
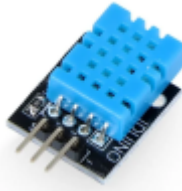






LamaPLC: DHT Temperature /Humidity sensors with 1-wire / I²C communication

The DHT is a popular, low-cost digital sensor that measures both temperature and humidity. DHT22 offers higher accuracy than its predecessor, the DHT11. It is suitable for a wide range of applications, including weather stations and smart home systems.

Type of measurement	Model	Power voltage	Measurement, range, accuracy	Communication	Note
 Temperature Humidity	DHT11 	3.3 / 5 V (3.3 .. 5.5V)	Temperature measurement range: 0 .. +50 °C Temperature measurement accuracy: ±2°C Humidity measurement range: 20..90% RH Humidity measurement accuracy: ±5%	1-Wire	8 bit resolution, response time 10 sec
 Temperature Humidity	DHT20 	3.3 / 5 V (2.2 .. 5.5V)	Temperature measurement range: -40 .. +80 °C Temperature measurement accuracy: ±0.5°C (-40..80) Humidity measurement range: 0..100% RH Humidity measurement accuracy: ±3%	I ² C default addr.: 0x38	-
 Temperature Humidity	DHT22 AM2302 	3.3 / 5 V (2.2 .. 5.5V)	Temperature measurement range: -40 .. +80 °C Temperature measurement accuracy: ±0.5°C (-40..80) Humidity measurement range: 0..100% RH Humidity measurement accuracy: ±2%	single-bus	-

Operation and Usage

The DHTs use a single bus for communication, which requires careful timing; this is typically handled by libraries in microcontroller environments. A 4.7kΩ to 10kΩ pull-up resistor is needed between the data line and VCC for proper communication.

The sensors are available in two main forms: a 4-pin bare sensor and a 3-pin module with the pull-up resistor integrated.

The BME/BMP sensors can be integrated with the [Tasmota](https://tasmota.com/) system. For more details, see here:

- DHT11 sensors: <https://tasmota.github.io/docs/DHT11/>



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2026/02/14 23:38

Arduino & DHT22

To read a DHT22 sensor with an Arduino, you typically use the **Adafruit DHT Sensor Library** along with the Adafruit Unified Sensor Library.

Wiring Details

The wiring depends on whether you have a bare sensor or a module:

- **VCC:** 3.3V to 5V.
- **GND:** Ground.
- **Data (DQ):** Digital pin (e.g., Pin 2).
- **Pull-up Resistor:** Bare 4-pin sensors require a 4.7kΩ to 10kΩ pull-up resistor from VCC to Data. Modules with 3 pins usually have this resistor built-in.

Arduino Example Code

This sketch reads temperature (in Celsius) and humidity every 2 seconds.

```
#include "DHT.h"

#define DHTPIN 2      // Digital pin connected to the DHT sensor
#define DHTTYPE DHT22 // DHT 22 (AM2302), AM2321

// Initialize DHT sensor.
DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(9600);
  Serial.println(F("DHT22 test!"));
  dht.begin();
}

void loop() {
  delay(2000); // Wait 2 seconds between measurements

  // Read humidity and temperature
  float h = dht.readHumidity();
```

```

float t = dht.readTemperature();
float f = dht.readTemperature(true); // Temperature in Fahrenheit

// Check for read failures
if (isnan(h) || isnan(t) || isnan(f)) {
  Serial.println(F("Failed to read from DHT sensor!"));
  return;
}

// Print results
Serial.print(F("Humidity: "));
Serial.print(h);
Serial.print(F("%  Temperature: "));
Serial.print(t);
Serial.print(F("°C "));
Serial.print(f);
Serial.println(F("°F"));
}

