# DHT22 Precision Digital Temperature and Humidity Sensor Module

The **DHT22 Precision Digital Temperature and Humidity Sensor Module** is one of the most reliable and widely used sensors in the world of electronics, IoT, and automation projects. Known for its **accuracy, stability, and wide measurement range**, this sensor is the perfect choice for developers, hobbyists, students, and engineers who need precise climate data for their projects. Whether you are working on a weather station, an IoT smart home system, or an environmental monitoring device, the DHT22 is built to deliver dependable results.

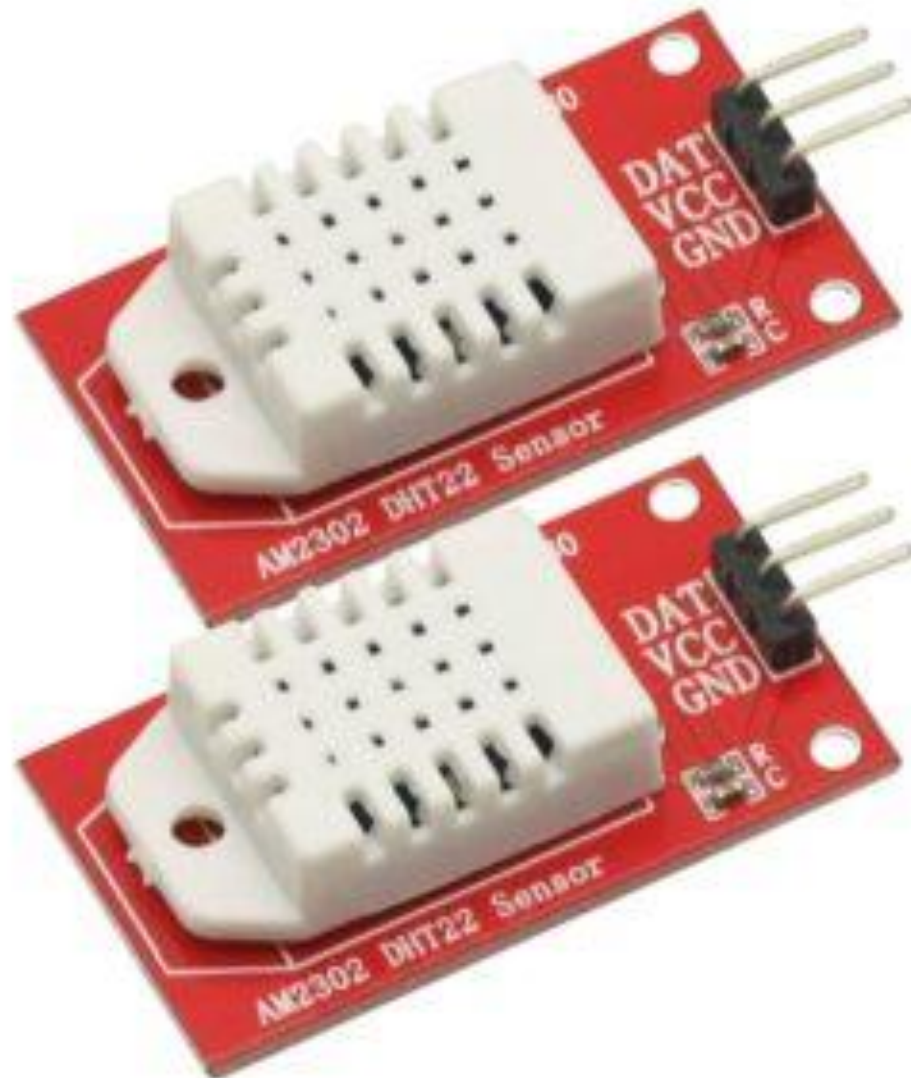## Key Features of the DHT22 Sensor Module

- 🌡 ☐ **Accurate Temperature Measurement**:
  Measures temperatures from **-40°C to +80°C** with an accuracy of ±0.5°C. This makes it ideal for indoor and outdoor climate monitoring applications.

- ⬤ **Reliable Humidity Detection**:
  Detects relative humidity levels between **0% and 100% RH** with an accuracy of ±2–5%, ensuring stable and repeatable readings.

- ⚡ **Digital Output**:
  Provides calibrated digital signals directly via a single data pin, reducing the need for external components or complex analog-to-digital conversion.

- ⚡ **Low Power Consumption**:
  Designed for low-power operation, making it suitable for battery-powered and energy-efficient IoT systems.

