

LamaPLC: HDC Texas Instruments Temperature/humidity sensors with I²C communication

The Texas Instruments HDC1080 is a low-power, high-accuracy, factory-calibrated digital humidity and temperature sensor that communicates via an I²C interface.



Key Features

- **High Accuracy:** Provides a typical relative humidity accuracy of $\pm 2\%$ and a typical temperature accuracy of $\pm 0.2^\circ\text{C}$.
- **Low Power Consumption:** Features an ultra-low 100 nA sleep mode current, making it ideal for battery-powered or IoT applications.
- **Integrated Sensing:** Measures both relative humidity and temperature with an integrated sensor element, reducing complexity and footprint.
- **Wide Operating Range & Voltage:**
 - **Supply Voltage:** Operates over a wide range from 2.7 V to 5.5 V.
 - **Temperature Range:** Functional from -40°C to $+125^\circ\text{C}$.
 - **Humidity Range:** Measures 0% to 100% relative humidity.
- **Factory Calibrated:** The sensors are factory-calibrated, ensuring reliable, accurate measurements without requiring user calibration.
- **Digital Interface:** Uses the I²C protocol for easy integration with microcontrollers such as Arduino or ESP32.
- **High Resolution:** Offers 14-bit measurement resolution for precise data acquisition.
- **Stability:** Exhibits excellent stability, particularly in high-humidity environments, with less than 0.5% per year typical drift.
- **On-chip Heater:** Includes a built-in heater that can be used to burn off condensation, enhancing reliability in challenging environmental conditions.

Similar sensors

The **SHT21**, **HTU21**, **Si7021**, **GY-21**, **GY-213V**, and **HDC1080** are very similar digital humidity and temperature sensor chips from different manufacturers (Sensirion, Measurement Specialties, and Silicon Labs, respectively), while the GY-21 is a generic breakout board that uses one of these chips. They are largely interchangeable in hardware and software for most general-purpose applications.



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HDC1080 Modul

The **HDC1080 module** (often seen as the **GY-213V-HDC1080** or **CJMCU-1080**) is a breakout board that integrates the Texas Instruments HDC1080 low-power, high-accuracy digital humidity and temperature sensor. It simplifies interfacing with microcontrollers via the I²C bus.



- **Integrated Sensing:** The module measures both relative humidity (0-100%) and temperature (-40°C to +125°C) on a single chip.
- **High Accuracy:** It delivers high-precision measurements with a typical accuracy of $\pm 2\%$ RH and $\pm 0.2^\circ\text{C}$.
- **Wide Operating Voltage:** The board typically supports a 2.7V to 5.5V DC supply range, making it compatible with both 3.3V and 5V systems such as Arduino and Raspberry Pi.
- **Ultra-Low Power:** It features a very low 100 nA sleep mode current, suitable for battery-operated devices.
- **I²C Interface:** Communication is handled via the standard I²C (IIC) protocol, using only SDA and SCL, simplifying wiring to a microcontroller.

Arduino & HDC1080 Modul

- SCL: A5
- GND: GND
- SDA: A4
- Vdd: 5V

Arduino code

To interface the HDC1080 module with an Arduino, the most popular and feature-rich option is the **ClosedCube HDC1080** library.

This sketch initializes the sensor and prints temperature and humidity readings to the Serial Monitor every 3 seconds.

```
#include <Wire.h>
#include "ClosedCube_HDC1080.h"

ClosedCube_HDC1080 hdc1080;

void setup() {
  Serial.begin(9600);

  // Standard I2C address for HDC1080 is 0x40
  hdc1080.begin(0x40);

  Serial.print("Manufacturer ID: 0x");
  Serial.println(hdc1080.readManufacturerId(), HEX); // Should be 0x5449
}
```

```

void loop() {
  // Read temperature and humidity
  float temp = hdc1080.readTemperature();
  float humidity = hdc1080.readHumidity();

  Serial.print("T=");
  Serial.print(temp);
  Serial.print("C, RH=");
  Serial.print(humidity);
  Serial.println("%");

  delay(3000); // Wait for 3 seconds
}

```

I²C topics on lamaPLC

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• 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
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• 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
• 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

- [LamaPLC: CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication](#)

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• 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 I ² C communication	2026/04/23 21:52	i2c, i c, communication, arduino, energy, power, current, monitor, sensor, ina226, ina219, ina
• lamaPLC: LCD 1602/2004 with I ² C communication	2026/02/14 18:27	communication, i2c, display, lcd, 1602, 2004, hd44780, pcf8574, pcf8574t, pcf8574at, arduino
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• lamaPLC: MCP23017 / MCP23S17 16-Bit I/O Expander with Serial Interface I ² C / SPI	2026/04/23 21:52	communication, i2c, mcp23017, mcp23s17, spi, i o expander, serial, cjmcu-2317, cjmcu
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• lamaPLC: PCF857x I/O Expander chip/modul with I ² C 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 I ² C communication	2026/04/23 21:52	paj7620u2, gy-paj7620, pixart, gesture recognition, i2c, communication, sensor, arduino, code
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• lamaPLC: RP2040_ETH_Modul: Read BME 680/688 sensor data	2026/05/12 21:06	code, micropython, 2026, rp2040 eth, bme680, i2c, sensor, communication
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