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
T H 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
T H 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%	I²C default addr.: **0x38**	-
T H 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 system. For more details, see here:

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

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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();
```

```cpp
  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

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• lamaPLC Communication: 1-Wire	2025/05/31 21:56	1-wire, communication, bus, microlan, i2c, uart, usart, ds18b20
• lamaPLC Communication: IEC 61850 basic	2025/09/23 21:03	1-wire, communication, bus, xml, iec 61850, iec, ethernet, scl, goose, ied
• lamaPLC Communication: I²C	2025/09/23 19:25	i2c, i c, smbus, philips, bus, communication, arduino
• LamaPLC: AHT10 Modul	2026/03/21 19:20	communication, i2c, temperature, humidity, sensor, aht, aht 10, modul
• LamaPLC: AHT20 / BMP280 Modul	2026/02/15 20:33	bmp280, aht20, adafruit, temperature, humidity, pressure, sensor, arduino, code, i2c
• LamaPLC: APDS - Avago ALS and proximity detection sensors with I²C communication	2026/02/14 22:24	avago, apds-9900, apds-9930, apds-9960, als, proximity, detection, gesture recognition, gesture, i2c, communication, sensor, arduino, code
• lamaPLC: AS5600 Magnetic Induction Angle Measurement Sensor Module	2026/03/28 22:07	communication, i2c, as5600, as-5600, magnetic, induction, angle, sensor
• LamaPLC: BMP/BME Bosch Temperature/Humidity/Pressure sensors with I²C communication	2026/02/15 20:40	bme280, bme680, bmp180, bmp280, hw-611, hw611, bosch, temperature, humidity, pressure, sensor, arduino, i2c, communication, cjmcu
• LamaPLC: CJMCU-219/INA-219 breakout board/IC with I²C communication	2026/02/14 23:37	cjmcu-219, ina-219, ina219, breakout board, i2c, communication, sensor, voltage, current, arduino, code, cjmcu
• LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication	2026/02/14 22:40	cjmcu-3216, cjmcu, ap-3216, ap3216, ambient light, proximity, sensor, arduino, code, i2c, communication

• lamaPLC: CJMCU-811 CCS811 Gas Sensor (VOCs TVOC CO2)	2026/03/21 22:25	cjmcu-811, ccs811, gas, sensor, vocs, tvoc, eco2, co2, arduino, air quality metal oxide, mox, i2c
• LamaPLC: D6T Omron Non-Contact Thermal Sensors with I²C communication	2026/02/14 18:19	d6t, d6t-32l, d6t-44l, d6t-8l, d6t-1a, omron, non-contact, thermal, sensor, i2c, arduino, code
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• LamaPLC: DPS Infineon Temperature/Pressure sensors with I2C communication	2026/02/14 18:11	dps310, infineon, temperature, pressure, sensor, arduino, i2c, communication, code
• lamaPLC: DS18B20 1-Wire Digital Thermometer	2026/02/15 20:44	ds18b20, sensor, 1-wire, communication, arduino, thermometer, parasitic mode
• lamaPLC: Energy, power, current, and voltage	2025/05/31 21:32	i2c, i c, communication, arduino, energy, power, current, sensor, ina226
• LamaPLC: ENS ScioSense Multi-gas sensors with I²C communication	2026/02/14 19:29	ens160, sciosense, gas-quality, i2c, communication, sensor, arduino, code, eco_2, tvoc, aqi, indoor air quality, iaq, co_2, voc
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• LamaPLC: Gas sensors	2023/07/01 15:29	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	2026/03/22 00:26	stmicroelectronics, lsm303dlhc, i2c, lsm303, sensor, gy-511, 6dof, pololu, module, arduino
• LamaPLC: GY-9250 MPU-9250/6500 9-axis Attitude Sensor Board	2026/02/14 22:45	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	2026/02/14 22:09	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	2026/02/14 17:26	i2c, 7-segment display, display, ht16k33, arduino

• LamaPLC: HTU TE Connectivity temperature/humidity sensors with I²C communication	2026/02/14 21:54	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	2026/03/28 18:02	i2c, i c, communication, arduino, energy, power, current, monitor, sensor, ina219, ina226, ina228, ina237, ina238, ina260, ina3221, ina
• lamaPLC: INA226 - current/voltage/power monitor with I²C communication	2026/02/14 23:58	i2c, i c, communication, arduino, energy, power, current, monitor, sensor, ina226, ina219, ina
• lamaPLC: LCD 1602/2004 with I²C communication	2026/02/14 17:27	communication, i2c, display, lcd, 1602, 2004, hd44780, pcf8574, pcf8574t, pcf8574at, arduino
• LamaPLC: MAX30100/MAX30102 Heart Rate Click Sensor Module	2026/02/14 23:38	max30102, max30100, heart rate click, sensor, communication, i2c, arduino, code
• lamaPLC: MCP23017 / MCP23S17 16-Bit I/O Expander with Serial Interface I²C / SPI	2026/02/14 22:52	communication, i2c, mcp23017, mcp23s17, spi, i o expander, serial, cjmcu-2317, cjmcu
• LamaPLC: Pixart PAJ7620U2 Gesture recognition sensors/module with I²C communication	2026/02/14 22:23	paj7620u2, gy-paj7620, pixart, gesture recognition, i2c, communication, sensor, arduino, code
• LamaPLC: SC16IS750 / SC16IS752: One or two serial (UART) ports from microcontroller via I²C or SPI communication	2026/02/14 22:53	cjmcu-750, cjmcu-752, cjmcu, nxp, sc16is750, sc16is752, uart, serial, i2c, spi, modul, converter, arduino, code
• LamaPLC: SGP Sensirion Gas-sensors with I²C communication	2026/02/15 20:27	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	2026/02/15 20:29	sht20, sht21, sht25, sht30, sht31, sht35, sht40, gy21, temperature, humidity, i2c, communication, sensor, arduino, code
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• lamaPLC: TM1637 7-segment display	2026/02/14 17:26	i2c, 7-segment display, display, tm1637, arduino
• LamaPLC: TOFnnnC STMicroelectronics Time-of-Flight (ToF) sensors with I²C communication	2026/02/14 22:22	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	2026/02/14 22:21	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

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  vl6180x, stmicroelectronics, time-of-flight, tof, i2c, communication, sensor, arduino, code

- Magnetic angle sensors

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  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

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  i2c, oled, display, ssd1306, sh1106, ssh1106, arduino, cmos

DHT11, DHT20, DHT22, temperature, humidity, pressure, sensor, 1-wire, arduino, code

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