It appears for sensor functionality we will need to use the Arduino because of the two analog sensors. I think the Pi requires a separate analog-to-digital converter (not on-board). I have an Arduino and a Pi. Can we use the Pi for network COMs? I’ll just need to know what you use as the interface. I could also use a separate Arduino for all local functions- sensor data to LCD if it turns out the LCD requires the same interface as the Pi, if you know what I mean. If you need to split the program into parts and operate on separate MCUs, I can accommodate. We should have most of these pieces from ICPs. Just let me know your strategy. In the end if things look to get complicated, just simplify and I will modify the build. We don’t need to kill ourselves with this thing. We’ll do what we can over the next several days and tie it all up Wednesday. No new features after that. We go with what we’ve got and I’ll use Thursday to put together the presentation.

Sensors

Temperature / Humidity: digital I/O (from ICP)

Light: analog (from ICP)

UV: digital (from ICP)

Soil Moisture: analog (<https://wiki.dfrobot.com/Capacitive_Soil_Moisture_Sensor_SKU_SEN0193>)

Hardware

LCD: serial COM (I actually purchased a serial-to-parallel module like we used in class and have an LCD dispay)

Grow Light: digital I/O, HIGH for ON and LOW for OFF

Water Pump: digital I/O, HIGH for ON and LOW for OFF

Ventilation Fan: digital I/O, HIGH for ON and LOW for OFF

Interface

Raspberry Pi: handles communications

Website: Node-Red dashboard

Twitter: receives messages from Node-Red

Mobile App: displays data and possibly exceedance messages, can turn on fan and light- whatever)

Arduino: hosts sensors and controls LCD

Functionality

Data is read from the sensors.

**LCD:** displays temp/humidity and soil moisture (i.e. “Soil is Dry”, “Soil is Moist”, “Soil is Very Wet” from the sensor logic described in the attached code). It could also post the messages described below if we are looking to flesh out the project a little more.

**LIGHT:** The light is normally on. The light sensor confirms. A message is sent if the light is “ON”, but the sensor does not confirm.

**WATER PUMP:** The moisture sensor code (<https://wiki.dfrobot.com/Capacitive_Soil_Moisture_Sensor_SKU_SEN0193>) categorizes data into three ranges: Dry, Moist, and Very Wet. When the sensor is Dry, the water pump is activated until the sensor is Moist. If the sensor is Very Wet a message is sent.

**FAN:** If the temperature exceeds 85F, the fan comes on until the temperature is 80F. (Optional: if the temperature exceeds 85F with the fan ON for 5 minutes, the light is turned OFF, an “EXCESSIVE HEAT” message is sent periodically until the temperature is 75F) If the humidity exceeds 60%, the fan comes on until the humidity is 50%.