

SIMULASI SISTEM KONTROL BERBASIS PLC: PEMBELAJARAN BERBASIS KASUS PADA MATAKULIAH PROGRAMMABLE LOGIC CONTROLLER

ARTONO DWIJO SUTOMO

*Staf Pengajar Jurusan Fisika, FMIPA
Sekretaris Pusat Pengembangan Sistem Pembelajaran, LPP
Universitas Sebelas Maret
Jl. Ir. Sutami no. 36A Surakarta 57126*

Abstrak

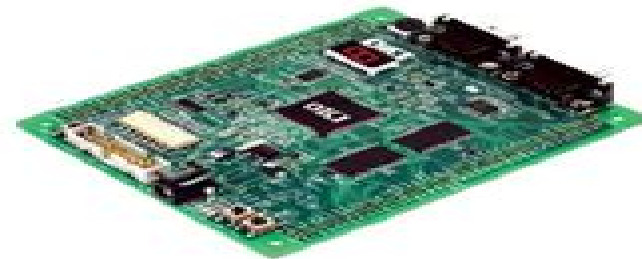
Sistem kontrol pada semua rancang bangun teknologi memegang peran yang sangat penting. Programmable Logic Controller (PLC) sebagai salah satu basis sistem kontrol sangat perlu dikenalkan pada penyediaan sumber daya manusia teknologi nuklir. Pembelajaran PLC mempunyai beberapa kendala. Kendala tersebut dapat diatasi dengan memanfaatkan simulasi berbasis komputer pribadi. Penggunaan simulasi PLC untuk pemrograman dan kasus-kasus aplikasinya dalam pembelajaran pada matakuliah Pengantar PLC di FMIPA Universitas Sebelas Maret dapat meningkatkan kemampuan dan pemahaman mahasiswa terhadap pemrograman PLC.

Kata Kunci : Pembelajaran berbasis Kasus, Programmable Logic Controller, Sistem Kontrol

PENDAHULUAN

Sistem kontrol atau kendali dalam hampir semua rancang bangun teknologi memegang peran yang sangat penting, demikian pula dalam teknologi nuklir. Sistem kontrol yang digunakan di pabrik maupun laboratorium pada berbagai macam industri barang maupun jasa menggunakan beberapa jenis basis kontroler. Komputer pribadi (personal computer : PC) merupakan salah satu kontroler yang multi fungsi yang banyak digunakan orang pada tingkat pemula. Pada industri yang kompleks digunakan kontroler-kontroler khusus yang banyak dibuat oleh industri penyedia jasa kontrol. Pada tingkat menengah kontroler yang sering digunakan menggunakan basis mikrokontroler dan programmable logic control (PLC)^[1]

Mikrokontroler biasanya dipilih dengan alasan kemudahan sisi pemrogramannya. Contoh mikrokontroler dapat dilihat pada Gambar 1 dan Gambar 2, sedangkan Gambar 3 menunjukkan salah satu aplikasi mikrokontroler dalam pembuatan robot.



Gambar 1. AME-51 Advantage Microcontroller Evaluation Kit



Gambar 2. Bluetooth Application Microcontroller

Simulasi Sistem Kontrol Berbasis Plc Pembelajaran

Frank D. Petruzella



Simulasi Sistem Kontrol Berbasis Plc Pembelajaran:

KONTROL BERBASIS KOMPUTER: SIMULASI RANGKAIAN PLC DENGAN CX-PROGRAMMER DAN

CX-DESIGNER Agus Mukhtar ,Rifki Hermana, Muchamad Malik, Aan Burhanuddin,Hisyam Ma'mun, Penulis Agus Mukhtar dkk ISBN 978 623 500 585 0 Halaman vi 85 Ukuran 15 5 x 23 Tahun 2024 sinopsis Buku Kontrol Berbasis Komputer Simulasi Rangkaian PLC dengan CX Programmer dan CX Designer adalah panduan praktis yang dirancang untuk membantu mahasiswa teknisi dan profesional di bidang otomasi industri dalam memahami dan menguasai penggunaan Programmable Logic Controller PLC untuk sistem kontrol berbasis komputer Buku ini memfokuskan pada penggunaan perangkat lunak CX Programmer dan CX Designer dari Omron untuk merancang dan mengimplementasikan rangkaian kontrol otomatis Buku ini dimulai dengan pengenalan dasar tentang PLC fungsi dan aplikasinya dalam berbagai sistem kontrol industri Penulis memberikan penjelasan yang jelas tentang bagaimana PLC digunakan untuk mengontrol proses otomatis seperti mesin dan produksi serta peranannya dalam meningkatkan efisiensi sistem industri Selanjutnya buku ini memberikan panduan lengkap untuk menggunakan CX Programmer perangkat lunak untuk pemrograman PLC Pembaca dipandu melalui langkah langkah membuat dan mengedit program PLC menggunakan ladder diagram dan instruksi logika untuk mengontrol perangkat industri Penulis juga menjelaskan bagaimana memverifikasi dan menguji program yang telah dibuat untuk memastikan sistem berfungsi dengan baik Selain itu buku ini juga membahas penggunaan CX Designer perangkat lunak untuk merancang antarmuka pengguna HMI dalam sistem PLC Pembaca diajarkan cara mendesain tampilan layar interaktif yang memungkinkan pengguna untuk memonitor dan mengontrol proses industri secara real time Dengan menggunakan simulasi dan contoh aplikasi nyata buku ini memberikan pengalaman praktis untuk merancang dan mengimplementasikan sistem kontrol berbasis PLC Buku ini sangat berguna bagi siapa saja yang ingin menguasai teknologi kontrol otomatis khususnya dalam konteks pemrograman PLC menggunakan CX Programmer dan CX Designer **SISTEM MECHATRONICS**

