

Technical Design

for the

Weather Station Project

Version

Technical Design for

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| --- |
| Referenced Documents |

|  |  |
| --- | --- |
| Document Name and Location | Description |
| [www.adafruit.com](http://www.adafruit.com) | Spec sheets and info on sensors |

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| --- | --- | --- | --- |
| Version | Date | User | Description |
| 1.0 | 8/27/2013 | Greg | Initial document creation |
| 1.1 |  |  |  |
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# Overview

The purpose of this project is to build a weather station, using the Raspberry Pi microcomputer. The weather station will be capable of measuring temperature, barometric pressure, and rain fall amounts.

The overall goal of this project is to capture and log this data, via an SQL database. Once recorded, the data can be made available to the public via a web page, Twitter, and shared with Weather Underground ([www.wunderground.com](http://www.wunderground.com)).

The weather station will be designed in a modular format, using standard telephone connectors and wire. Using this approach will enable sensors to be added and removed at any time.

# Hardware/Software Requirements

## Hardware

|  |  |  |
| --- | --- | --- |
| **Part** | **Vendor** | **Cost** |
| Raspberry Pi | [www.adafruit.com](http://www.adafruit.com) | $35.00 |
| DHT22 | [www.adafruit.com](http://www.adafruit.com) |  |
| BMP085 | [www.adafruit.com](http://www.adafruit.com) |  |
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## Software

# Temperature and Humidity

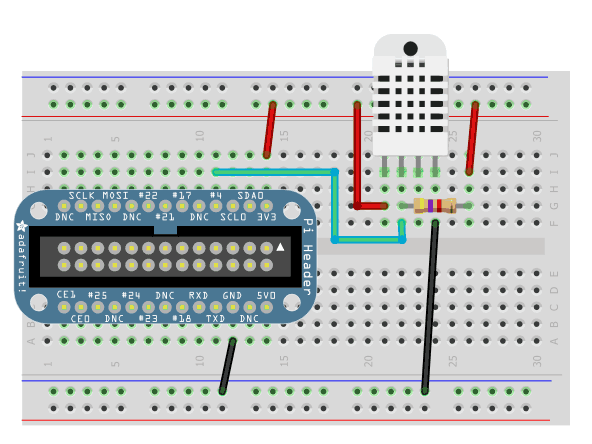
## Overview

The weather station will use the DHT22 sensor for capturing temperature and humidity data. The DHT22 is a basic, low-cost digital sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and outputs a signal on the digital data pin.

## Wiring

The left most pin of the DHT22 will connect to 3v3 (RPi pin 2). The right most pin will connect to ground (RPi pin 5). The inner left pin will be connected to GPIO #4 (RPi pin 8). The inner right pin is unused.

A 4.7k ohm resistor is also connected between the output pin and Vcc . This resistor is referred to a a pull-up resistor. A pull-up resistor is used when connecting the output pin of a sensor to the input of a microcontroller (in this case the Raspberry Pi). The resistor is used to prevent a phenomena referred to as floating, which occurs when the microcontroller reads the state of the sensor pin and that state is neither high or low.

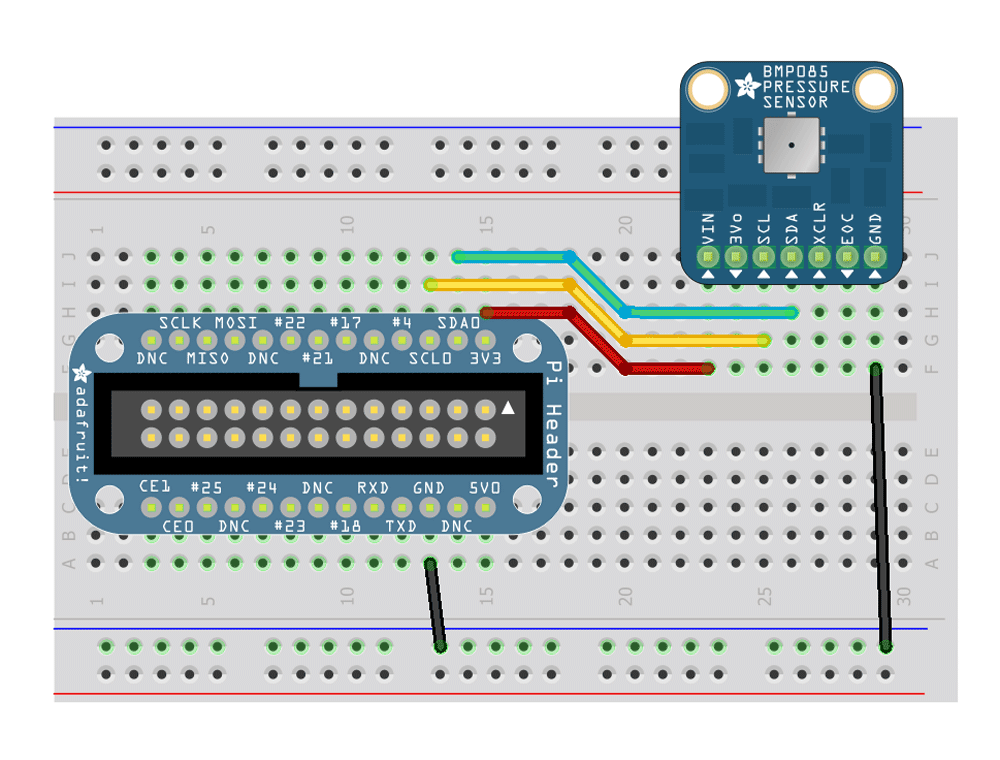


## Software

# Barometric Pressure

## Overview

## Wiring



## Software

# Rain Sensor

## Overview

## Wiring

## Software

# Rain Measurement

## Overview

## Wiring

## Software

# Wind Speed

## Overview

## Wiring

## Software

# Database

## Temperature

## Humidity

## Barometric Pressure

## Rainfall

# Web Service

# Web Site

# Weather Station Enclosure