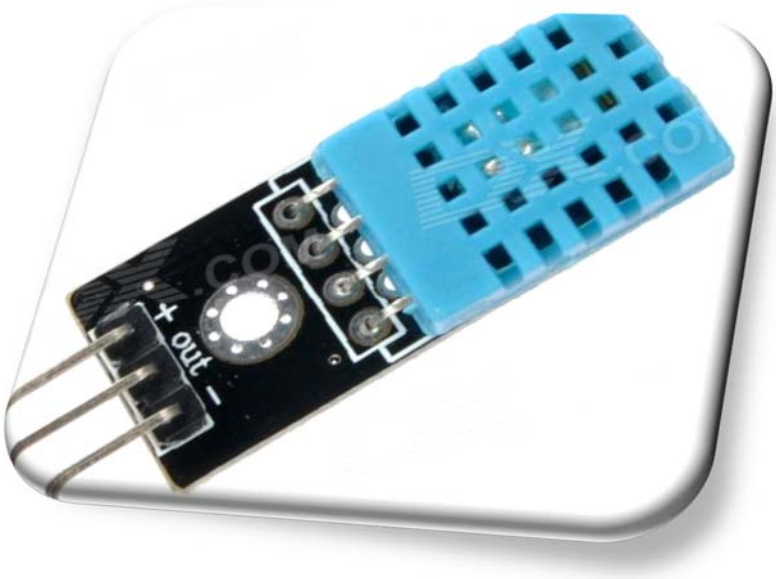
CNARDUINO

DHT11 Temperature and Humidity Sensor

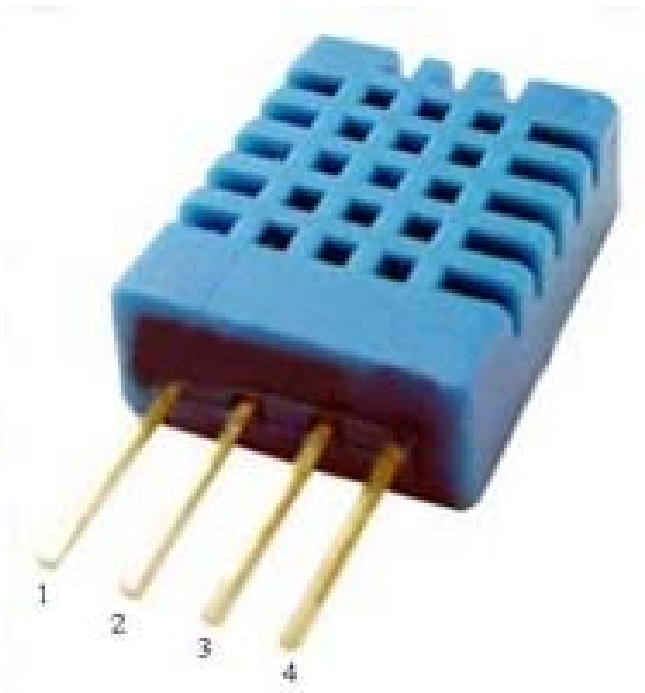


COMPANY: CNARDUINO-SHENZEN

DHT11 TEMPERATURE & HUMIDITY SENSOR

7.01 OVERVIEW

The DHT11 is chosen because it is lab calibrated, accurate and stable and its signal output is digital. Most important of all, it is relatively inexpensive for the given performance. Below is the pinout of the sensor. This DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. By using the exclusive digital-signal-acquisition technique and temperature & humidity sensing technology, it ensures high reliability and excellent long-term stability. This sensor includes a resistive-type humidity measurement component and an NTC temperature measurement component, and connects to a high-performance 8-bit microcontroller, offering excellent quality, fast response, anti-interference ability and cost-effectiveness.



DATASHEET

The datasheet for the DHT11 temperature and humidity sensor can be downloaded from here.

