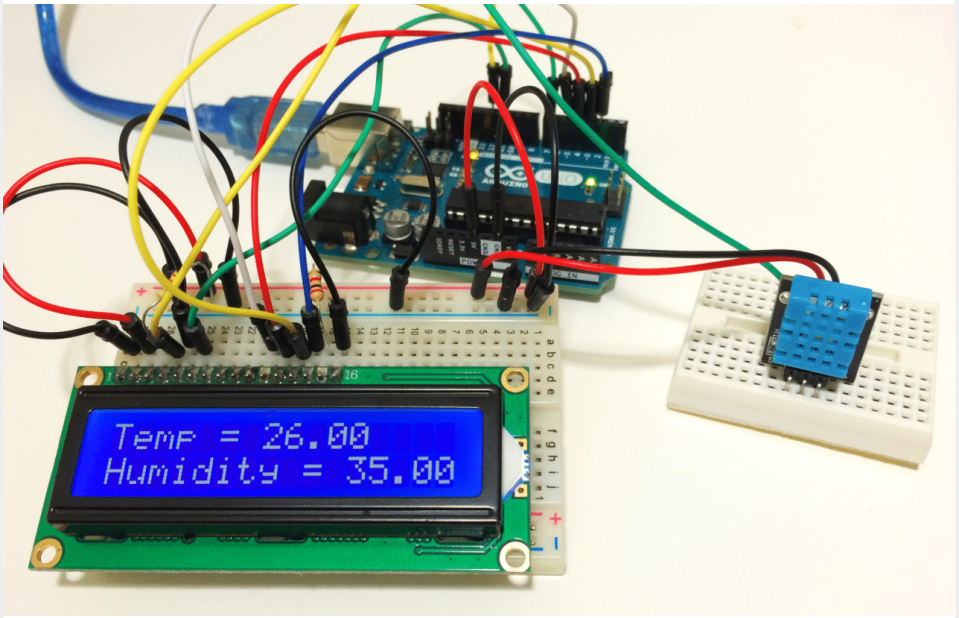
HOW TO SET UP THE DHT11 HUMIDITY SENSOR ON AN ARDUINO

Posted by Circuit Basics | Arduino | 162



The DHT11 humidity and temperature sensor makes it really easy to add humidity and temperature data to your DIY electronics projects. It's perfect for remote weather stations, home environmental control systems, and farm or garden monitoring systems.

In this tutorial, I'll first go into a little background about humidity, then I'll explain how the DHT11 measures humidity. After that, I'll show you how to connect the DHT11 to an Arduino and give you some example code so you can use the DHT11 in your own projects.

BONUS: I made a quick start guide for this tutorial that you can download and go back to later if you can't set this up right now. It covers all of the steps, diagrams, and code you need to get started.

Here are the ranges and accuracy of the DHT11:

- Humidity Accuracy: ±5% RH
- Temperature Range: 0-50 ˚C
- Temperature Accuracy: ±2% ˚C
- Operating Voltage: 3V to 5.5V

The DHT11 Datasheet:

DHT11 Datasheet

WHAT IS RELATIVE HUMIDITY?

The DHT11 measures *relative humidity*. Relative humidity is the amount of water vapor in air vs. the saturation point of water vapor in air. At the saturation point, water vapor starts to condense and accumulate on surfaces forming dew.

The saturation point changes with air temperature. Cold air can hold less water vapor before it becomes saturated, and hot air can hold more water vapor before it becomes saturated.

The formula to calculate relative humidity is:

$$RH = (\frac{\rho_w}{\rho_s})\ x\ 100\%$$

$$RH: \ Relative\ Humidity$$
$$\rho_w: \ Density\ of\ water\ vapor$$
$$\rho_s: \ Density\ of\ water\ vapor\ at\ saturation$$

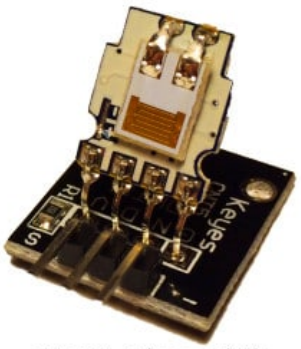
Relative humidity is expressed as a percentage. At 100% RH, condensation occurs, and at 0% RH, the air is completely dry.

HOW THE DHT11 MEASURES HUMIDITY AND TEMPERATURE

The DHT11 detects water vapor by measuring the electrical resistance between two electrodes. The humidity sensing component is a moisture holding substrate with electrodes applied to the surface. When water vapor is absorbed by the substrate, ions are released by the substrate which increases the conductivity between the electrodes. The change in resistance between the two electrodes is proportional to the relative humidity. Higher relative humidity decreases the resistance between the electrodes, while lower relative humidity increases the resistance between the electrodes.

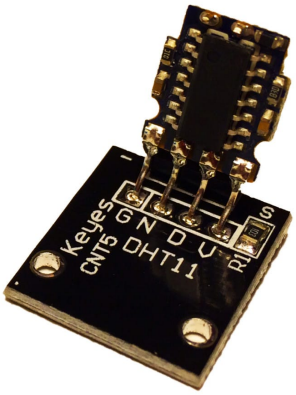
The DHT11 measures temperature with a surface mounted NTC temperature sensor (thermistor) built into the unit. To learn more about how thermistors work and how to use them on the Arduino, check out our Arduino Thermistor Temperature Sensor Tutorial.

With the plastic housing removed, you can see the electrodes applied to the substrate:



Front view with cover removed

An IC mounted on the back of the unit converts the resistance measurement to relative humidity. It also stores the calibration coefficients, and controls the data signal transmission between the DHT11 and the Arduino:



Rear view with cover removed

The DHT11 uses just one signal wire to transmit data to the Arduino. Power comes from separate 5V and ground wires. A 10K Ohm pull-up resistor is needed between the signal line and 5V line to make sure the signal level stays high by default (see the datasheet for more info).

There are two different versions of the DHT11 you might come across. One type has four pins, and the other type has three pins and is mounted to a small PCB. The PCB mounted version is nice because it includes a surface mounted 10K Ohm pull up resistor for the signal line. Here are the pin outs for both versions:

HOW TO SET UP THE DHT11 ON AN ARDUINO

Wiring the DHT11 to the Arduino is really easy, but the connections are different depending on which type you have.

