QUICK REFERENCE · TK39

DHT22 Temperature and Humidity

Tenths of a degree, from −40 to 80 °C, down one wire.

VCC sets the data line The 10 kΩ pull-up ties DATA to VCC. **On an ESP32, ESP32-S3 or Pico, feed VCC from 3V3, never 5V**: 5 V would idle on a 3.3 V input. On an Uno, 5V.

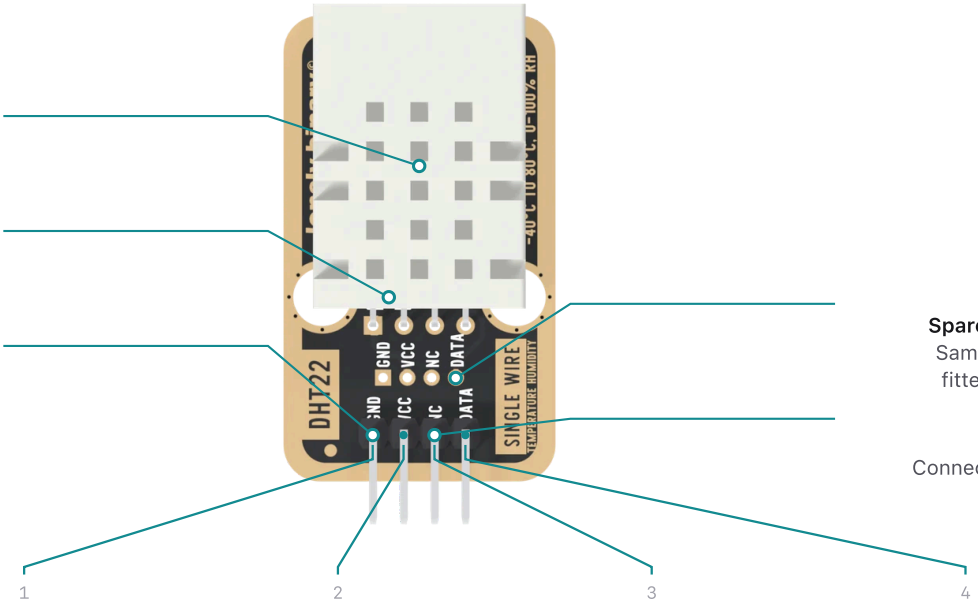
Pins, and which to wire

Sensor up, header at the bottom. Wire GND, VCC and DATA; NC is connected to nothing on the board.

DHT22, white cage
−40 to 80 °C, ±0.5 °C.
Overhangs the top edge.

10 kΩ pull-up
Hidden under the cage.
Fitted: add nothing.

GND is the square pad
Count from it: GND, VCC, NC, DATA.



Spare 2.0 mm pads
Same nets, nothing fitted. Leave them.

NC
Connected to nothing on the board.

Front	GND	VCC	NC	DATA
Single wire	GND	VCC	●	DATA

Declare DHT22, not DHT11 Both send 40 bits with a valid checksum, packed differently. The wrong type prints a confident wrong number, not an error.

What the DHT22 can tell you

Temperature

±0.5 °C, in tenths

−40 to 80 °C. Below freezing it sends a sign bit; the library handles it.

Humidity

±2 % RH, in tenths

0 to 100 %, the whole range.

How often

2 s between reads

The datasheet's floor, and the library's 2 s cache.

Precise enough to log, plot and switch on. Mount it away from anything warm: a sensor on a breadboard beside a regulator measures the regulator.

From Aosong's DHT22 (AM2302) datasheet and Adafruit's DHT sensor library 1.4.7. Accuracies are the datasheet's; nothing on this sheet was measured.

The first reading, on a timer

Arduino IDE · Library: DHT sensor library (Adafruit), with Adafruit Unified Sensor · ESP32-S3: USB CDC On Boot: Enabled

```
#include <DHT.h>   // DHT sensor library by Adafruit

// DATA's pin. Uno: D2. ESP32: 18. ESP32-S3: 4. Pico: GP2.
#define DHT_PIN  4
#define DHT_TYPE DHT22   // must match the cage: white

DHT dht(DHT_PIN, DHT_TYPE);
unsigned long last = 0;

void setup() {
  Serial.begin(115200);
  dht.begin();
}

void loop() {
  if (millis() - last < 2500) return;   // over the library's 2 s ca
  last = millis();

  float h = dht.readHumidity();
  float t = dht.readTemperature();
  if (isnan(h) || isnan(t)) {        // nobody answered
    Serial.println("read failed");
    return;
  }
  Serial.print(t, 1); Serial.print(" C  ");
  Serial.print(h, 1); Serial.println(" %");
}
```

```
23.4 C 51.2 %
23.5 C 51.0 %
```

Serial Monitor at 115200, one line every 2.5 seconds, in tenths.

Wiring

	FRONT	UNO	ESP32	S3	PICO
1	GND	GND	GND	GND	GND
2	VCC	5V	3V3	3V3	3V3
3	NC				
4	DATA	D2	GPIO 18	GPIO 4	GP2

Hole 1 is the square pad. VCC is your board's logic voltage, because DATA idles at VCC. The second row of pads above the header is an unfitted 2.0 mm connector on the same nets: leave it.

Tenths, and below zero

The DHT22 sends humidity and temperature as two 16-bit numbers in tenths: 234 is 23.4 °C. The top bit of the temperature is its sign, so −0.1 °C and +0.1 °C differ by that bit alone. Read no faster than every 2 s; a read inside that window returns the last answer.

When it does not work

Every reading is nan

Nobody answered. Check GND, then VCC, then DATA on the pin the sketch names, counting from the square pad: GND, VCC, NC, DATA.

The reading never changes

Reads closer than 2 s apart return the last answer without touching the wire. Time reads with millis().

Works on an Uno, not an ESP32

Check VCC is 3V3. The pull-up takes DATA to VCC, so 5 V there sits on a 3.3 V pin.

Numbers, but silly ones

The type in the sketch does not match the cage. Blue is DHT11, white is DHT22; the checksum passes either way.

Reads warm, and dry

It is measuring the board it sits on. Move it off the breadboard on jumper wires, away from regulators, and wait a few minutes.

Two sensors on one pin

There are no addresses: both answer at once and neither survives. One DATA pin per sensor.

Specifications

Sensor	DHT22, factory calibrated	**Temperature**	−40 to 80 °C, ±0.5 °C
Humidity	0 to 100 % RH, ±2 %	**Steps**	0.1 °C, 0.1 %
Supply	3.3 to 6 V; use your logic voltage	**Current**	1 to 1.5 mA measuring
Pull-up	10 kΩ, DATA to VCC, fitted	**Board**	22.4 × 38.4 mm, 4-pin 2.54 mm header