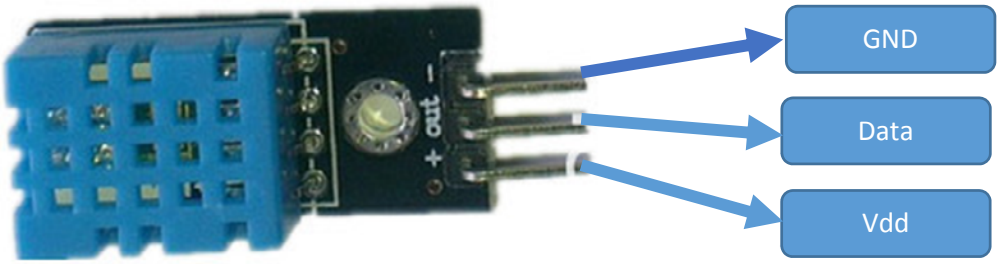
POWER AND PINOUT

DHT11's power supply is 3-5.5V DC. When power is supplied to the sensor, do not send any instruction to the sensor in within one second in order to pass the unstable status. One capacitor valued 100nF can be added between VDD and GND for power filtering.

The actual sensor has four pins whose details are given below:

Pin No.	Name	Description
1	Vdd	Power Supply 3V-5.5V
2	Data	Serial Data Output
3	NC	Not Connected
4	GND	Ground

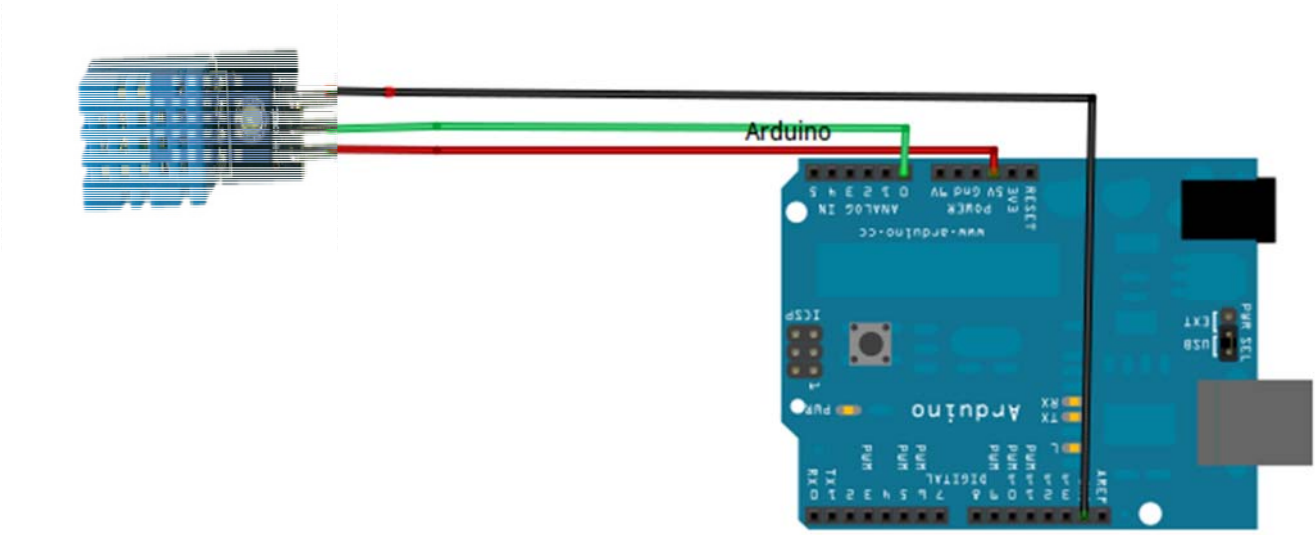
But the module has only three pins, so the third pin which is not connected has not been used, so the details are as below:



7.02 WIRING/ CONNECTIONS

For wiring the DHT11 to arduino UNO use the following scheme:

