IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, May 2025
Impact Factor: 7.67

Smart Weather Monitoring System using Node MCU

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Abstract: *The demand for accurate and real-time environmental data is growing rapidly due to its vital importance in areas such as agriculture, disaster management, urban planning, and climate research. Traditional weather monitoring systems, while effective, are often expensive, bulky, and lack the capability for real-time data transmission and remote accessibility. With the rise of the Internet of Things (IoT), it has become possible to design more compact, affordable, and efficient systems for environmental monitoring.*

This paper presents the design and development of a Smart Weather Monitoring System based on the NodeMCU ESP8266 microcontroller, which features integrated Wi-Fi capabilities. The system employs a range of sensors including the DHT11 for temperature and humidity, the BMP180 for atmospheric pressure, and a rain sensor to detect precipitation levels. These sensors continuously collect environmental data which is then transmitted over Wi-Fi to a cloud-based platform (ThingSpeak), where it can be accessed in real time through a web interface..

Keywords: real-time environmental

DOI: 10.48175/IJARSCT-26306