CONNECTING A THREE PIN DHT11:

CONNECTING A FOUR PIN DHT11:

- R1: 10K Ohm pull up resistor

DISPLAY HUMIDITY AND TEMPERATURE ON THE SERIAL MONITOR

Before you can use the DHT11 on the Arduino, you'll need to install the DHTLib library. It has all the functions needed to get the humidity and temperature readings from the sensor. It's easy to install, just download the DHTLib.zip file below and open up the Arduino IDE. Then go to Sketch>Include Library>Add .ZIP Library and select the DHTLib.zip file.

DHTLib

After it's installed, upload this example program to the Arduino and open the serial monitor:

```
1  #include <dht.h>
2
3  dht DHT;
4
5  #define DHT11_PIN 7
6
7  void setup(){
8    Serial.begin(9600);
9  }
10
```

You should see the humidity and temperature readings displayed at one second intervals.

If you don't want to use pin 7 for the data signal, you can change the pin number in line 5 where it says `#define DHT11_PIN 7`.

DISPLAY HUMIDITY AND TEMPERATURE ON AN LCD

A nice way to display the humidity and temperature readings is on a 16X2 LCD. To do this, first follow our tutorial on How to Set Up an LCD Display on an Arduino, then upload this code to the Arduino:

```
#include <dht.h>
#include <LiquidCrystal.h>

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

dht DHT;

#define DHT11_PIN 7

void setup(){
```

USING THE DATA IN OTHER PROGRAMS

What if you don't want to output the actual humidity and temperature readings, but need them to calculate or control other things? The code below is the bare minimum needed to initialize the sensor. You can add this to existing programs and use `DHT.humidity` and `DHT.temperature` as variables in any function.

```
#include <dht.h>

dht DHT;

#define DHT11_PIN 7

void setup(){
}

void loop()
```

To see an example of using the DHT11 sensor outputs as variables in other functions, check out our article How to Set Up an Ultrasonic Range Finder on an Arduino, where we use the `DHT.humidity` and `DHT.temperature` variables in a formula that improves the accuracy of an ultrasonic range finder.

You can watch how to set up the DHT11 and see how it works in this video:

If you have any questions about how to set up the DHT11 humidity and temperature sensor on your Arduino, just leave a comment below and I

will try to answer it... And if you like our tutorials, please subscribe! Also, feel free to share this if you know anyone else that might find it helpful!

Recommended Electronics Engineering Websites:

EasyEDA: Free PCB Design Software. Start to design your own PCB circuit easily.

JLCPCB Prototype: Only $2 for 10pcs 10×10cm PCBs, 2-3 days delivery.

LCSC Parts: Save 50% on cost, wide selection in-stock, same day shipping.

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ABOUT THE AUTHOR

Circuit Basics

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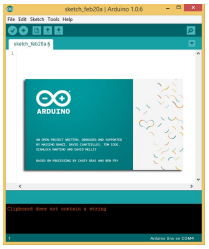

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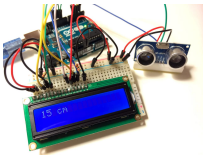

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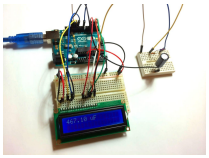

How to Make an Arduino Capacitance Meter

162 COMMENTS

1.

snowbird on October 1, 2015 at 7:26 pm

Thank you

REPLY

Peter on January 21, 2016 at 9:14 am

Hi.
It is discussed on the net you get different measurement results from DHT11.
The factory calibration are stored on the chip.
Can you make a recalibration?
Do you know hove to do it?
Regards.
Peter

REPLY

Circuit Basics on August 1, 2016 at 3:53 pm

Hi Peter, I haven't tried re calibrating the factory values, but the datasheet has instructions on how to do it

REPLY

m_shoaib19@yahoo.com on October 28, 2016 at 7:40 pm

how to connect dht11 sensor with raspberry pi 3????

REPLY

Circuit Basics on February 27, 2017 at 9:24 am

We have a tutorial on that too:
http://www.circuitbasics.com/how-to-set-up-the-dht11-humidity-sensor-on-the-raspberry-pi/

REPLY

mueed on September 21, 2016 at 7:52 am

my display does not work. only back light is on

REPLY

Lodovico Guicciardini on October 11, 2016 at 9:59 am

Mueed, do you have more information?
Do you have an I2C connected for instance?

REPLY

kevin f cunningham on August 7, 2017 at 6:39 pm

I have the dht11 reading and printing to lcd and serial monitor.I have the dht11 controlling two relays one for temp and one for humidity.When the relay turns on the dht11 stops sending readings and freezes and stops reading? Any way I can fix that ?thanks

REPLY

Dale Bridgford on August 8, 2017 at 1:43 am

Hi Kevin,

When the DHT11 triggers, do you have your code setting a different pin HI?

REPLY

luc.taesch on August 19, 2017 at 5:06 pm

thank you

REPLY

2.

bhanu on November 9, 2015 at 1:08 pm

Temperature sensor i have connected b y seeing the circuit diagram

what is the output of temperature sensor? and how to capture output of sensor?

REPLY

Circuit Basics on November 19, 2015 at 1:00 am

The output is to the serial monitor, unless you have connected an LCD. The video will show you how to open the serial monitor if you don't already know how to.

REPLY

3.

jose miguel on November 30, 2015 at 12:20 am

I love this so much!! THANK YOU!!!
A quick question tho, do you have a tutorial on how to connect this to a wireless transceiver?? also in theory could i connect more then one humidity detector to an arduino in order to detect humidity from more then one spot?
Thank you again and i've subscribed!

REPLY

Circuit Basics on August 1, 2016 at 3:57 pm

Hi Jose, you can definitely connect more than one sensor to a single Arduino. You would basically duplicate the code, and have a separate pins read the data from each sensor. As for connecting them to a wireless tranceiver, I'm sure it's possible, but you would probably need to use another microcontroller as a hub to transmit the data. I haven't tried it yet though, so don't take my word for it!

REPLY

4.

