

RANCANG BANGUN ALAT STERILISASI PERALATAN MEDIS MENGGUNAKAN SINAR UV-C BERBASIS IoT

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ABSTRAK

Sterilisasi peralatan medis penting untuk mencegah infeksi silang akibat mikroorganisme. Metode konvensional memiliki keterbatasan waktu dan sarana, sehingga penelitian ini merancang alat sterilisasi peralatan medis non-elektronik menggunakan sinar ultraviolet tipe C (UV-C) berbasis *Internet of Things* (IoT). Sistem menggunakan mikrokontroler ESP32 yang terintegrasi dengan sensor GUV-A-S12SD, TCS34725, DHT11, modul RTC, dan *reed switch*, serta dapat dipantau secara *real-time* melalui aplikasi Blynk. Hasil pengujian menunjukkan alat bekerja sesuai rancangan, proses sterilisasi berjalan otomatis berdasarkan waktu penyinaran, dan keberadaan sinar UV-C terdeteksi dengan baik. Alat ini dapat menjadi solusi alternatif yang praktis dan aman untuk sterilisasi peralatan medis di fasilitas kesehatan dengan keterbatasan sarana.

Sterilisasi, UV-C, *Internet of Things* (IoT), ESP32, GUV-A-S12SD, TCS34725, DHT11, RTC.

DESIGN AND BUILD MEDICAL EQUIPMENT STERILIZERS USING IO-BASED UV-C LIGHT

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ABSTRACT

Medical equipment sterilization is essential to prevent cross-infection caused by microorganisms. Conventional methods have limitations in time and facilities; therefore, this study designs a non-electronic medical equipment sterilization device using ultraviolet type C (UV-C) based on the Internet of Things (IoT). The system employs an ESP32 microcontroller integrated with GUVA-S12SD, TCS34725, DHT11 sensors, an RTC module, and a reed switch, and can be monitored in real time via the Blynk application. Experimental results show that the device operates as designed, with the sterilization process running automatically based on the exposure time and UV-C presence being properly detected. This device can serve as a practical and safe alternative for medical equipment sterilization in healthcare facilities with limited resources.

Sterilization, UV-C, Internet of Things (IoT), ESP32, GUVA S12SD, TCS34725, DHT11, RTC