S. No.	Arduino Pin No.	DHT11 Pin No.
1.	Vcc	Pin 1(Vdd)
2.	Analog0	Pin 2(Data)
3.	GND	Pin 3(GND)



INSTALL THE DHT11 LIBRARY

Down load this zipped file and unzip it under the libraries directory of the Arduino IDE folder. For example, for my computer's setup, the directory is

C:\arduino-1.0.1\libraries

After copying files across, the directory

C:\arduino-1.0.1\libraries\DHT

You should have the following two files: dht.h and dht.cpp

7.03 CODE/ PROGRAM

Load the program and upload it to the arduino UNO.

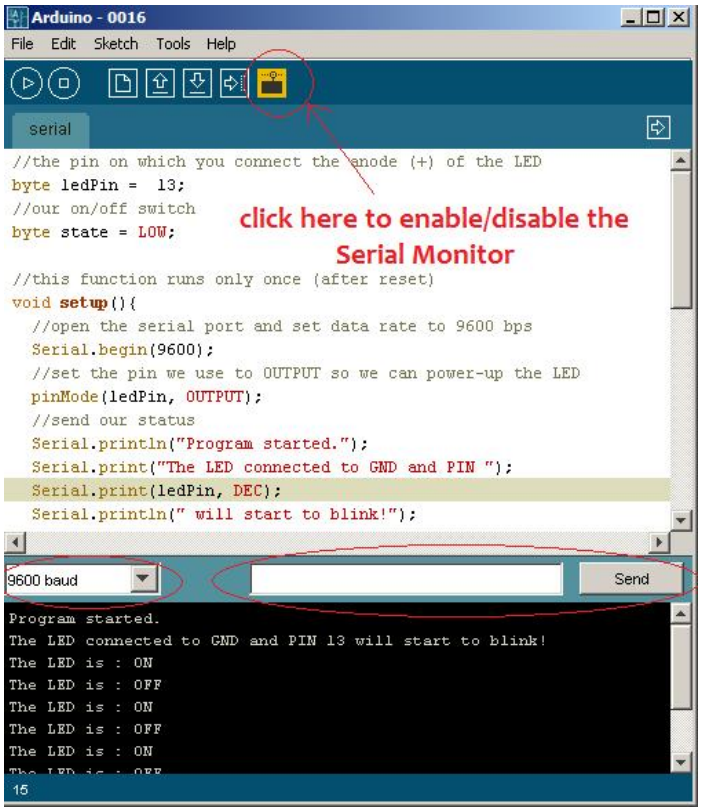
```
#include <dht.h>

#define dht_dpin A0 //no ; here. Set equal to channel sensor is on

dht DHT;

void setup(){
  Serial.begin(9600);
  delay(300);//Let system settle
  Serial.println("Humidity and temperature\n\n");
  delay(700);//Wait rest of 1000ms recommended delay before
  //accessing sensor
}//end "setup()"

void loop(){
  //This is the "heart" of the program.
  DHT.read11(dht_dpin);
```

```
    Serial.print("Current humidity = ");
    Serial.print(DHT.humidity);
    Serial.print("%  ");
    Serial.print("temperature = ");
    Serial.print(DHT.temperature);
    Serial.println("C  ");
  delay(800);//Don't try to access too frequently... in theory
  //should be once per two seconds, fastest,
  //but seems to work after 0.8 second.
}// end loop()
```