Cade on December 22, 2015 at 7:15 pm

Is there a way to change it from Celsius to Fahrenheit

REPLY

mstashiro on January 27, 2016 at 10:52 pm

The DHT.h library will do it for you. float f = dht.readTemperature(true);

Look at the example sketch also.

REPLY

bebop on April 29, 2016 at 10:54 pm

int tempF = DHT.temperature * 9 / 5 + 32;
// you then println tempF instead of DHT.temperature

REPLY

5.

JOjO on December 29, 2015 at 4:34 am

To convert from celsius to fahrenheit use the formula below.

T(˚F) = T(˚C) × 9/5 + 32
or
T(˚F) = T(˚C) × 1.8 + 32

REPLY

6.

JOjO on December 29, 2015 at 4:35 am

Also here is the code if this would be easier.

int celtemp = DHT.temperature;
int fartemp = (celtemp*1.8)+32;
Serial.println(fartemp);

REPLY

Scott Henrichs on January 12, 2017 at 11:02 pm

where do you put these lines I just copied the example for the temp sensor with lcd display

REPLY

7.

Marc Remmerie on January 6, 2016 at 4:22 am

Hello, I built my first arduino project (measuring the room temperature and humidity with the DHT11) during Christmas holidays. The readings of the values were shown on the screen of my laptop. The measured room temperature was correct, but the measured humidity was much too low (about 20%RH). What can be the reason for ithe low humidity? And how can the sensor (if needed) be recalibrated?
Looking forward to your answer.
Thanks in advance.

REPLY

Dale Bridgford on January 10, 2016 at 11:54 pm

Based on my AprilAire Humidfier's adjustment knob, the linear equation for the humidfier is

"HumidGoal = 0.5*(outside T(˚F)) + 25" (using Excel's ability to provide an equation on a graph)

So if it is -20˚F, it is probably acceptable. Household humidity drops in the winter as your furnace runs.

REPLY

8.

roksho on January 21, 2016 at 6:53 am

Big thamks for uploading the video. it was really useful.how can i get program to interface different sensors on arudino and display sensor values??

REPLY

Circuit Basics on August 1, 2016 at 3:59 pm

I haven't tried connecting multiple sensors, but it should be fairly easy. You would just duplicate the code and use a separate pin to read the data for each sensor

REPLY

9.

Peter on January 22, 2016 at 10:05 am

Hi.
It is discussed on the net you get different measurement results from DHT11.
The factory calibration are stored on the chip.
Can you make a recalibration?
Do you know hove to do it?
Regards.
Peter

REPLY

Circuit Basics on August 1, 2016 at 4:01 pm

The datasheet will tell you how to recalibrate

REPLY

10.

jckonekampJuan on February 7, 2016 at 10:24 pm

I inverted the signal and + connectors by error. May I have burned the sensor? I have the same Keyes sensor as in this tutorial.
Thanks, Juan

REPLY

Circuit Basics on June 8, 2016 at 6:09 pm

Probably not, since the signal is at the same voltage as Vcc. If you swap the Vcc and signal pins, the output will just read -999.00 for temp and humidity.

REPLY

arunabha on October 19, 2016 at 10:04 am

sir i m still getting -999.oo as temp and humidity aftr swapping both ways

REPLY

Twl on December 30, 2016 at 9:31 am

I'm getting – 999 value too... Any idea?

REPLY

gregmlopes on January 18, 2017 at 11:14 pm

vcc is the left one, signal the middle one and ground is the round one, in case of a 3 pin DHT11. the diagram above is not right. i was getting the same problem here.

REPLY

D R SOLANKE on February 22, 2017 at 2:26 pm

sir i m still getting -999.oo as temp and humidity aftr swapping both ways

REPLY

CHETHAN B R on April 15, 2017 at 1:38 pm

hi guys.. i found the bug.. u need to pull up data/out/signal line with 10K to +ve line,

Please do chk with multimeter.. u should get 10K between these two lines.. (S & +)

IN MY CASE IN THE DHT-11 BOARD WRONG RESISTOR WAS SOLDERED, WITHOUT KNOWING TAT I HAD TRIED ALL STUFF, GIVEN 10K PULL UP ADDITIONALLY.. DIDN'T WORKED FINALLY TRACED THE RESISTANCE BETWEEN PINS IT WAS 5 OHMS.. THEN BACK TRACED & REMOVED TAT & PULLED UP WITH 10k SOLVED MY ISSUE.. GUESS U TOO HAVE THE SAME ISSUE.. JUST CHK OUT..

CHETHAN BR

REPLY

Maarten on September 10, 2017 at 4:36 pm

Thanks Chetan! That did the trick for me as well! And a big 10Q to Circuit Basics in the first place for all these wonderful tutorials.

REPLY

Circuit Basics on February 26, 2017 at 11:22 am

The diagram is correct for most three pin DHT11 modules. Depending on the manufacturer, the pins on the PCB might be different though. The pins should be labelled with S for signal and "-" or "GND" ground.

REPLY

11.

omphile on February 9, 2016 at 6:13 am

hello

I would like to know what these three lines mean

```
int chk = DHT.read11(DHT11_PIN);
Serial.print("Temperature = ");
Serial.println(DHT.temperature);
```

REPLY

Circuit Basics on June 8, 2016 at 6:21 pm

int chk = DHT.read11(DHT11_PIN); reads the signal pin of the DHT11 (pin 7) that is defined in #define DHT11_PIN 7.

Serial.print("Temperature = "); simply prints "Temperature = " to the serial monitor.

Serial.println(DHT.temperature); prints the actual temperature reading from the DHT11 to the serial monitor

REPLY

12.

Mohammad on February 19, 2016 at 3:09 pm

when i am verify this project its not complete the project

because this command (dht DHT;) 'dht' does not name a type

what i do please.

REPLY

Ghulam Mehdi Bhutto on February 23, 2016 at 10:32 am

u have to download and save dht library in Arduno Libraries

REPLY

13.

Adnan on February 24, 2016 at 1:44 pm

I need full code of the sensor connected to LCD

REPLY

Circuit Basics on August 1, 2016 at 4:03 pm

See the section "Output Humidity and Temperature Readings to an LCD Display" on a desktop... If you are viewing it on mobile, the full code might not display. Hope this helps

REPLY

14.

