

# Rancang Bangun Gelang Pulse Oximeter Berbasis Mikrokontroler Seeduo = Design of Pulse Oximeter Based on Seeduo Microcontroller

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## Abstrak

Meningkatnya kasus positif COVID-19 membuat pentingnya memantau nilai saturasi oksigen di dalam darah (SPO<sub>2</sub>). Tujuannya agar mencegah terjadinya silent hypoxia yang dapat menurunkan kadar oksigen dalam darah tanpa disertai gejala. Silent hypoxia menyebabkan kerusakan jaringan pada tubuh serta dapat memicu terjadinya komplikasi seperti gagal nafas atau kematian mendadak. Pada umumnya alat pulse oximeter konvensional berbentuk klip yang dijepit pada jari untuk mengukur nilai SPO<sub>2</sub> dan detak jantung (HR). Pada penelitian ini bertujuan untuk merancang alat pulse oximeter berbentuk gelang untuk membantu mempermudah pemantauan nilai SPO<sub>2</sub> dan HR. Pada rancangan ini menggunakan mikrokontroler seeduo xiao, modul sensor max 30100, OLED display dan BLE HM-11. Metode pengambilan data pada 10 relawan dengan menggunakan pulse oximeter konvensional sebagai referensi dan prototipe untuk mengukur kadar SPO<sub>2</sub> dan HR. Dilakukan pengambilan data sebanyak 10 kali pada masing-masing relawan. Hasil dari rata-rata pengukuran pada prototipe dibandingkan dengan pulse oximeter konvensional didapatkan keakurasian pengukuran rata-rata SPO<sub>2</sub> 98.8 % dan HR 97% . Sehingga gelang pulse oximeter dapat melakukan pengambilan data akurasi yang cukup baik.

.....The increase in positive cases of COVID-19 makes it important to monitor the value of oxygen saturation in the blood (SPO<sub>2</sub>). The goal is to prevent silent hypoxia which can reduce oxygen levels in the blood without being accompanied by symptoms. Silent hypoxia causes tissue damage in the body and can lead to complications such as respiratory failure or sudden death. In general, the conventional pulse oximeter is in the form of a clamped clip on the finger to measure the SPO<sub>2</sub> value and heart rate (HR). This research aims to design a pulse oximeter in the form of a bracelet to help monitor of SPO<sub>2</sub> and HR values. This design uses a seeduo xiao microcontroller, max 30100 sensor module, OLED display and BLE HM-11. Methods of collecting data on ten volunteers using a conventional pulse oximeter as a reference and a prototype to measure SPO<sub>2</sub> and HR levels. Data were collected ten times for each volunteer. The results of the average measurements on the prototype compared with conventional pulse oximeters obtained an average measurement accuracy of 98.8% SPO<sub>2</sub> and 97% HR so that the pulse oximeter bracelet can perform data collection with fairly good accuracy.