- 🔧 **Easy to Use**:
  The DHT22 module is compatible with popular microcontrollers such as **Arduino, ESP8266, ESP32, Raspberry Pi, and STM32**, allowing seamless integration into various projects.
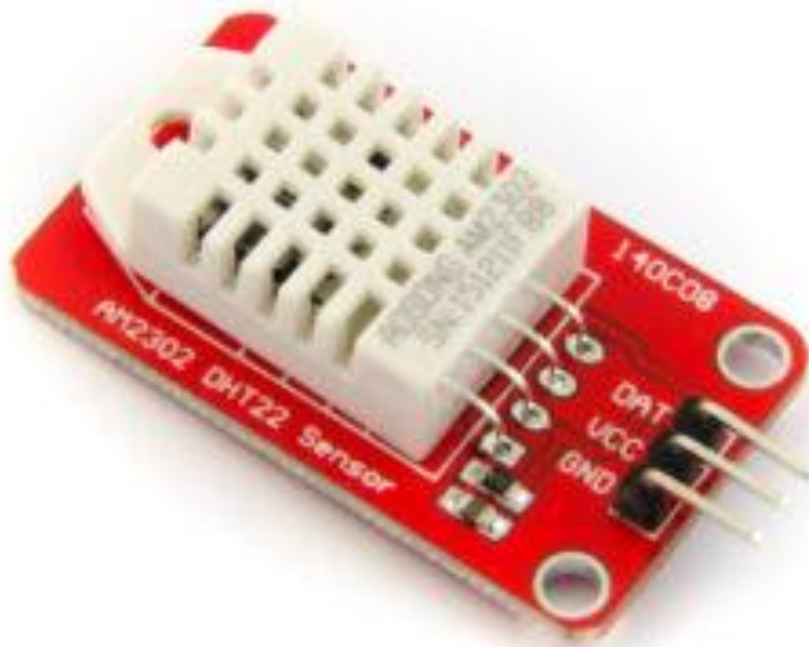
Technical Specifications

- **Operating Voltage**: 3.3V – 5.5V
- **Temperature Range**: -40°C to +80°C
- **Temperature Accuracy**: ±0.5°C
- **Humidity Range**: 0% – 100% RH
- **Humidity Accuracy**: ±2–5% RH
- **Sampling Period**: 2 seconds
- **Signal Output**: Digital (single-wire serial interface)

- **Dimensions**: Compact and lightweight for easy mounting

Applications of the DHT22 Sensor Module

Thanks to its precision and versatility, the **DHT22 digital temperature and humidity sensor** can be used in a wide range of real-world applications:

1. **Weather Stations**
   Build your own DIY weather monitoring system to track temperature and humidity levels in real-time.
2. **Smart Home Systems**
   Automate air conditioning, humidifiers, and ventilation systems by integrating the sensor into smart home setups.

3. **IoT Devices**
   Perfect for **Internet of Things projects** that require environmental sensing, such as greenhouse monitoring or data logging.
4. **Industrial Applications**
   Useful in factories, warehouses, and cold storage facilities where climate control is essential.
5. **Academic and DIY Projects**
   An excellent learning tool for students, hobbyists, and educators exploring electronics and environmental science.

VCC —— GND

Data ←—— —— NC

GND ——

VCC ←——

Data ←——
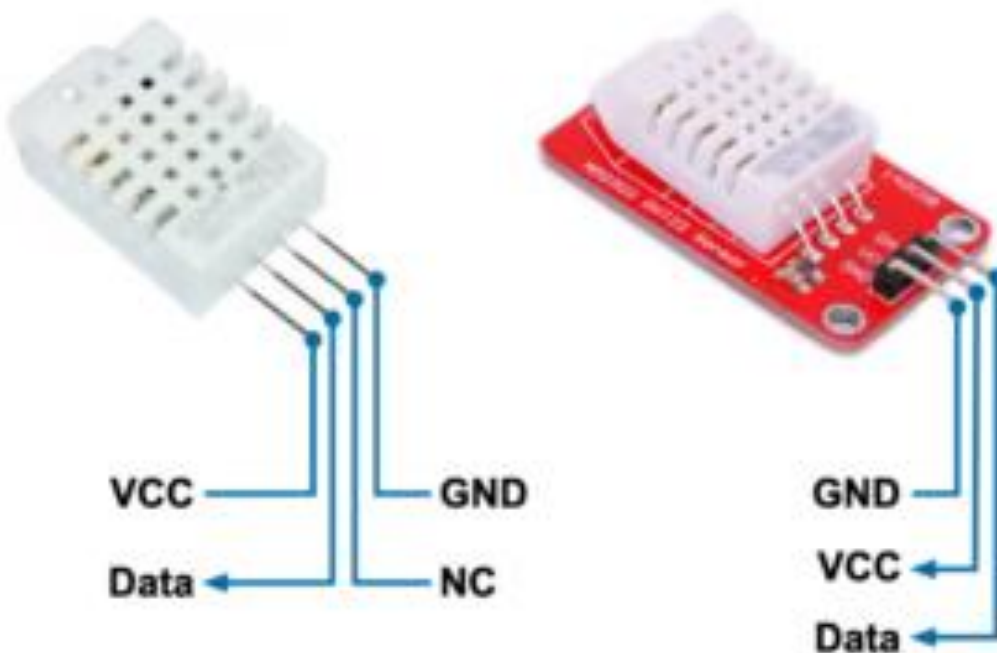
Why Choose the DHT22 Over Other Sensors?

Compared to its predecessor **DHT11**, the **DHT22** offers a **wider measurement range, higher accuracy, and better resolution**. While DHT11 is good for basic projects, the DHT22 is the go-

to choice for applications that require **precision and reliability**. This makes it a preferred sensor among IoT developers and professional engineers alike.

Easy Integration with Arduino and Raspberry Pi

The DHT22 sensor works seamlessly with popular development boards. Libraries are readily available for platforms like **Arduino IDE, MicroPython, and Raspberry Pi Python**, allowing beginners and professionals to start using the sensor with minimal setup time. With just a few lines of code, you can begin reading **temperature and humidity data** and displaying it on an LCD, sending it to the cloud, or triggering automated actions.