Jordan on February 26, 2016 at 5:51 am

Hey is it possible to run a serial monitor with the LCD screen hooked up as well?

REPLY

ptuttoilmondo on March 5, 2016 at 9:34 am

Io l'ho fatto con questo codice che stampa a display le info e parallelamente lp fà anche sulla seriale, credo volessi questo:

#include
#include

```
dht11 DHT11;

#define DHT11_PIN 7

LiquidCrystal_I2C lcd(0x27,16,2);

void setup(){
Serial.begin(9600);
lcd.init(); // initialize the lcd
}

void loop()
{
int chk = DHT11.read(DHT11_PIN);
Serial.print("Temperature = ");
Serial.println(DHT11.temperature);
Serial.print("Humidity = ");
Serial.println(DHT11.humidity);
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("Temp. ");
lcd.print((char)223);
lcd.print("C = ");
lcd.print(DHT11.temperature);
lcd.setCursor(0,1);
lcd.print("Umidita' % = ");
lcd.print(DHT11.humidity);
delay(1000);
}
```

REPLY

15.

Jesus Garcia Urtiaga on April 6, 2016 at 12:35 pm

Thank you, works really nice the DHT Lib

REPLY

16.

dilawar on April 10, 2016 at 12:47 pm

Arduino: 1.6.8 (Windows 7), Board: "Arduino/Genuino Uno"

C:\Users\dillu\Documents\Arduino\my\my.ino:1:17: fatal error: dht.h: No such file or directory

#include

^

compilation terminated.

exit status 1
Error compiling for board Arduino/Genuino Uno.

PPlIzzz help me sir.

REPLY

dilawar on April 10, 2016 at 1:13 pm

ok sir now i got it

REPLY

Circuit Basics on June 8, 2016 at 6:17 pm

It's probably because you need to install the DHT library

REPLY

17.

JAAPSON PCB on April 16, 2016 at 3:00 am

nice

REPLY

18.

dev on April 16, 2016 at 10:44 am

works well

REPLY

19.

Alex on April 20, 2016 at 4:51 am

I've tried several DH11s and all of them are outputting 0.00 for temperature and humidity (in serial monitor) any idea what could be going wrong?

REPLY

Circuit Basics on August 1, 2016 at 4:05 pm

It could be something with the wiring... Could you double check that everything is wired correctly? Have you used a different pin for the signal?

REPLY

waweruh on February 2, 2017 at 8:07 am

try cheeck the line
int chk = DHT11.read(DHT11_PIN);
worked well on me

REPLY

Eman on September 10, 2017 at 7:07 pm

can you connect with me please i need your help
emy_elbehiry@yahoo.com

REPLY

20.

Hamza mohammed on May 8, 2016 at 9:20 pm

Excellent ..good job..

REPLY

21.

Hemachandra on May 11, 2016 at 10:30 am

It's nice after looking this.
I need a small help.Can I use the humidity and temperature readings later for predicting a rainfall?
So that if rain fall is spotted by the sensor so that I could give an alert to the user by sending a message to his phone.
Can you guys help me in this. All I want is to design a circuit that could predict a rainfall or water and send a message to the user to his phone.Also keeping in mind about the humidity and temperature factors.
This helps me in saving the laboratory equipment by predicting the water or rainfall.
Please help me with this.
Thank you

REPLY

Circuit Basics on August 1, 2016 at 4:09 pm

You would probably be better off using a barometer like the BMP180 for that. A falling barometric pressure can predict possible rainfall.

REPLY

22.

damsiri on May 14, 2016 at 11:58 am

exit status 1
Error compiling for board Arduino/Genuino Uno.
can you help me plzzz

REPLY

Circuit Basics on June 8, 2016 at 6:16 pm

Exit status 1 means that there is an error compiling your code. Check out this thread: http://forum.arduino.cc/index.php?topic=365466.0

REPLY

23.

anew on May 16, 2016 at 12:00 am

Thank you

REPLY

24.

Jake on May 20, 2016 at 3:28 am

Will it still work if you don't solder

REPLY

Circuit Basics on June 8, 2016 at 6:13 pm

Sure, I set it up on a breadboard.

REPLY

Gabriel on July 20, 2016 at 12:47 pm

Could you set up both the LCD display and the sensor on the same breadboard. (I'm very new to this...)

REPLY

Circuit Basics on February 26, 2017 at 11:27 am

Yeah you can, as long as the breadboard is big enough. I have a 84 x 55mm board that fits an LCD and the sensor. It's a little tight though

REPLY

25.

MSD on June 10, 2016 at 3:42 am

What is that Ic used to send data to the arduino ....give me a number of that ic

REPLY

Circuit Basics on August 1, 2016 at 4:23 pm

The datasheet only says that it's an 8-bit microcontroller. The chip itself doesn't have any markings on it either so I'm not sure

REPLY

26.

daniel click on June 14, 2016 at 3:49 pm

how do i make this control relays

REPLY

Circuit Basics on August 1, 2016 at 4:11 pm

Check out this article: http://www.circuitbasics.com/build-an-arduino-controlled-power-outlet/

At the end of the article I use a DHT11 to control a 5V relay...

REPLY

27.

Abid on June 27, 2016 at 11:41 am

I have made another code for the serial Print:

#include

dht DHT;
#define DHT11_PIN 7

```
void setup(){

Serial.begin(9600);

delay(500);//Delay to let system boot

Serial.println("DHT11 Humidity & temperature Sensor\n\n");

delay(1000);//Wait before accessing Sensor

}//end "setup()"

void loop(){

//Start of Program
int chk = DHT.read11(DHT11_PIN);

Serial.print("Current Humidity = ");

Serial.print(DHT.humidity);

Serial.print("% ");

Serial.print("Current Temperature = ");

Serial.print(DHT.temperature);

Serial.println("C ");

delay(1000);//Wait 1 seconds before accessing sensor again.

//Fastest should be once every two seconds.

}// end loop()
```

REPLY

28.