ENGINEERING DI ERA REVOLUSI INDUSTRI 4.0 Ikhwan Taufik, S.Pd., M.Eng, Buku ini berisi pengetahuan umum tentang teknik Mekatronika Mechatronics Engineering Buku ini diawali dengan pembahasan tentang penerapan mekatronika dasar elektronika dan elektronika digital sensor transducer Programmable Logic Control PLC dan juga pembahasan mengenai Robotics System Tentunya buku ini juga dilengkapi dengan soalsoal uji kompetensi yang diharapkan bisa mengukur pemahaman pembaca terkait materi yang ada di dalam buku ini **Sistem Kontrol Mesin-mesin Pengelolaan Sampah Rumah Tangga Menggunakan Metode Human Machine Interface** Pawenary,Dwi

Listiawati,Hendri,2024-10-01 Dalam buku ini dirancang sebuah pengembangan sistem kontrol mesin pengelolaan sampah rumah tangga pada tempat pembuangan dengan metode human machine interface Metode human machine interface adalah sistem yang menghubungkan antara manusia dan teknologi mesin Pengembangan ini terfokus untuk mengetahui bagaimana penerapan metode human machine interface dapat membantu efisiensi kinerja dalam pemusnahan sampah dan mengurangi

tenaga manusia yang kurang efektif Pengembangan ini bertujuan untuk mengetahui solusi efektif bagi pengelolaan atau pemusnahan sampah yang kurang tenaga kerja sehingga tidak perlu menambah tenaga bantuan tambahan Pengembangan sistem kontrol mesin pengelolaan sampah rumah tangga pada tempat pembuangan dengan metode human machine interface adalah inovasi dan salah satu solusi dari masalah kekurangan tenaga kerja pada tempat pemusnahan sampah yang mempermudah pekerjaan serta mempercepat proses pengoperasian mesin tersebut

SISTEM KONTROL MOTOR LISTRIK BERKONFIGURASI PLC BERBASIS HMI Ali Nur Fathoni, Fendi Achmad, Puput Wanarti Rusimamto | Alvadi Muhammad Bintang, Putri Anggun Pratiwi, Muhammad Faiz Akbar, Rifqi Daffa Prasetyo, 2025-07-12 Buku ini menguraikan secara sistematis pengembangan dan penerapan sistem kontrol motor listrik menggunakan Programmable Logic Controller PLC yang terintegrasi dengan Human Machine Interface HMI Karya ini menjelaskan bagaimana teknologi otomasi modern dapat diterapkan untuk mengoptimalkan pengoperasian motor listrik dalam berbagai aplikasi industri Dimulai dengan pengenalan dasar motor listrik dan prinsip kerjanya buku berlanjut ke pembahasan mendalam tentang sistem PLC sebagai pengendali utama dan HMI sebagai antarmuka operasional Pembaca akan mempelajari proses perancangan sistem kontrol yang efisien teknik pemrograman PLC dengan ladder diagram serta pengembangan tampilan HMI yang informatif dan mudah digunakan Aspek implementasi praktis mendominasi isi buku mencakup petunjuk detail untuk instalasi hardware konfigurasi software pemrograman integrasi komunikasi serta pengujian sistem Studi kasus dari berbagai sektor industri memberikan gambaran nyata penerapan teknologi ini dalam mengatasi tantangan di lapangan Dengan pendekatan yang menggabungkan teori dan praktik buku ini menjadi panduan komprehensif bagi teknisi insinyur mahasiswa teknik dan praktisi yang ingin menguasai teknologi kontrol motor listrik modern yang handal dan efisien

KONTROL MOTOR INDUSTRI: PLC, HMI dan Inverter Fendi Achmad | Puput Wanarti Rusimamto | Ali Nur Fathoni | Fito Arya Wardana, 2025-11-01 Buku ini disusun sebagai bahan ajar yang sistematis aplikatif dan kontekstual untuk mendukung pembelajaran siswa maupun mahasiswa dalam memahami konsep dasar prinsip kerja serta praktik pengoperasian perangkat otomasi industri seperti Programmable Logic Controller PLC Human Machine Interface HMI dan Variable Frequency Drive VFD Materi dalam buku ini dirancang sesuai dengan standar industri

Programmable Logic Controllers Frank D. Petruzella, 1996-12

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