minutes and then let it sit in a liter of sterile hot distilled water until ready to use

References

1. Marinescu GC, Popescu RG. 2018. Open-Source bioreactor controller for bacterial protein expression. *PeerJ Preprints* 6:e27150v1 https://doi.org/10.7287/peerj.preprints.27150v1
2. Sebastian Cocioba's Bioreactor Design (Presentation on 6/18)