



### Sawyer PointOne™ Filters

- Gravity-fed point-of-use filter
- Hollow fiber membrane (0.1 μm pores)
- Shown to reduce incidence of diarrheal disease by 78% over 12 weeks.
- New filters have been shown to meet EPA recommendations of at least 6 log removal of bacteria.
- A properly maintained filter should be able to treat 1 million gallons.

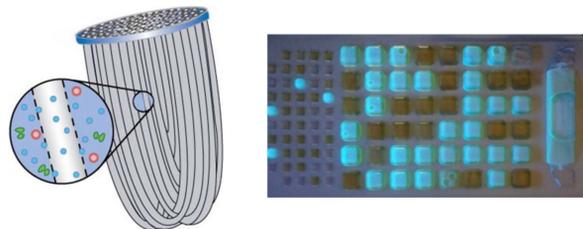


### Specifications

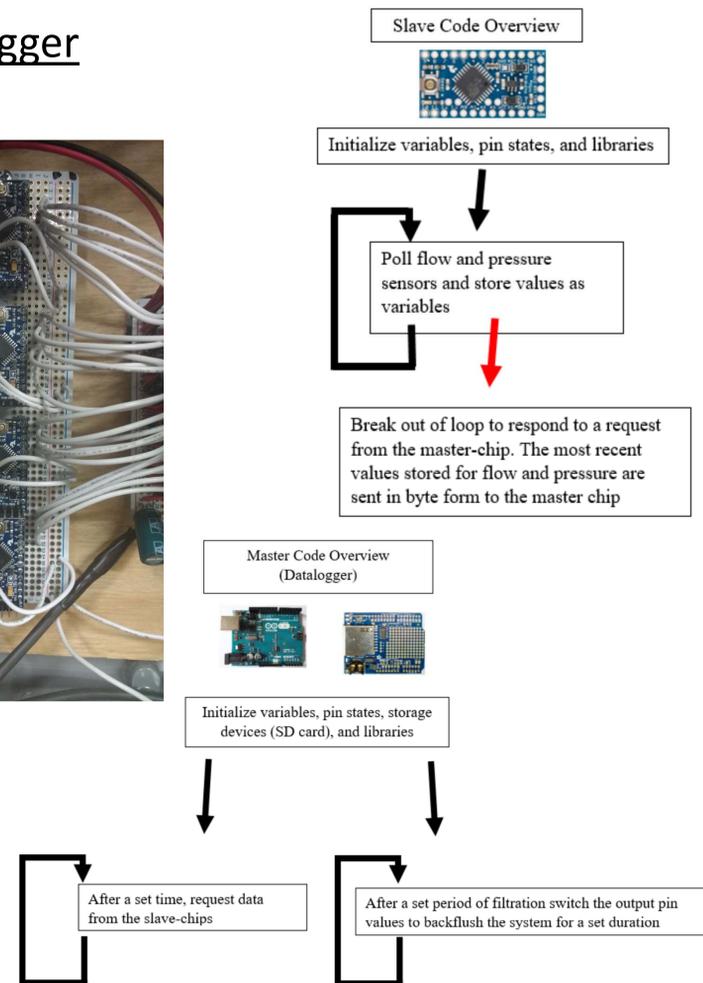
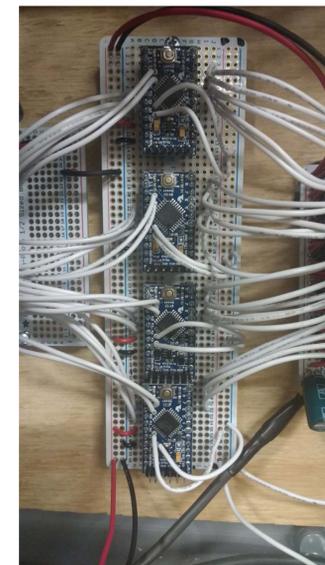
A primarily self sustaining system that is able to cycle one million gallons of water through the Sawyer PointONE™ filters, allowing for removal and testing periodically.

### Goals

- To assess the long term performance of Sawyer PointONE™ hollow fiber membrane filters in bacteria removal. We do this by stressing the filters by cycling water constantly through them.
- To regularly asses if the filters have passed bacteria removal testing, according to EPA standers of at least 6 log reduction (or 99.9999% removal).

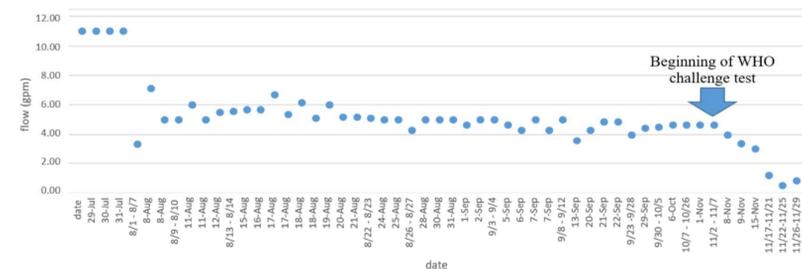


### Data-Logger



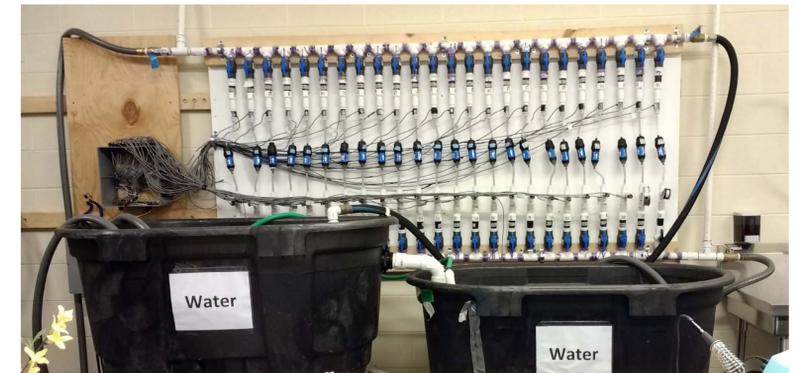
### Flow Rate

- A major issue that we have encountered is a weak flow through the system.



### System Design and Layout

- Water is pumped from the right tank, up through the 24 filters, and into the left tank. When the water level reaches a specified point in the left tank it overflows back into the right tank.
- The water passes through two sensors. The first measures pressure, which is restricted to 10 psi before it reaches the filters. And the second measures flow. Both are recorded on a SIM card stored next to the system.
- The tanks are raised up on blocks to be at a more even level to the filters. This is done to prevent air locks in the system.



### Observations and Troubleshooting

Paint flecks, rust, and precipitated hardness were observed in the system. To fix these issues and avoid weak flow, the following changes were made:

- The filters were taken down and the entire system was flushed with a weak acid solution.
- Tubing was replaced.
- The pumps were disassembled, cleaned, and painted with marine paint to avoid rust and flaking.
- A reverse osmosis system with deionized water was installed for the filter feed water to better control the water quality.

### Conclusions

- The filters are being biologically tested and the system is set up to run for several years.

### Acknowledgements

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