Dr Nor on July 4, 2016 at 3:34 am

Here is some simple code to output the DHT11 to a 16×2 LCD (with built in controller)
Outputs Fahrenheit, Celsius & Humidity:

Make sure you have the 3 libraries noted #include

```
// ***** Works for temp and humid display on LCD I2C 7/3/2016 *****

// Shows Fahrenheit, Celsius & Humidity

#include //library from ...malpartida
#include
#include

//For LCD display 2 rows x 16 Characters
//For LCD with built in controller
//LCD pin SDA to Arduino Analog pin A4
//LCD pin SCL to Arduino Analog pin A5
//LCD power is 5V
```

```
//DHT11 Temp and humidity sensor in Celsius
//Signal wire of DHT11 to Arduino Digital pin 8
//DHT11 sensor power is 5V (middle pin on sensor)

LiquidCrystal_I2C lcd(0x3F, 2, 1, 0, 4, 5, 6, 7, 3, POSITIVE);
dht DHT;

/*—( Declare Constants, Pin Numbers )—*/

#define DHT11_PIN 8 //DHT11 Signal wire to pin 8

void setup()
{
lcd.begin(16,2); //16 by 2 character display
}

void loop()
{
delay(1000); //wait a sec (recommended for DHT11)
int chk = DHT.read11(DHT11_PIN);
switch (chk)

lcd.clear(); //Clears any previous message on LCD

//Print temp on line 1 (use 0 to indicate line 1)
//(0,0) indicates (Character position from left, Row 0=1 1=2)
lcd.setCursor(0,0); //next print line shows on LCD line 1
lcd.print("Temp= ");
lcd.print(DHT.temperature, 0);
lcd.print(" C ");
lcd.print(DHT.temperature * 1.8 + 32, 0); //Fahrenheit conversion
lcd.print(" F ");

//Print Humidity on line 2 (use 1 to indicate line 2)
//(0,1) indicates (Character position from left, Row 0=1 1=2)
lcd.setCursor(0,1); //next print line shows on LCD line 2
lcd.print("Humidity = ");
lcd.print(DHT.humidity, 0);
lcd.print(" %");

delay(15000); //Shows data for 15 sec then refreshes screen with next line
lcd.clear(); //Clears any previous message on LCD
}
```

REPLY

29.

Dr Nor on July 4, 2016 at 3:39 am

For some reason the 3 libraries to include were deleted from the code above. Here they are:

```
#include
#include
#include
```

REPLY

Dr Nor on July 4, 2016 at 3:40 am

they keep getting blocked:

LiquidCrystal_I2C.h
dht.h
Wire.h

REPLY

30.

Hadi on July 9, 2016 at 2:10 am

If i want to mix lcd,dht 11 and heater for use arduino?can you description program?

REPLY

Circuit Basics on February 26, 2017 at 11:33 am

It sounds like you want to control the heater with the DHT11 and have the readings output to an LCD too... You can use the DHT11 to control the signal to a 5V relay, similar to what's done in this article: http://www.circuitbasics.com/build-an-arduino-controlled-power-outlet/

Then you just need to add the code to initialize the LCD, include the LiquidCrystal library, and change the "serialprint()" functions to "lcd.print(). We have another article on setting up an LCD on the Arduino if you need help with it: http://www.circuitbasics.com/how-to-set-up-an-lcd-display-on-an-arduino/

REPLY

31.

John Lorenzo on July 14, 2016 at 3:40 am

hi. i am currently working on a project with arduino, lcd, dht11 sensor, and relays.
i didnt have any trouble interfacing the arduino, lcd and the dht11 sensor and my codes were quite right since when i run it, nothing's odd in the output.
but when i connect the relay,in which an ac device is connected, as an output that turns on after a couple of minutes, the temperature and humidity dislayed on the lcd becomes odd, like chinese and numbers, after some time.
i checked my codes but i cant figure out whats wrong with it.
i hope you can help me out with this.
thank you...

REPLY

Circuit Basics on February 26, 2017 at 11:37 am

Could you post the code here?

REPLY

ishanudayanga on June 5, 2017 at 6:51 am

please help me.. i won't get Alarm temperature and humidity..and show in lcd display 16×2.. and changeing temperature, humidity alarm set point HOW IS DO... PLEASE HELP ME.

REPLY

32.

Adrian Wilkins on July 15, 2016 at 3:54 pm

Nice video but a bit hard to follow the lcd steps for a NOOB like me because of the angle of the camera.

REPLY

> **Circuit Basics** on August 1, 2016 at 4:28 pm
>
> Sorry about that… Thanks for the input! I'll try to make it easier to see in future videos

REPLY

33.

Klardo on July 27, 2016 at 6:00 pm

Very nice! It's very nice! Big thank you for the article, my friend! May you prosper and live long!

REPLY

> **Circuit Basics** on August 1, 2016 at 4:29 pm
>
> Thank you very much!

REPLY

34.

Ramesh k. pandey on August 4, 2016 at 2:18 pm

it is very nice project,i tried n working satisfactory.

REPLY

35.

verbage on August 7, 2016 at 5:27 am

So curiously, I had already downloaded and installed the latest version of DHTLib (v0.1.21) versus the older version (v0.1.14) that is provided here. And I kept getting 0.00 values for the temp and humidity readings as Alex reported on April 20, 2016 in a posting above. I scratched my head for a while until I remembered I had the newer version of the library installed. So I removed that, installed the older v0.1.14 version, and bam, lo and behold, I started getting real values back. So this may be the same problem that Alex had, too.

I've looked at the brief changelog history in dht.cpp file, and I'm seeing no obvious reason that might allow v0.1.14 to work, but not the newer v0.1.21. Anyone have thoughts about this?

REPLY

36.

David on August 7, 2016 at 5:05 pm

Pretty informative. It's good idea for projects. I am thinking of building my own weather unit soon. I think I can use some help from this. Thanks for sharing this!

REPLY

37.

verbage on August 10, 2016 at 6:20 pm

Any comments about DHTLib v0.1.14 vs. v0.1.21, and why this simple Arduino sketch works in the former, but not the latter? The brief history in the cpp file header for v0.1.21 looks like it took care of a few issues so my first instinct is to use that, but again, it results in all zero readings. Anyway, if no comments, well, I'll have to take a look through the diffs between the two versions to see what might be causing the issue.

REPLY

Circuit Basics on February 26, 2017 at 11:39 am

That's interesting, please post your findings if you see anything!

REPLY

38.

Sisir Patnaik on August 12, 2016 at 7:37 pm

Thanks for the useful post.

