Hardware Report

2-6-15

Possible Hardware solutions with some notes.

* Micro Controllers
  + Pic
    - inexpensive
    - I am comfortable with them
  + MSP430
    - Low power
    - Very little experience using them
  + Arduino
    - Inexpensive
    - Easily expandable
  + Raspberry PI
    - Inexpensive (I already own one)
    - Web capable
  + 8051
    - Very comfortable using
    - Will require additional hardware
  + Others
* Moisture Sensors
  + Resistive
    - Simple dual probe, measure resistance in the ground.
    - Water will reduce the resistance
    - corrosion and plating can occur
    - not very accurate due to different salt contents of the ground and water…
    - works well for testing if there is any water, not really levels.
  + Capacitive
    - Simple single probe can be used. Similar to resitive
    - Measures the capacitance in the ground.
    - Resists corrosion.
    - More accurate then resistive.
    - Has ability to test for levels of moisture
    - Good for local areas, not very good for large masses of water
  + Time Domain Transmission
    - Sends a ping and based on the water and other elements in the ground the time for response tells you approximately how much water there is in the ground.
    - Used to find in larger areas, not really localized.
  + Heat Dissipation
    - Similar to above. Used in larger areas
  + neutron moisture gauges
    - Costly, used in larger areas as well.

Picked Hardware

* Raspberry Pi
  + Mainly internet capabilities
  + Rapid development
  + Perfect for proof of concepts
  + May not be ideal for end product.
  + I already own one also.
* Capacitive Sensor
  + Resistive to corrosion and fairly accurate for localize moisture sensing.
  + https://www.tindie.com/products/miceuz/i2c-soil-moisture-sensor/