

## ABSTRACT

The number of implementations of health monitoring that can be accessed remotely based on Internet of Things (IoT) are still relatively low, especially with pandemic conditions making health monitoring difficult. For this reason a telemedicine system is needed which allows us to do self check up and the result can be consulted with a doctor.

An electrocardiogram (ECG) embedded in the telemedicine system allows the users to record heart rate by themselves. This device uses the AD8232 sensor as a heart rate sensor and the ESP32 as a microcontroller for data processing. The data obtained are sent to the smartphone via Bluetooth Low Energy (BLE) connection. To ensure the data are secure, this system is equipped with AES 256 bit encryption with a static key.

The accuracy of the device for recording heart rate reaches 98.94% with respect to the Omron digital tensimeter which also has a heart rate monitoring capability. With the BLE communication, this device has a delay of 16.29ms for the encrypted data and 16.19ms for the unencrypted data. Throughput on encrypted data is 3439.46Bytes/s and on unencrypted data is 2485.58Bytes/s which make this device does not have packet loss. This device also can last up to 6.5hours from a fully charged battery.

**Key word:** Telemedicine, Internet of Things, Arrythmia, Electrocardiogram, AES Encryption