```

1-wire, I2C topics on lamaPLC

Page	Date	Tags
• lamaPLC Communication: 1-Wire	2026/04/23 21:51	1-wire , communication , bus , microlan , i2c , uart , usart , ds18b20
• lamaPLC Communication: IEC 61850 basic	2026/04/23 21:51	1-wire , communication , bus , xml , iec 61850 , iec , ethernet , scl , goose , ied
• lamaPLC Communication: I²C	2025/09/23 21:25	i2c , i c , smbus , philips , bus , communication , arduino
• lamaPLC project: Sension SCD CO² measurement module	2026/04/15 19:34	scd30 , scd40 , scd41 , iaq , ndir , sensor , i2c , arduino code
• LamaPLC: AHT10 Modul	2026/03/22 03:14	communication , i2c , temperature , humidity , sensor , aht , aht 10 , modul
• LamaPLC: AHT20 / BMP280 Modul	2026/04/23 21:52	bmp280 , aht20 , adafruit , temperature , humidity , pressure , sensor , arduino , code , i2c
• LamaPLC: APDS - Avago ALS and proximity detection sensors with I²C communication	2026/04/23 21:52	avago , apds-9900 , apds-9930 , apds-9960 , als , proximity , detection , gesture recognition , gesture , i2c , communication , sensor , arduino , code
• lamaPLC: Arduino Modul: BME680	2026/05/12 18:40	code , c , 2026 , arduino , bme680 , sensor , i2c , comunication
• lamaPLC: AS5600 Magnetic Induction Angle Measurement Sensor Module	2026/05/13 00:06	communication , i2c , as5600 , as-5600 , magnetic , induction , angle , sensor
• lamaPLC: Bi-Directional Logic Level Converter 3.3V ↔ 5V	2026/04/12 00:34	bi-directional , logic level converter , i2c , uart , spi

<ul style="list-style-type: none"> • LamaPLC: BMP/BME Bosch Temperature/Humidity/Pressure sensors with I²C communication 	2026/04/23 21:52	bme280 , bme680 , bme688 , bmp180 , bmp280 , hw-611 , hw611 , bosch , temperature , humidity , pressure , sensor , arduino , i2c , communication , ai , cjmcu , volatile organic compounds , vocs , volatile sulfur compounds , vscs , iaq
<ul style="list-style-type: none"> • LamaPLC: CJMCU-219/INA-219 breakout board/IC with I²C communication 	2026/04/23 21:52	cjmcu-219 , ina-219 , ina219 , breakout board , i2c , communication , sensor , voltage , current , arduino , code , cjmcu
<ul style="list-style-type: none"> • LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication 	2026/04/23 21:52	cjmcu-3216 , cjmcu , ap-3216 , ap3216 , ambient light , proximity , sensor , arduino , code , i2c , communication
<ul style="list-style-type: none"> • LamaPLC: CJMCU-811 CCS811 Gas Sensor (VOCs TVOC CO₂) 	2026/04/23 21:52	cjmcu-811 , ccs811 , gas , sensor , vocs , tvoc , eco2 , co2 , arduino , air quality metal oxide , mox , i2c , micropython , rp2040-eth
<ul style="list-style-type: none"> • LamaPLC: D6T Omron Non-Contact Thermal Sensors with I²C communication 	2026/04/23 21:52	d6t , d6t-32l , d6t-44l , d6t-8l , d6t-1a , omron , non-contact , thermal , sensor , i2c , arduino , code
<ul style="list-style-type: none"> • LamaPLC: DHT Temperature /Humidity sensors with 1-wire / I²C communication 	2026/04/23 21:52	dht11 , dht20 , dht22 , temperature , humidity , pressure , sensor , 1-wire , arduino , code
<ul style="list-style-type: none"> • LamaPLC: DPS Infineon Temperature/Pressure sensors with I2C communication 	2026/04/23 21:52	dps310 , infineon , temperature , pressure , sensor , arduino , i2c , communication , code
<ul style="list-style-type: none"> • LamaPLC: DS18B20 1-Wire Digital Thermometer 	2026/04/23 21:52	ds18b20 , sensor , 1-wire , communication , arduino , thermometer , parasitic mode
<ul style="list-style-type: none"> • LamaPLC: Energy, power, current, and voltage 	2025/05/31 23:32	i2c , i c , communication , arduino , energy , power , current , sensor , ina226
<ul style="list-style-type: none"> • LamaPLC: ENS ScioSense Multi-gas sensors with I²C communication 	2026/04/23 21:52	ens160 , sciosense , gas-quality , i2c , communication , sensor , arduino , code , eco2 , tvoc , aqi , indoor air quality , iaq , co2 , voc
<ul style="list-style-type: none"> • LamaPLC: ESP32 / ESP8266 	2025/11/22 00:07	esp8266 , esp32 , esp32-c2 , esp32-c3 , esp32-c5 , esp32-c6 , esp32-c61 , esp32-h2 , esp32-s2 , esp32-s3 , esp32-p4 , espressif systems , communication , ethernet , ip , wi-fi , thread , zigbee , matter , homekit , bluetooth , mqtt , adc , spi , uart , i2c , i2s , rmt , pwm , usb , usb otg , twai
<ul style="list-style-type: none"> • LamaPLC: Gas sensors 	2023/07/01 17:29	gas , sensor , i2c , onewire , communication , mq-3 , mq-4 , mq-5 , mq-6 , mq-7 , mq-8 , mq-9 , mq-135 , gm-102b , gm-302b , gm-502b , gm-702b , alcohol , ch4 , natural gas , smoke , lng , co , co2 , lpg , h2 , iso-butane , nox , nh3 , benzene , town gas , formaldehyde , propane , humidity , temperature , voc , grv gas sens v2

