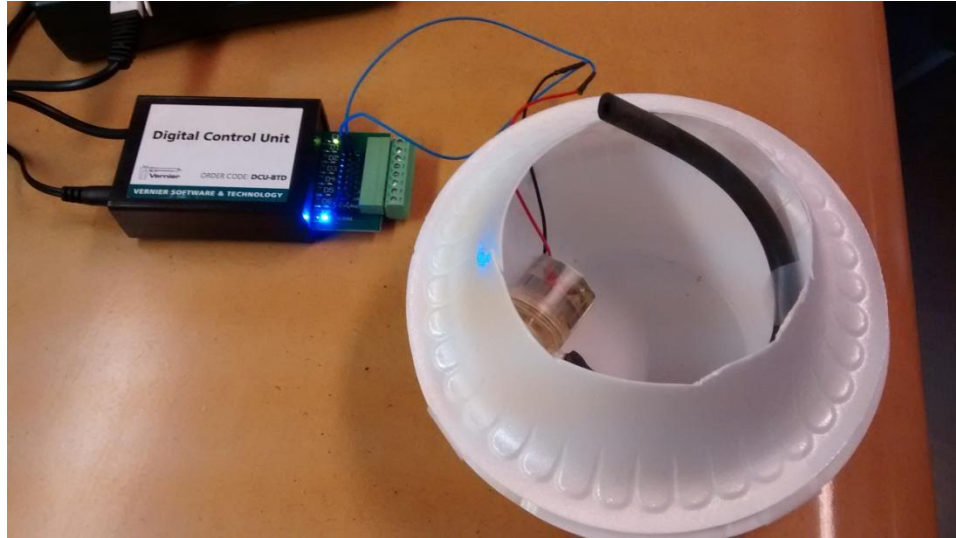


# Engineering Design Sheet

Project Code Name: <i>Project Water Boy</i>	Team Members: <i>Sam, Josh, Tom</i>
<b>Design Objective</b>	<i>We need to detect the position and motion of a person and activate a water pump if they are close and want a drink.</i>
<b>Design Requirements and Constraints</b>	<p><i>Our device should...</i></p> <ul style="list-style-type: none"> <li><i>• Run continuously</i></li> <li><i>• Pump water when someone is close (less than 50 cm)</i></li> <li><i>• Differentiate between people who are just passing by and those that actually want a drink, i.e. is stopped (velocity is zero)</i></li> </ul>
<b>Process Map</b> (Work Flow Diagram)	<pre> graph LR     Start([Start]) --&gt; Measure[Measure distance and velocity]     Measure --&gt; Dist{Is distance less than 0.5 m?}     Dist -- No --&gt; Measure     Dist -- Yes --&gt; Vel{Is velocity less than 0.1 m/s?}     Vel -- No --&gt; Measure     Vel -- Yes --&gt; Pump[Turn on pump]     Pump --&gt; Measure     </pre>
<b>Ideas and Sketches</b>	<p><i>Prototype - Pump immersed in water in a bowl, tubing connected to pump output to make fountain, water just recycles back into bowl</i></p> <p><i>Pump on DCU line 1, turns on when person is close (&lt;50 cm) and stopped (velocity = 0)</i></p> <p><i>Green light to show when water is on?</i></p>
<b>Test Log</b> (Include what did not work and how you changed it)	<ul style="list-style-type: none"> <li><i>• Triggering the fountain only when the velocity was zero didn't work very well - it is hardly ever zero. So, we changed the condition to "when velocity is less than 0.1 m/s."</i></li> <li><i>• Decided against green light, as it was basically unnecessary</i></li> <li><i>• Logger Pro data collection was set to "Repeat" so that the program will run continuously.</i></li> </ul>
<b>Final Design</b> (Include screenshot of Logger Pro Digital)	<i>See pictures below</i>

Out dialog box and pictures, as necessary)	
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*Hardware Set Up:*

- *DCU Line 1 - Pump*
- *Pair of Styrofoam bowls to hold water and direct tubing*

Digital Out

Test DCU

☐ Line 1 On    ☐ Line 2 On    ☐ Line 3 On

Configure Activation

☒ Activate Line 1

If  Is   m

AND  Is   m/s

☐ Activate Line 2

If  Is   m

Is   m

☐ Activate Line 3

If  Is   m

Is   m

☐ Start activation when dialog is closed

☒ Start activation when experiment run is started (Collect button clicked)

Help    OK    Cancel

*Logger Pro Digital Out dialog box*