

INTISARI

EVALUASI DAN PERANCANGAN ULANG DESAIN *USER INTERFACE* PERANGKAT LUNAK KONTROL KEITHLEY 2401 SOURCEMETER PADA KARAKTERISASI ARUS-TEGANGAN SEL SURYA

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Telah dilakukan penelitian mengenai evaluasi dan perancangan ulang desain *user interface* perangkat lunak kontrol Keithley 2401 Sourcemeter untuk pengukuran karakteristik arus-tegangan (I - V) sel surya. Evaluasi *usability* awal dilakukan dengan menggunakan metode *Heuristic Evaluation*, *Cognitive Walkthrough*, *Think-aloud*, dan wawancara. Hasil evaluasi menunjukkan bahwa terdapat 17 permasalahan utama, di mana 82% di antaranya dikategorikan sebagai *major problem* atau *catastrophe* dengan *severity rating* ≥ 3 . Skor *System Usability Scale* (SUS) sebesar 43,5 mengindikasikan kategori *Not Acceptable*. Selain itu, dilakukan studi pendahuluan untuk mengeksplorasi potensi pengembangan perangkat lunak dalam memperluas fungsionalitasnya. Penelitian ini menggunakan metode *Design Thinking* untuk merancang prototipe antarmuka baru yang mengusulkan perbaikan berdasarkan prinsip *usability*. Hasil rancangan mencakup rekomendasi fitur seperti *real-time plotting*, validasi parameter otomatis, *repeat sweep*, dan *report generator* untuk meningkatkan efisiensi, fleksibilitas, dan akurasi pengukuran. Selain itu, fitur *averaging* dan *sweep mode* juga diusulkan untuk mengurangi pengaruh *noise*, memvalidasi hasil eksperimen, serta memberikan wawasan mendalam tentang stabilitas material dan fenomena histeresis. Penelitian ini diharapkan dapat menjadi referensi dalam pengembangan perangkat lunak ilmiah serupa, khususnya di bidang karakterisasi sel surya dan aplikasi penelitian lainnya.

Kata kunci: Keithley 2401, karakterisasi I - V , evaluasi *usability*, prototipe antarmuka, *System Usability Scale*, *Design Thinking*.

ABSTRACT

EVALUATION AND REDESIGN OF USER INTERFACE KEITHLEY 2401 SOURCEMETER CONTROL SOFTWARE IN CHARACTERIZATION OF CURRENT-VOLTAGE OF SOLAR CELLS

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Research has been conducted on the evaluation and redesign of the user interface of the Keithley 2401 Sourcemeter control software for current-voltage (I-V) characterization of solar cells. The initial usability evaluation was carried out using the Heuristic Evaluation, Cognitive Walkthrough, Think-Aloud, and interview methods. The evaluation results revealed 17 major issues, with 82% categorized as major problems or catastrophes, having a severity rating of ≥ 3 . The System Usability Scale (SUS) score of 43.5 indicated the Not Acceptable category. Additionally, preliminary research was conducted to explore the potential development of the software to expand its functionality. This research applied the design thinking method to design a new user interface prototype that proposed improvements based on usability principles. The prototype recommendations include features such as real-time plotting, automatic parameter validation, repeat sweep, and a report generator to enhance measurement efficiency, flexibility, and accuracy. Furthermore, features such as averaging and sweep mode were proposed to reduce noise, validate experimental results, and provide deeper insights into material stability and hysteresis phenomena. This research is expected to serve as a reference for the development of similar scientific software, particularly in the field of solar cell characterization and other research applications.

Keywords: Keithley 2401, I-V characterization, usability evaluation, prototype, System Usability Scale, Design Thinking.