• lamaPLC: GY-511 6DOF sensor module	2026/04/23 21:52	stmicroelectronics , lsm303dlhc , i2c , lsm303 , sensor , gy-511 , 6dof , pololu , module , arduino
• LamaPLC: GY-9250 MPU-9250/6500 9-axis Attitude Sensor Board	2026/04/23 21:52	ak8963 , gy-9250 , mpu-9250 , 9-axis , motion detection , magnetometer , communication , i c , i2c , spi
• LamaPLC: HDC Texas Instruments Temperature/humidity sensors with I²C communication	2026/04/23 21:52	sht21 , htu21 , si7021 , gy-21 , gy-213v , hdc1080 , gy-213v-hdc1080 , cjmcu , cjmcu-1080 , texas instruments , temperature , humidity , sensor , i2c , communication , arduino , code
• lamaPLC: HT16K33 display controller	2026/04/23 21:51	i2c , 7-segment display , display , ht16k33 , arduino
• LamaPLC: HTU TE Connectivity temperature/humidity sensors with I²C communication	2026/04/23 21:52	htu , htu31d , htu21d , htu20d , sht20 , htu20 , sht21 , htu21 , si7021 , gy-21 , gy-213v , hdc1080 , si702 , gy-20 , sht31 , htu31 , si7031 , gy-31 , te connectivity , temperature , humidity , i2c , communication , sensor , arduino , code
• lamaPLC: INA modules with Arduino libraries	2026/04/23 21:52	i2c , i c , communication , arduino , energy , power , current , monitor , sensor , ina219 , gy-219 , ina226 , gy-216 , ina228 , gy-228 , ina237 , ina238 , ina260 , ina3221 , ina
• lamaPLC: INA226 - current/voltage/power monitor with I²C communication	2026/04/23 21:52	i2c , i c , communication , arduino , energy , power , current , monitor , sensor , ina226 , ina219 , ina
• lamaPLC: LCD 1602/2004 with I²C communication	2026/02/14 18:27	communication , i2c , display , lcd , 1602 , 2004 , hd44780 , pcf8574 , pcf8574t , pcf8574at , arduino
• LamaPLC: MAX30100/MAX30102 Heart Rate Click Sensor Module	2026/04/23 21:52	max30102 , max30100 , heart rate click , sensor , communication , i2c , arduino , code
• lamaPLC: MCP23017 / MCP23S17 16-Bit I/O Expander with Serial Interface I²C / SPI	2026/04/23 21:52	communication , i2c , mcp23017 , mcp23s17 , spi , i o expander , serial , cjmcu-2317 , cjmcu
• lamaPLC: MLX90614 (GY-906) infrared non-contact thermometer	2026/05/08 00:03	communication , i2c , temperature , mlx90614 , gy-906 , modul , infrared , non-contact thermometer , dsp , pwm , smbus , hailege
• lamaPLC: PCF857x I/O Expander chip/modul with I²C communication	2026/05/15 01:03	communication , i2c , pcf857x , pcf8574 , pcf8574a , pcf8575 , i o expander , i o extension , nxp , texas instruments
• LamaPLC: Pixart PAJ7620U2 Gesture recognition sensors/module with I²C communication	2026/04/23 21:52	paj7620u2 , gy-paj7620 , pixart , gesture recognition , i2c , communication , sensor , arduino , code
• lamaPLC: RP2040_ETH_Modul: I²C scanner	2026/05/12 16:20	code , micropython , 2026 , rp2040 eth , i2c , comunication
• lamaPLC: RP2040_ETH_Modul: MLX90614 simple	2026/05/12 17:06	code , micropython , 2026 , rp2040 eth , i2c , communication , mlx90614
• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data	2026/05/12 21:06	code , micropython , 2026 , rp2040 eth , bme680 , i2c , sensor , communication

