

Rancang Bangun Sistem Pemantauan Kondisi pada Stairlift Berbasis Internet of Things (IoT) untuk Akuisisi Data Fisis Menggunakan Multi Sensor = Design of Condition Monitoring System on Stairlift Based on Internet of Things (IoT) for Physical Data Acquisition using Multi Sensors.

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20504885&lokasi=lokal>

Abstrak

Pada penelitian ini membahas sistem pemantauan pada stairlift menggunakan internet of things (IoT), di mana sistem tertanam dalam fisik stairlift menggunakan sensor yang dipasang pada komponen stairlift dan kemudian diintegrasikan ke dalam platform IoT cloud (thingspeak) melalui jaringan internet. Akuisisi data fisis multi-sensor dapat berjalan, banyak informasi yang dapat diakses seperti: temperature motor, kecepatan, beban penumpang, konsumsi daya, getaran bearing dan getaran motor. Sistem pemantauan dapat berjalan secara real time, sehingga membuat pemantauan terpusat dan kegagalan operasi stairlift dapat dicegah sedini mungkin melalui early warning system (EWS) via Telegram. Selain itu, sistem ini dapat memberikan dukungan analisis teknis dalam mengembangkan prototype stairlift di masa mendatang. Berdasarkan analisis hasil pemantauan yang diperoleh, prototype stairlift layak dikembangkan untuk skala industri, secara operasional memenuhi ASME A18.1, ISO 10816 dan ISO 2372. Hal ini ditunjukkan dalam ujicoba variasi beban penumpang hingga maksimum 115 kg diperoleh kecepatan maksimum rata-rata <0,2 m/s, temperature motor <74,6 C, konsumsi daya <600 watt, acceleration getaran bearing <0,5 g'peak dan kecepatan getaran motor (RMS) <4,5 m/s. Namun masih dibutuhkan improvement pada sistem teknis operasional prototype stairlift diantaranya temperature motor, konsumsi daya dan kecepatan agar dapat berjalan stabil.

.....This research discusses monitoring systems on stairlift using internet of things (IoT), where the system embedded in the physical stairlift uses sensors that are mounted on the stairlift component and then integrated into the IoT cloud platform (thingspeak) via the internet network. Multi-sensor physical data acquisition can run, a lot of information that can be accessed such as: motor temperature, speed, passenger load, power consumption, bearing vibration and motor vibration. The monitoring system can run in real time, thus making centralized monitoring and failure of stairlift operations preventable as early as possible through the early warning system (EWS) via Telegram. In addition, this system can provide technical analysis support in developing stairlift prototypes in the future. Based on the analysis of the monitoring results obtained, the prototype stairlift is suitable for industrial scale development, operationally compliant with ASME A18.1, ISO 10816 and ISO 2372. This is shown in the trial of passenger load variations up to a maximum of 115 kg obtained an average maximum speed <0, 2 m/s, motor temperature <74.6C, power consumption <600 watts, bearing vibration acceleration <0.5 g'peak and motor vibration speed (RMS) <4.5 m/s. However, improvements are still needed in the operational technical system of the prototype stairlift including motor temperature, power consumption and speed so that it can run stably.