Arduino Weather Station Part 1

We will be building a weather station that can measure temperature, barometric pressure, humidity, UV light level, light level, and soil moisture level. The weather station will also have a RTC to keep track of the time accurately even in the event of a power failure.

It will be in two parts, in the first iteration we will just have an arduino uno connected to the sensors, and then we will use a raspberry pi as a console that will retrieve the readings over a wireless connection and log the readings in a text file, and then we can expand it to display it on a web page and/or a display connected to the raspberry pi. We will also be able to set the time on the weather station remote, change units from metric to english, and monitor the connection between the Pi and the arduino remote. We will also be discussing various ways to power the remote station and how to make an enclosure for it.

First we will connect up the temperature and humidity sensor (they are in the same unit) and write the code that will read the data from it.

We will be using a DHT22 module to read the temperature and humidity. The sensor requires three connections, ground, Vcc and a data connection. When looking at the front of the sensor (with the waffle grid pattern) the pins are as follows from left to right:

1 - Vcc
2 - Data
3 - No connection
4 - GND

Connect the Vcc and GND to the connections on the breadboard (it can be 5v) and then connect the data pin on the sensor to digital pin 2 on the Arduino.

Load the sketch FARCWeatherStation1 which has the code to load the libraries for the DHT module and the methods and variables to hold and retrieve the temperature and barometric pressure.

There are two defined flags which determine how the code runs. If you have them both commented out then nothing will be output to the serial console. Uncommenting ‘DEBUG’ will display just the output of the sensors, ‘DEBUG RAW’ will output the sensor data and include the variables for the timing of the refresh.