ABSTRAK
RANCANG BANGUN TRAINER KIT DESAIN PENDISTRIBUSIAN BATU BARA BERBASIS HMI OMRON

(2025: xiv + 56 Halaman + 65 Daftar Gambar + 3 Daftar Tabel + 6 Lampiran)

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Laporan akhir ini membahas perancangan trainer kit simulasi distribusi batu bara berbasis sistem otomasi, dengan fokus pada integrasi antara HMI Omron NB7W-TW10B dan PLC Schneider Modicon TM221M16T. Tantangan utama proyek ini adalah perbedaan jenis port komunikasi—HMI menggunakan RS232 (DB9), sedangkan PLC menggunakan RJ45 dengan protokol Modbus RTU. Integrasi dilakukan melalui pengaturan pada setting HMI melalui perangkat lunak NB-Designer, serta pemetaan register sesuai alamat PLC.. Hasil pengujian menunjukkan komunikasi berlangsung stabil dan responsif terhadap perintah kontrol dan monitoring. Sistem mampu menjalankan simulasi distribusi batu bara dalam mode manual dan otomatis, serta menampilkan status dan grafik analog input secara real-time. Proyek ini membuktikan bahwa integrasi lintas perangkat dengan port berbeda dapat dilakukan secara efektif dalam sistem otomasi edukatif skala laboratorium.

Kata kunci: HMI, PLC, NB-Designer, Trainer kit

ABSTRACT

DESIGN AND DEVELOPMENT OF A COAL DISTRIBUTION TRAINER KIT BASED ON OMRON HMI

(2025: xiv + 56 Pages + 65 List of Figures + 3 List of Tables + 6 Attachments)

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This final report discusses the design of a coal distribution simulation trainer kit based on an automation system, focusing on the integration between an Omron NB7W-TW10B HMI and a Schneider Modicon TM221M16T PLC. The main challenge of this project is the difference in communication port types—the HMI uses RS232 (DB9), while the PLC uses RJ45 with the Modbus RTU protocol. Integration is carried out through settings in the HMI settings via the NB-Designer software, as well as register mapping according to the PLC address. Test results show that communication is stable and responsive to control and monitoring commands. The system is able to run coal distribution simulations in manual and automatic modes, and displays the status and analog input graphs in real-time. This project proves that integration across devices with different ports can be done effectively in a laboratory-scale educational automation system.

Keywords: *HMI, PLC, NB-Designer, Trainer Kit*