System Overview

**DHT11 and DS18B20 Sensor Integration with ESP8266 and FlowFuse**

# Brief Description

## 2.1 DHT11 Sensor

The DHT11 sensor measures both temperature and relative humidity. It is suitable for general indoor monitoring and provides reliable data for baseline environmental conditions. In this system, the DHT11 is used to check for humidity above 70% and temperature over 20°C, both of which trigger warning alerts. These values are displayed on real-time gauges within the FlowFuse dashboard and are validated using logic blocks to filter out erroneous or out-of-range data.

## 2.2 DS18B20 Sensor

The Dallas DS18B20 sensor is a high-precision digital temperature sensor using the OneWire protocol. It operates across a wide range from -55°C to +125°C, making it ideal for environments where accurate thermal control is critical. It complements the DHT11 by providing more accurate temperature readings and acts as a second layer of verification. Its output is monitored every 3 seconds and triggers alerts if the temperature exceeds 20°C.

# 3. System Integration

Both sensors are connected to the ESP8266 microcontroller, which forms the core of the IoT Node Layer. The collected data is processed through FlowFuse logic flows. Valid readings are sent to a dashboard with visual indicators, simulation sliders, and notification systems. Warnings such as '⚠️ Temperature exceeds 20°C!' or '⚠️ Humidity exceeds 70%!' are triggered based on threshold breaches. Simulated input allows for testing system responsiveness without requiring real-world changes.

# 4. Cloud and Alert Flow

Sensor values are pushed to the cloud using MQTT protocols, enabling remote monitoring, logging, and integration with third-party services. The system architecture, as shown in the project’s flow diagram, highlights a seamless path from physical sensors to cloud dashboards and end-user notifications.

# 5. Conclusion

By combining the wide environmental coverage of the DHT11 with the precision of the DS18B20, this dual-sensor system ensures robust, real-time climate monitoring. It is highly suitable for early warning systems in sensitive indoor applications and provides clear feedback through a user-friendly dashboard interface integrated into a cloud-connected architecture.

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