

# WIRELESS ECG MONITORING SYSTEM

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**Abstract** - In today's healthcare environment, continuous monitoring of a patient's heart activity is crucial for early diagnosis and timely medical intervention. This paper presents a Wireless ECG Monitoring System that enables real-time ECG data acquisition and transmission using IoT technology. The system consists of an AD8232 ECG sensor, an ESP32 microcontroller, and electrodes for signal acquisition. The collected data is processed using Arduino and displayed on Ubidots, allowing remote monitoring of heart health. This system provides an efficient, cost-effective, and wireless alternative to traditional ECG machines.

By implementing this system, healthcare professionals can access real-time ECG data, ensuring timely diagnosis and intervention.

## Why This Project:

The Wireless ECG Monitoring System enables real-time, remote heart monitoring, helping detect cardiac issues early. It is portable, cost-effective, and IoT-enabled, allowing doctors to access ECG data remotely via Ubidots. This system improves patient comfort, emergency response, and accessibility, especially in rural areas.

## 1. LITERATURE SURVEY:

### 1. IoT Based ECG Monitoring System (2022)

Sharma and Lamba (2022) discuss the design of an IoT-based ECG monitoring framework that enables real-time data acquisition and transmission. The system leverages cloud-based analytics for continuous patient monitoring, thus improving diagnostic accuracy and patient care.

### 2. IoT Based ECG Using AD8232 and ESP32 (2022)

Bhattarai et al. (2022) present a wireless ECG monitoring solution using an ESP32 microcontroller and AD8232 ECG sensor. Their work highlights how IoT integration simplifies remote health monitoring and improves the accessibility of ECG data in real-time.

## 2. INTRODUCTION:

With advancements in wireless technology, ECG monitoring has evolved beyond hospital settings. The Wireless ECG Monitoring System allows patients to monitor their heart health remotely, reducing hospital visits and enabling early detection of cardiac abnormalities.

This system utilizes AD8232 for ECG signal acquisition, ESP32 for wireless data transmission, and Ubidots for cloud-based visualization.

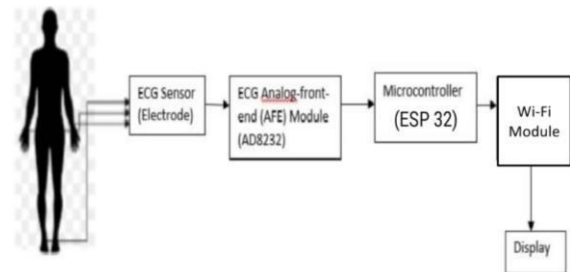


Fig 1: Block Diagram

## 3. WORKING

When the electrodes are placed on the patient's body, they capture the ECG signals, which are then processed by the AD8232 module. The processed signal is sent to the ESP32 microcontroller, which transmits the ECG data wirelessly to the Ubidots cloud platform via Wi-Fi. The data is displayed on Ubidots in the form of waveforms, allowing remote monitoring of the patient's heart activity. This system enables healthcare professionals to analyze ECG signals in real time, ensuring better cardiac health management.

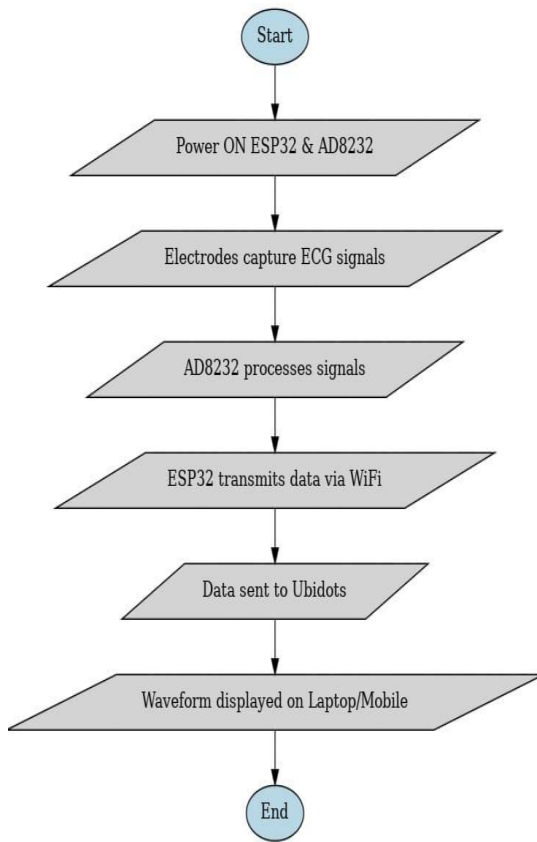
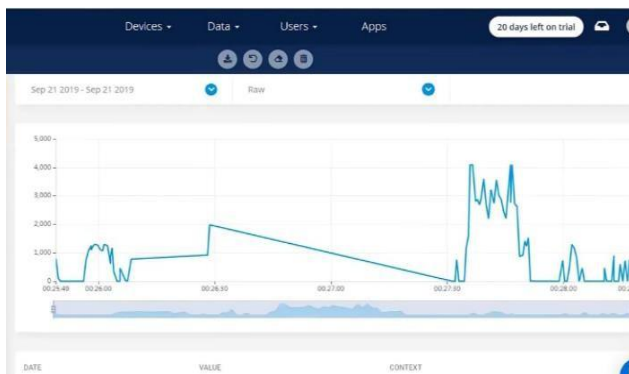


Fig 2: FlowChart

output:



## CONCLUSION

The Wireless ECG Monitoring System is a cost-effective and efficient solution for real-time heart monitoring. It enables remote access to ECG data, improving patient care and reducing hospital dependency. By integrating IoT technology, this system bridges the gap between patients and healthcare providers, ensuring better cardiac health management.

## FUTURE SCOPE

1. AI-based ECG Analysis – AI will work like a smart doctor, checking ECG signals and detecting heart problems early. It will alert doctors if something is wrong.
2. Bluetooth Integration - Bluetooth will allow ECG data to be sent to a phone without Wi-Fi, making it useful in places with no internet.
3. Mobile App Development – A mobile app will show ECG data in real time and send alerts if any heart issue is detected. It will also save past records.

## REFERENCES

1. G. D. Sharma and P. S. K. Lamba, "IoT based ECG Monitoring System," IJISRT, vol. 7, no. 5, May 2022.
2. C. Bhattarai et al., "IoT Based ECG Using AD8232 and ESP32," Nepal J. Sci. Technol., vol. 21, no. 2, 2022.