I followed the instructions. Sensor connection is fine and have uploaded the code successfully.

But I am getting the output as -999. Can you please tell me the possible reason why I am facing this problem. Does it mean the sensor is faulty?

REPLY

Sisir Patnaik on August 12, 2016 at 8:25 pm

It is a DHTLIB_ERROR_TIMEOUT as I checked the value of chk in the code. Please help

REPLY

ahlam on September 16, 2016 at 5:33 am

hello...i'm also have the same problem...could u help me...

REPLY

gregmlopes on January 18, 2017 at 11:15 pm

vcc is the left one, signal the middle one and ground is the right one, in case of a 3 pin DHT11. the diagram above is not right. i was getting the same problem here.

REPLY

Circuit Basics on February 26, 2017 at 11:44 am

The diagram is correct, but your particular DHT11 could have a different pinout depending on the manufacturer. The DHT11 I used is from Keyes, what type do you have?

REPLY

Circuit Basics on February 27, 2017 at 5:47 am

Are you using the four pin DHT11? If so you'll need to put a 10K Ohm resistor between the Signal line and Vcc. I just added another diagram to the post to make it a bit clearer. That may be causing your issue.

REPLY

39.

Ra Ta on August 17, 2016 at 3:29 pm

nice #DIY replacement for Sling Psychrometer and chart https://t.co/Hnt5797GZr

REPLY

40.

Nathan on August 20, 2016 at 1:14 am

is there a aerial view of how everything goes in?

REPLY

41.

Tinashe on August 22, 2016 at 8:05 am

Thanks a lot, may you please help me out, I am using a Mega 2560 with a DHT11 sensor, my problem is that both temperature and humidity reading is just being reed as 0.00 and they are not changing. What might i be doing wrongly, I have even tried the code that accompanies these tutorials

REPLY

Circuit Basics on February 27, 2017 at 5:42 am

Which DHT library did you install? There is an issue with version 0.1.21. The download in the post above is version 0.1.14, which works fine.

REPLY

42.

Lula on August 31, 2016 at 2:48 am

This seems like a really simple setup, but I've been having a lot of trouble setting this up. Have there been changes to this library? I have downloaded it, but arduino still refuses to recognize dht or any of the related functions, like temperature/humidity. It had a lot of trouble with line 3, dht DHT;. Any advice?

Thanks for this great resource!

REPLY

Circuit Basics on February 27, 2017 at 5:44 am

Yes, the library was updated recently (v. 0.1.21) and doesn't seem to work. If you download the zip file I put in the post, it should work. It's the older version 0.1.14.

REPLY

43.

Paul on September 2, 2016 at 3:34 pm

Hi, you mentioned you added a piece of code to show the "degree" symbol," lcd.print((char)223)", can you tell me if the number 223 is from the ASCII table. I have looked at the ASCII table and the number for the degree symbol is 248. Can you please advise.
Many thanks in advance.

REPLY

44.

Reilly on September 16, 2016 at 1:24 am

I get this error
This report would have more information with
"Show verbose output during compilation"
enabled in File > Preferences.
Arduino: 1.0.6 (Windows NT (unknown)), Board: "Arduino Uno"
sketch_sep16a:3: error: 'dht' does not name a type
sketch_sep16a.ino: In function 'void loop()':
sketch_sep16a:13: error: 'DHT' was not declared in this scope

REPLY

45.

kite on September 21, 2016 at 1:18 am

can u give the codes for the serial display cause this code works only for the parallel display

REPLY

46.

kite on September 21, 2016 at 1:23 am

and sir thank you you are very helpful and its very easily to understand ☺

REPLY

47.

ahlam on September 21, 2016 at 11:33 pm

hai

I followed the instructions. Sensor connection is fine and have uploaded the code successfully.

But I am getting the output as -999. Can you please tell me the possible reason why I am facing this problem. Does it mean the sensor is faulty?

REPLY

gregmlopes on January 18, 2017 at 11:16 pm

vcc is the left one, signal the middle one and ground is the right one, in case of a 3 pin DHT11. the diagram above is not right. i was getting the same problem here.

REPLY

48.

light on September 28, 2016 at 2:13 pm

hello.

er..could u pliz explain how to set up the code so the temperature sensor,soil moistue sensor and humidity sensor can workout?im new in arduino..:')

REPLY

49.

Han|s on September 30, 2016 at 2:28 pm

can this be used on a rpi?

REPLY

Circuit Basics on February 27, 2017 at 5:49 am

Yes it can, actually we have another tutorial on how to set it up on the Raspberry Pi: http://www.circuitbasics.com/how-to-set-up-the-dht11-humidity-sensor-on-the-raspberry-pi/

REPLY

50.

bernard on October 5, 2016 at 11:29 am

i am doing fire alarm system using dht and lcd and GSM sim800l how can i make argument to send message from gsm if the sensor reading is higher that the set temp and how to declare it thanks for your response

REPLY

51.

Kachi on October 7, 2016 at 6:46 am

hi! i'm kachi
After uploading a code my dht-11 keeps reading zero '0' for both humidity and temperature as the output on my serial monitor. please what could be the problem?

REPLY

Prajwal K on October 26, 2016 at 5:28 pm

i got a similar problem. getting output as -999.00 for both humidity and temperature.please help!!

REPLY

Prajwal K on October 26, 2016 at 5:29 pm

getting output as -999.00 for both humidity and temperature.please help!!

REPLY

Circuit Basics on February 27, 2017 at 9:23 am

Hi Kachi, I believe this is a problem with an updated version of the DHTLib library (version 0.1.21). If you download the library from this post (it's version 0.1.14) instead of from github it should work.

REPLY

52.

Shreyash Churi on October 8, 2016 at 3:11 pm

i get this error while i upload the program

avrdude verification error first mismatch at byte 0x0000

plzz help

REPLY

53.

gesto on October 12, 2016 at 2:05 pm

I am new in this game with very limited knowledge ,I found your detailed instructions very informative and accurate .
I am very happy to inform you that I fixed successfully the temp and humidity project with LCD display. I would like to subscribe but cannot find the link.Many thanks
gesto

REPLY

54.

Jian Gamboa on November 9, 2016 at 3:04 pm

Do you know how to average the readings from DHT11 using Ardunio Uno? thanks.

