1   Overview

So these are just a few of my thoughts that seemed worth writing down when it comes to the design and implementation of the datalogger. Feel free to push back.

2   Design criteria

1. Low cost

2. Durability (must be weatherproof)

3. Ease of use

4. Easy to build

5. Modularity

3   Intended market

Students and teachers with "typical" technical backgrounds. Teachers will want to use this in a lesson plan and give them to students from ages 8-80. Private, public schools, afterschool programs, parents, people who want to include a temperature sensor in their projects: in general, this is targeted at people who want a quick solution to the temperature logging problem.

4   Use cases

- **Teachers running a unit on global warming**

  Teachers are looking to run a unit on global warming. As part of this, they want students to create and play with a biosphere in various incarnations. Ranging from glasses filled with different gases and exposed to heat to a full ecosystem, they want to be able to explore these experimental environments. They teach high schoolers, and want to have a school set which will last essentially indefinitely. They want to be able to schedule the frequency of the datalogging and the length of time for which it runs. This means they should be able to either enter a number of days, or a date, and they

should be able to choose how frequently it logs data in a convenient set of units (once a day, hour, minute, week, year). The teachers are happiest working with an SD card or USB thumb drive. If economical, we should support both.

- Someone interested in sensing the temperature in their aquarium

  This person will want an easy way to plop the sensor into their aquarium, and then run a wire out (or easily access wirelessly) the temperature and put it into a text file or maybe run a script that could display the temperature over time. They should also be able to push a button and see the current temperature.

- An artist interested in making an installation that reacts to temperature

  This person would either want the data in text or as a real time buffer, or would like direct access to the voltage the temperature sensor generates (for passing onto the rest of the installation's hardware).

- A person interested in getting into electronics, and wants to make a kit

  This person is just looking for an easy, low cost introduction to electronics and wants a solderable kit where they can get a bag of parts, follow some instructions, and get something that spits out a temperature.

5 Physical design

Sloan: here's some of my thoughts on what should govern how the datalogger looks. Let me know if I'm doing too much backseat driving, or if this input is valuable. I'd be interested to hear the reasoning behind your design decisions, when that time comes.

This should be a tool that both adults and kids find attractive, and take seriously. Muted, but colorful? It should be something that is waterproof, but easy to take apart. Significant bonus points of working forward from readily available cases or materials: keep in mind that we want to make this a kit, too. Rather than aim for an integrated hardware experience like the

iPod, we want there to be a bit more transparency. I assume it's possible to come up with a good user design without needing to manufacture a case from scratch. There should be clear, easy to use buttons or switches to turn the machine on or off, clear feedback about the current UI context, easy number entry. Maybe a lit screen?