Arduino IDE

RUNNING THE PROGRAM

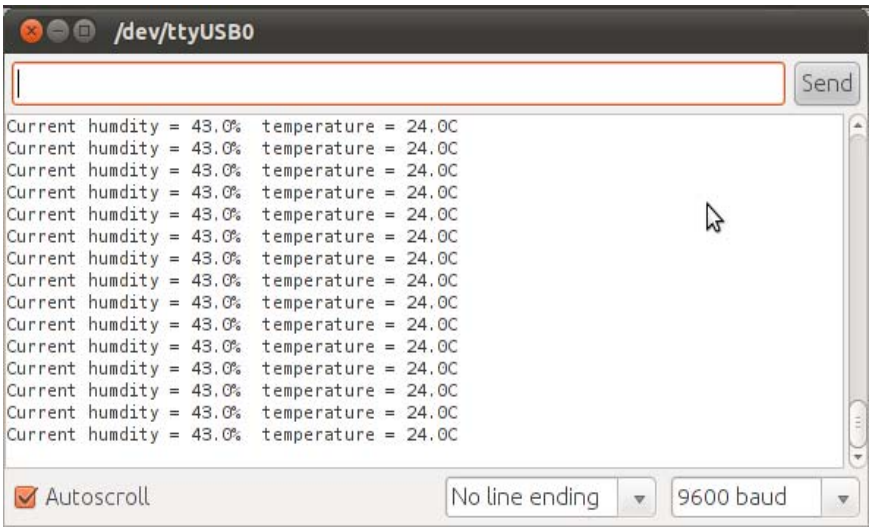
- Compile the program in the IDE
- Run the program and open the Serial port (shown below)



How to see the Serial port output

OUTPUT OF THE PROGRAM

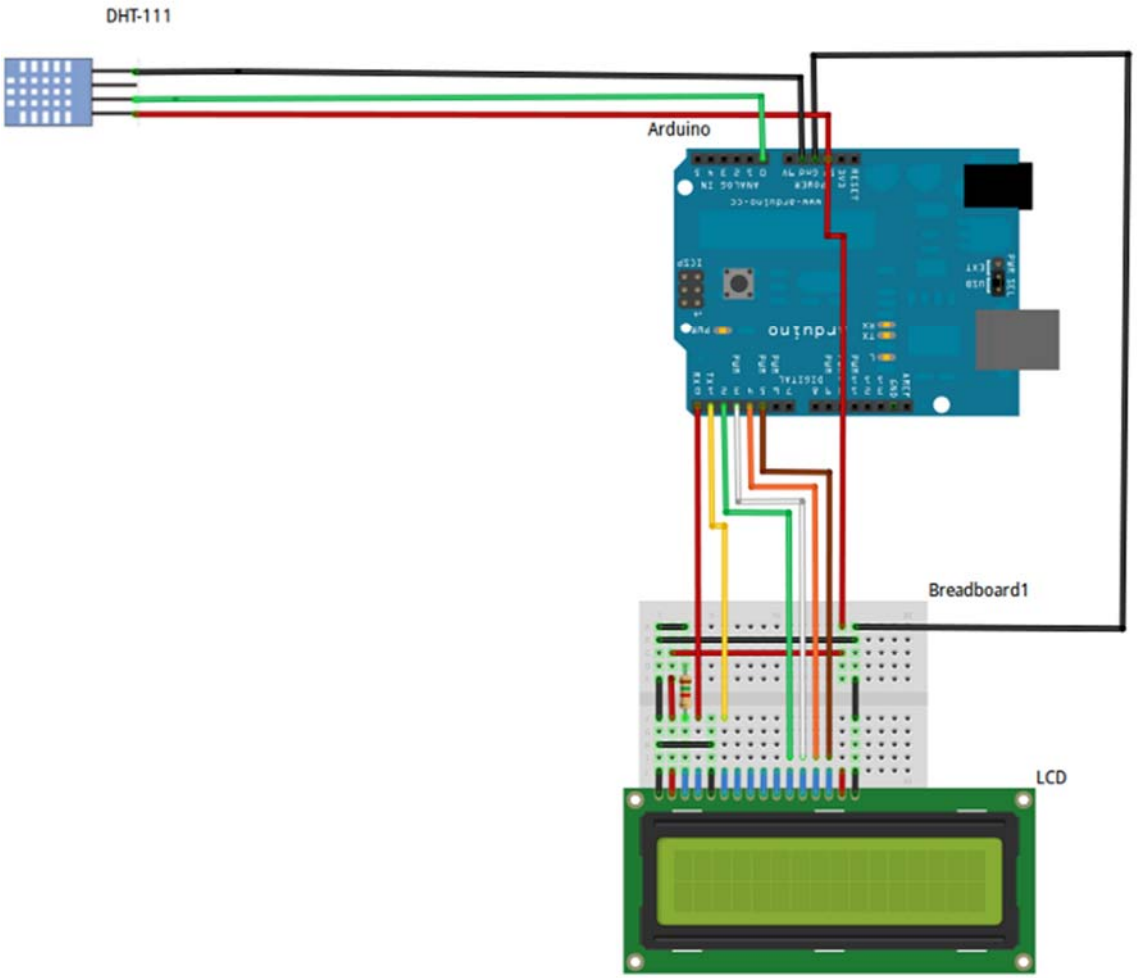
And you should see the temperature and Humidity readings



