

# Sensor: DHT11 - Digital Temperature and Humidity Sensor

## Introduction:

The DHT11 is a low-cost digital sensor capable of measuring temperature and humidity. It is commonly used in various applications, including home automation, weather stations, and environmental monitoring. The sensor provides accurate and reliable data in a compact package, making it a popular choice for hobbyists and professionals alike.

## Key Features:

- Temperature measurement range: 0°C to 50°C with an accuracy of  $\pm 2^\circ\text{C}$ .
- Humidity measurement range: 20% to 80% RH with an accuracy of  $\pm 5\%$  RH.
- Digital output for easy interfacing with microcontrollers like Raspberry Pi.
- Use Case: Environmental Monitoring

## Scenario:

Imagine you want to monitor the temperature and humidity levels in a greenhouse to ensure optimal conditions for plant growth. The DHT11 sensor can be a valuable component in your greenhouse monitoring system.

## Implementation:

- Connect the DHT11 sensor to a Raspberry Pi using a GPIO pin.
- Use the Adafruit DHT library to read data from the sensor.
- Log the temperature and humidity data to a CSV file at regular intervals.
- Analyze the collected data to make informed decisions about greenhouse conditions, such as controlling fans or adjusting watering schedules.

## Benefits:

- Affordable and readily available.
- Easy to interface with Raspberry Pi or other microcontrollers.
- Provides real-time data for decision-making.

Helps maintain optimal environmental conditions for plant growth, leading to healthier and more productive crops.

## Conclusion:

The DHT11 sensor is a cost-effective solution for monitoring temperature and humidity in various applications, including greenhouse management. Its simplicity and accuracy make it a valuable tool for projects requiring environmental data collection and control.