REPLY

55.

Jonathan Paul on November 15, 2016 at 5:54 pm

how can i output the average readings from DHT11 using Arduino uno

REPLY

56.

Ahsan Khan on November 23, 2016 at 7:40 am

what is the values of resistors??

REPLY

57.

Aidil Z on December 5, 2016 at 7:06 pm

hello, can i know how to stop the sensor from reading? for example i only want it to read 10 value then stop. can anyone teach me?

REPLY

Fazlan Ahmed on December 20, 2016 at 4:35 am

You can do it in using for loop method. You should replace all the Serial.print lines to the "void setup()" function.

REPLY

58.

jjp06 on December 21, 2016 at 8:07 am

hello, I used Wemos D1 wifi based ESP8266 and dht 11 but there's wrong in the code of cpp and .h i dont know what to do..

REPLY

jjp06 on December 21, 2016 at 8:21 am

Arduino: 1.6.11 (Windows 8.1), Board: "WeMos D1(Retired), 80 MHz, 115200, 4M (3M SPIFFS)"

Build options changed, rebuilding all
In file included from
C:\Users\mhine\Documents\Arduino\libraries\DHTLib\dht.h:18:0,

from C:\Users\mhine\Documents\Arduino\libraries\DHTLib\dht.cpp:30:

C:\Users\mhine\Documents\Arduino\libraries\DHTLib\dht.cpp: In member function 'int dht::_readSensor(uint8_t, uint8_t)':

C:\Users\mhine\AppData\Local\Arduino15\packages\esp8266\hardware\esp8266\2.2.0\cores\esp8266/Arduino.h:227:63: error: cannot convert 'volatile uint32_t* {aka volatile unsigned int*}' to 'volatile uint8_t* {aka volatile unsigned char*}' in initialization

#define portInputRegister(port) ((volatile uint32_t*) &GPI)

^

C:\Users\mhine\Documents\Arduino\libraries\DHTLib\dht.cpp:116:29: note: in expansion of macro 'portInputRegister'

volatile uint8_t *PIR = portInputRegister(port);

^

exit status 1
Error compiling for board WeMos D1(Retired).

This report would have more information with
"Show verbose output during compilation"
option enabled in File -> Preferences.

REPLY

picklingjeff on January 10, 2017 at 4:59 pm

Hi. I have the same issue with the same board. Did you get it to succeed in the end? I would be interested, but I feel that it may be a compatibility issue with a 3rd-party board. I have tried the exact code with other Arduinos that I have and it works just fine.

REPLY

Circuit Basics on February 27, 2017 at 5:38 am

I get this same error when I try to use the Arduino 101 instead of the Uno. I think the library doesn't support the board. I would try finding a different DHT library, there are several others out there.

REPLY

59.

eze on December 23, 2016 at 3:08 pm

Please can someone help me with a simulation circuit that will show the response graphs of dht11 for temperature and humidity

REPLY

60.

Rok on December 28, 2016 at 8:14 pm

Problem with -999.0 also here... I don't konw what to do...

REPLY

Rok on December 28, 2016 at 8:22 pm

My bad. I forgot to connect vcc wire to sensor 😀

REPLY

61.

seb on January 4, 2017 at 3:40 am

I got approx 1 of 5 reading that end with "Data not good, skip" Is it a sensor issue ??

REPLY

62.

ajioz1 on January 12, 2017 at 1:59 am

Hi,

I Have issues with the Arduino recognizing the file dht.h. Was told no such file exist, meanwhile I have uploaded the zip file into the Arduino IDE, which showed in the file directory.

How do I solve this?

REPLY

Circuit Basics on February 27, 2017 at 5:53 am

Did you use the library in the zip file from the post, or did you download it from the Arduino.cc page? Version 0.1.21 has some issues and doesn't appear to work. The zip file in the post is version 0.1.14, and it does work. Also, are you using the Uno, or another board? I couldn't get the library to work on my Arduino 101...

REPLY

63.

thejas on January 22, 2017 at 4:43 pm

why this happening
No such file or directory
compilation terminated. sir

REPLY

64.

Davidius on January 24, 2017 at 11:53 am

In this language, does declaring an object variable (as in "dht DHT;") automatically instantiate it? I am more used to other languages that would need to follow the declaration with something along the lines of "DHT = new dht(params, for, constructor);" Does this normally go without saying in C++, or is this something the Arduino environment automatically adds at the preprocessing** stage?

**: If not "preprocessing," then whatever else Arduino parlance calls the process of converting/expanding the "Processing" (??) or "Wiring" (???) code into standard C/C++ ????

REPLY

65.

D R SOLANKE on February 22, 2017 at 1:36 pm

should i connect pin 7 of arduino uno?
PD7 OR PB7

REPLY

D R SOLANKE on February 22, 2017 at 2:27 pm

sir i m still getting -999.oo as temp and humidity aftr swapping both ways

REPLY

LM on September 10, 2017 at 2:00 pm

DId you fix this? I am getting -999 for one second, then the correct readings for another second, flashing between the two.

REPLY

66.

D R SOLANKE on February 22, 2017 at 2:38 pm

NOW getting output as 0.00 for both humidity and temperature.please help!!

REPLY

Circuit Basics on February 27, 2017 at 5:55 am

Try using the library in the zip file from the post (version 0.1.14). It sounds like you're using the newer version (0.1.21) that is having some problems...

REPLY

D r SOLANKE on February 27, 2017 at 8:30 am

where should i 11 get dht11 library version 0.1.14?

pls reply..

thanks

REPLY

67.

Anas Ahmed on February 25, 2017 at 10:34 am

Need Circuit Diagram of Arduino connecting with LCD
ASAP
THANKS

REPLY

Circuit Basics on February 27, 2017 at 5:31 am

Check this article: http://www.circuitbasics.com/how-to-set-up-an-lcd-display-on-an-arduino/

REPLY

68.

D r SOLANKE on February 27, 2017 at 9:30 am

I AM GETTING ERROR WHILE COMPILING THE PROGRA CODE

"avrdude: stk500_getsync(): not in sync: resp=0x00"

REPLY

69.

