Reconditioning FESTO manufacturing machines for use with Rockwell Automation equipment

Presenting Author
Chand, Praneel
Waikato Institute of Technology (Wintec)
praneel.chand@wintec.ac.nz

Sepulveda, Joven
Wellington Institute of Technology (WelTec)
jvnsepulveda@gmail.com

Equipment such as programmable logic controllers (PLCs) become outdated and obsolete over time. Support for older devices becomes limited and they become incompatible with new computer operating systems. In the end, they are no longer used by industry. Hence, this project considers reconditioning a FESTO manufacturing machine by replacing the old PLC with a Rockwell PLC so that it's compatible with the mini industrial network in the mechatronics lab. This upgrade allows the machine to be used for student training in the automation courses.

Specifically, the FESTO MPS Storage and Retrieval machine is refurbished. The machine has three axis electromechanical gantries, a gripper, DC motors with encoder feedback, reed switches, and a pneumatic actuator. The IO connection from these components to the old PLC is traced and a new interface to the Rockwell PLC is established while keeping connectivity with the old PLC for legacy control.

After designing the new interface, some test programs were made in RS Logix 5000 using the Ladder Diagram (LD), Sequential Function Chart (SFC), and Structured Text (ST) languages. The machine was able to execute an automatic sequence of pick and place operations successfully. Future work will include designing a FactoryTalk View HMI and integrating the FESTO machine with other machines in the lab.

FESTO MPS System

Storage and Retrieval Machine

Allen-Bradley PLC

Praneel Chand is a Senior Academic Staff Member in the Centre for Engineering and Industrial Design (CEID) at Wintec. He holds a PhD in Electronics and Computer Systems Engineering from Victoria University of Wellington. Praneel's research focuses on the design and development of electronic and computer systems for control, automation, mechatronics, and robotics problems.