- [lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data and store in Modbus input registers](#)
2026/05/12
18:58
code, micropython, 2026, rp2040 eth, bme680, i2c, sensor, communication
- [LamaPLC: SC16IS750 / SC16IS752: One or two serial \(UART\) ports from microcontroller via I²C or SPI communication](#)
2026/04/23
21:52
cjmcu-750, cjmcu-752, cjmcu, nxp, sc16is750, sc16is752, uart, serial, i2c, spi, modul, converter, arduino, code
- [LamaPLC: SGP Sensirion TVOC/VOC sensors with I²C communication](#)
2026/04/15
19:41
sgp30, sgp40, sgp41, sensirion, gas-sensor, i2c, communication, sensor, arduino, code, eco2, voc, tvoc, indoor air quality, iaq, nox, hydrogen
- [LamaPLC: SHT Sensirion Temperature/humidity sensor with I²C communication](#)
2026/04/23
21:52
sht20, sht21, sht25, sht30, sht31, sht35, sht40, gy21, temperature, humidity, i2c, communication, sensor, arduino, code
- [lamaPLC: Signal level converters](#)
2026/02/14
23:47
pca9306, i2c, voltage, level, converter
- [lamaPLC: st756x display drivers](#)
2026/05/20
16:17
display, driver, i2c, spi, lcd, cog, oled, st7565, st7567, gm12864, gm12864-59n, gm12864-03a, gm12864-01a, gme12864-41
- [lamaPLC: TCA9548A \(HW617\); Low-Voltage 8-Channel I²C Switch Module](#)
2026/02/14
23:51
tca9548a, hw617, i2c, switch, communication, expansion board, arduino
- [lamaPLC: TM1637 7-segment display](#)
2026/02/14
18:26
i2c, 7-segment display, display, tm1637, arduino
- [LamaPLC: TOFnnnC STMicroelectronics Time-of-Flight \(ToF\) sensors with I²C communication](#)
2026/04/23
21:52
tof050c, vl6180, tof200c, vl53l0x, tof400c, vl53l1x, stmicroelectronics, time-of-flight, tof, i2c, communication, sensor, arduino, code
- [LamaPLC: VL53Lnn STMicroelectronics time-of-flight \(ToF\) laser-ranging sensors with I²C communication](#)
2026/04/23
21:52
vl53l0x, vl53l1x, vl53l0 1xv2, gy-530, time-of-flight, tof, laser-ranging, i2c, communication, sensor, arduino, code
- [LamaPLC: VL6180X STMicroelectronics Time-of-Flight \(ToF\) sensor with I²C communication](#)
2026/04/23
21:52
vl6180x, stmicroelectronics, time-of-flight, tof, i2c, communication, sensor, arduino, code
- [lamaPLC: XGZP68xx: Silicon Pressure Sensors/Module](#)
2026/05/15
15:17
communication, i2c, sensor, modul, pressure, cfsensor, xgzp68xx, xgzp6810d, xgzp6857d, xgzp6859d, xgzp6887d, xgzp6897d, xgzp6899a, piezoresistive, capacitive
- [Magnetic angle sensors](#)
2026/04/23
21:52
magnetic angle sensor, magnetic flux, sensor, spi, i2c, pwm, communication, modul, as5047p, as5600, mt6701, mt6816, mt6835, tle5012b, amr, gmr, tmr, anisotropic magnetoresistive
- [SSH1106/SSD1306 OLED Display with I²C communication](#)
2026/02/14
18:27
i2c, oled, display, ssd1306, sh1106, ssh1106, arduino, cmos

[DHT11](#), [DHT20](#), [DHT22](#), [temperature](#), [humidity](#), [pressure](#), [sensor](#), [1-wire](#), [arduino](#), [code](#)

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