Boulossss on March 1, 2017 at 10:39 am

Hi, Is there a way to send alerts to an email address if the temperature and humidity is above a certain value?

REPLY

70.

Anna on March 1, 2017 at 8:46 pm

Hi there,

I had en error when I run the first sketch.

Arduino: 1.8.0 (Mac OS X), Board: “Arduino/Genuino Uno”

humidity:22: error: redefinition of ‘dht DHT’
dht DHT;
^
/Users/anna/Documents/Arduino/humidity/humidity.ino:3:5: note: ‘dht DHT’ previously declared here
dht DHT;
^
/Users/anna/Documents/Arduino/humidity/humidity.ino: In function ‘void setup()’:
humidity:26: error: redefinition of ‘void setup()’
void setup(){
^
/Users/anna/Documents/Arduino/humidity/humidity.ino:7:6: note: ‘void setup()’ previously defined here
void setup(){
^
/Users/anna/Documents/Arduino/humidity/humidity.ino: In function ‘void loop()’:
humidity:30: error: redefinition of ‘void loop()’
void loop()
^
/Users/anna/Documents/Arduino/humidity/humidity.ino:11:6: note: ‘void loop()’ previously defined here
void loop()
^
exit status 1
redefinition of ‘dht DHT’

This report would have more information with
“Show verbose output during compilation”
option enabled in File -> Preferences.

What can I do?

Thanks!

REPLY

71.

Manikanta on March 4, 2017 at 5:31 pm

bro i need some help .i want code for uploading the values read by sensor to web server.

REPLY

72.

Mohamed on March 5, 2017 at 3:38 pm

Can someone help me to burn a light if the DHT11 detect something?

REPLY

73.

Robin Cole on March 15, 2017 at 7:44 pm

Would be great to see similar articles featuring MicroPython ?

REPLY

74.

John (@John__Burns) on March 28, 2017 at 7:08 pm

Excellent article! I have a DHT11 on order and will refer to this when I test it out. Thank you so much. Oh.. and have followed on Twitter too!

REPLY

75.

abcd on April 4, 2017 at 5:49 pm

the area of land it measures? approximately

REPLY

76.

Muhammad Aldrin on April 4, 2017 at 11:10 pm

I have programmed sensor DHT 11 using microcontroller, but i have not tried program this sensor using Arduino

REPLY

77.

viji on April 18, 2017 at 1:39 pm

sir please can you say me why it is responding as board COM1 unavailable

REPLY

78.

zoom on April 23, 2017 at 8:48 am

hey can you pls help me how to use rf module with the above project. i am using two arduino uno, DHT11, LCD, RF transmitter and receiver. please can u give me a code to display temperature and humidity on the receiver side lcd...

REPLY

79.

lala on April 26, 2017 at 12:57 pm

how about the new coding if i add another sensor which is smoke sensor (mq-2). Could you please show me the coding

REPLY

80.

alon on April 27, 2017 at 12:35 pm

why is the pull-up resistor needed?
let me konw if i understand it correctly:
the logic level on the data pin is HIGH, and that means the arduino and the dht are not communicating.
to start the cummunication the ardduino will give LOW to the data line,after

the dht finished the transmition of data,the line will return to HIGH,IS THAT CORRECT???

REPLY

81.

alon on April 27, 2017 at 12:40 pm

why do you need the pull-up resistor?
let me know if i understant it correctly:
when thre is no communication between the arduino and the dht,the data line is HIGH
to star the communication the arduino will put LOW is the data line,after the transmiting is over the kine will return to HIGH
IS THAT CORRECT???

REPLY

82.

sAM RUFESH on July 4, 2017 at 12:29 pm

Is there any way to change it from Celsius to Fahrenheit?

REPLY

skyfox66 on July 27, 2017 at 12:17 am

```
#include
#include

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

dht DHT;

#define DHT11_PIN 7

void setup(){
lcd.begin(16, 2);
}

void loop()
{
delay(1000); //wait a sec (recommended for DHT11)
int chk = DHT.read11(DHT11_PIN);
switch (chk)

lcd.clear(); //Clears any previous message on LCD
lcd.setCursor(0,0);
lcd.print("Temp: ");
//lcd.print(DHT.temperature);
//lcd.print("C");
lcd.print(DHT.temperature * 1.8 + 32); //Fahrenheit conversion
lcd.print((char)223);
lcd.print("F");
lcd.setCursor(0,1);
lcd.print("Humidity: ");
lcd.print(DHT.humidity);
lcd.print("%");
```

delay(15000); //Shows data for 15 sec then refreshes screen with next line
lcd.clear(); //Clears any previous message on LCD
}

REPLY

skyfox66 on July 27, 2017 at 12:18 am

Libraries: dht.h, LiquidCrystal.h

REPLY

83.

ulisse on August 30, 2017 at 12:24 pm

How can storage them date on sd-card?

REPLY

84.

Falah on September 2, 2017 at 5:17 pm

Hello.. can i know how to programme dht11 with basic stamp 2 ?

REPLY

85.

Gaganpreet on September 2, 2017 at 10:23 pm

I connected the LCD and the DHT11 and copied and pasted the code. It uploaded and then I look at my LCD and all I see are white boxes on the top of the display. Can anyone help me?

REPLY

86.

gervase on September 3, 2017 at 6:35 pm

I also need to know how to change from celsius to farehneit. As an older generation person, i still don't always think metric!

REPLY

87.

LM on September 10, 2017 at 1:56 pm

I copied this exactly and got it to display temperature and humidity, but it flashes -999 for temp and -999 for humidity every other second. For example, it will display correct readings for one second, then the -999 for both readings the next second.. Flashing between the two. Any ideas why it might be doing this. I have been playing with the code, rechecking pins, etc, but I cant seem to pinpoint the problem. Any input is appreciated.

REPLY

88.

Eman Adel Elbehiry on September 11, 2017 at 2:52 pm

How to connect 3 form dht11 together with arduino?

REPLY

89.

Hamza on September 19, 2017 at 12:21 pm

Excuse me, what's the work of line 3 ? "dht DHT;"

REPLY

LEAVE A REPLY

Your email address will not be published. Required fields are marked *

COMMENT

NAME *

EMAIL *

WEBSITE

Send new posts to my inbox.

Notify me of follow-up comments by email.

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