7.04 BOOTING UP THE WEATHER STATION

WIRING THE ARDUINO + LCD + DHT11

First of all, you will need to wire the DHT11 sensor and the LCD as shown in the circuit diagram below:



Circuit to wire up the Arduino the LCD and the DHT11 sensor

CODE

Loading the program to get the weather station going:

```
#include <dht.h>
#define dht_dpin A0 //no ; here. Set equal to channel sensor is on
#define LIGHT_SENSOR_PIN 1
// include the library code:
#include <LiquidCrystal.h>

dht DHT;
// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(0, 1, 2, 3, 4, 5);

byte bGlobalErr; //for passing error code back from complex functions.
```

```
byte dht_dat[4]; //Array to hold the bytes sent from sensor.
int light_intensity = 0;
unsigned int flip = 0;

void setup(){
     //Blink LED to detect hangs
     pinMode(13, OUTPUT);
     // set up the LCD's number of columns and rows:
     lcd.begin(16, 2);
     lcd.print("Hello world!");
     //Serial.begin(9600);
     delay(300); //Let system settle
     //Serial.println("Humidity and temperature\n\n");
     delay(700); //Wait rest of 1000ms recommended delay before
     //accessing sensor
} //end "setup()"

void loop(){

     // set the cursor to column 0, line 1
     // (note: line 1 is the second row, since counting begins with 0):
     //lcd.setCursor(0, 1);
     // print the number of seconds since reset:
     //lcd.print("100");
     //lcd.print(millis()/1000);
     if ( flip & 1 )
     {
          digitalWrite(13, HIGH);
     } else {
          digitalWrite(13, LOW);
     }

     flip++;

     light_intensity=analogRead(LIGHT_SENSOR_PIN);

     DHT.read11(dht_dpin); //This is the "heart" of the program.

          lcd.setCursor(0, 0);

          lcd.print("temp =       ");
          lcd.setCursor(7, 0);
          lcd.print( DHT.temperature);

          lcd.setCursor(0, 1);
          //Every 7 out of 15 times we show humidity, rest temp
          if ((flip % 15) > 7 )
          {
               lcd.print("humidity = ");
               lcd.setCursor(11, 1);
               lcd.print(DHT.humidity);
          } else {
               lcd.print("Light =         ");
               lcd.setCursor(8, 1);
               lcd.print( light_intensity, DEC);
          }

     delay(800); //Don't try to access too frequently... in theory
     //should be once per two seconds, fastest,
     //but seems to work after 0.8 second.

} // end loop()
```

Once the code is loaded the Weather Station should be reading the Temperature and Humidity reading and displaying it on the cool blue backlight screen!!!

7.05 ONLINE STORE LINK TO BUY

- http://www.aliexpress.com/store/product/Free-shipping-DHT11-Temperature-Sensor-Module-Humidity-transducer-with-Dupont-Line-for-Arduino/1036551_1520568039.html