HUMBER

Project Documentation

Temperature, Dew Point & Humidity Reader

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1. Introduction

This Project was based on the Environmental Monitoring with Arduino Project book. The main goal of my project was to transform this basic project into a unique one by adding special features like:

- Multicolor display – dependent on temperature value
- Network access and functionality
- Database access and Storage
- Possible remote Multicolor value setting

The book recommended the following Parts:

- Arduino (Uno)
- Ethernet Shield
- Breadboard
- DHT-22 Sensor
- 4char display
- 4.7k Resistor
- Jumper wires.

There were a couple of changes made in regards to my project and in comparison to that of the book.

1.1 Final State of Project

The project was completed successfully, with possibilities and considerations of adding other special features such as:

- Extension of DHT-22 sensor away from the circuitry
- Remote management of the device
- Implementation into temperature monitoring and control environments
- Update to Sparkfun Xbee

2. PROJECT FUNCTION

The project focuses majorly on providing weather information, primarily temperature, dew point and humidity readings. The readings are set to a specific temperature (below 23.C) for blue lcd color, between (23 and 26) for green lcd color and (26) and above for red lcd color. This lcd display feature was added to enhance the users attention to the color schemes in order to have an idea what the temperature range is at a given time.

3. DATABASE PURPOSE

The temperature, dew point and humidity values are updated to the database every minute. This database could be used to access the given temperature at a given time and date. This feature broadens the use of this device into many scopes.

4. GRAPHICAL USER INTERFACE PURPOSE

The application that displays the database was designed partly inplace of a web app which gives the user more control of reading what king of data they want from the database.

5. BUILDING THE CIRCUIT

1. Breadboard railing should be powered up

2. Connect a red jumper wire from the 3.3v pin on the Arduino to the voltage (red) rail on the breadboard, and a black jumper from the GND pin to the ground (black) rail on the breadboard.

3. Connect a short red jumper from the voltage rail to the voltage (leftmost) pin of the DHT-22 temperature and humidity sensor.

4. Connect a short black jumper from the GND rail to the GND (rightmost) pin of the DHT-22.

5. Connect a green jumper from the DATA (second from the left) pin on the sensor to digital pin 4 on the Arduino.

6. Add a 4.7K resistor between the DATA pin of the sensor and the VOLTAGE pin.

7. Connect a green jumper from Arduino pin 3 to the RX (rightmost) pin of the four-character display, and a black jumper from the GND rail to the GND (leftmost) pin of the four-character display.

8. Use the given code in the GitHub directory if you decide to use a 16*2 lcd display.

6. MISCILLENIOUS

Below is the PCB schematic and breadboard for Eagle Cad in order to create a PCB circuit for the device.
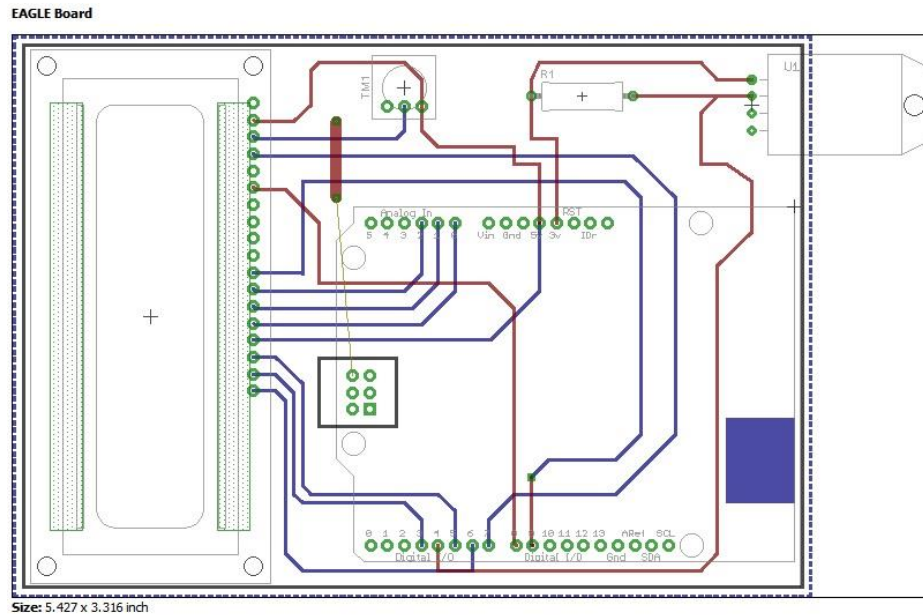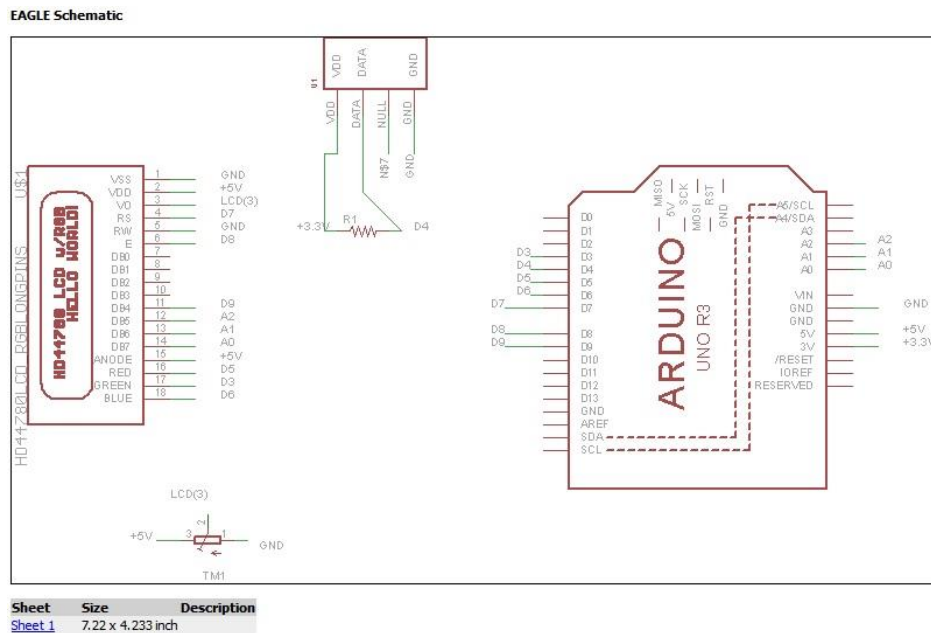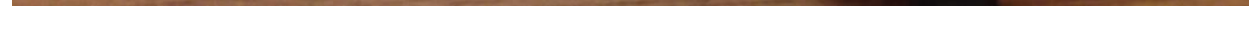
EAGLE Board

Size: 5.427 x 3.316 inch

Figure 1. PCB Breadboard

EAGLE Schematic

Sheet	Size	Description
Sheet 1	7.22 x 4.233 inch	

Fig 2. PCB Schematic

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Fritzing Breadboard layout

Fig3. Fritzing breadboard

COMPLETED BREADBOARD CIRCUITRY

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COMPLETED PCB DEVICE