

Part Checker Lab Equipment

LAKE SUPERIOR STATE UNIVERSITY

LSSU Engineering Senior Projects

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Project Statement

This project updates lab equipment (part checker) for the course EGRS365 Programmable Logic Controllers (PLCs) to use a current generation Allen-Bradley PLC and Human Machine Interface (HMI). Determining hardware, ordering and implementation of the hardware, and testing the updated equipment are required for completion of the project.

Description and Use

The part checker is used as a teaching device in the course EGRS 365 Programmable Logic Controllers (PLCs). The class emphasizes programming of the controller and operator interface and the use of standard PLC devices and controller functions dealing with math, compares, moves, program flow, analog input and high-speed counters.

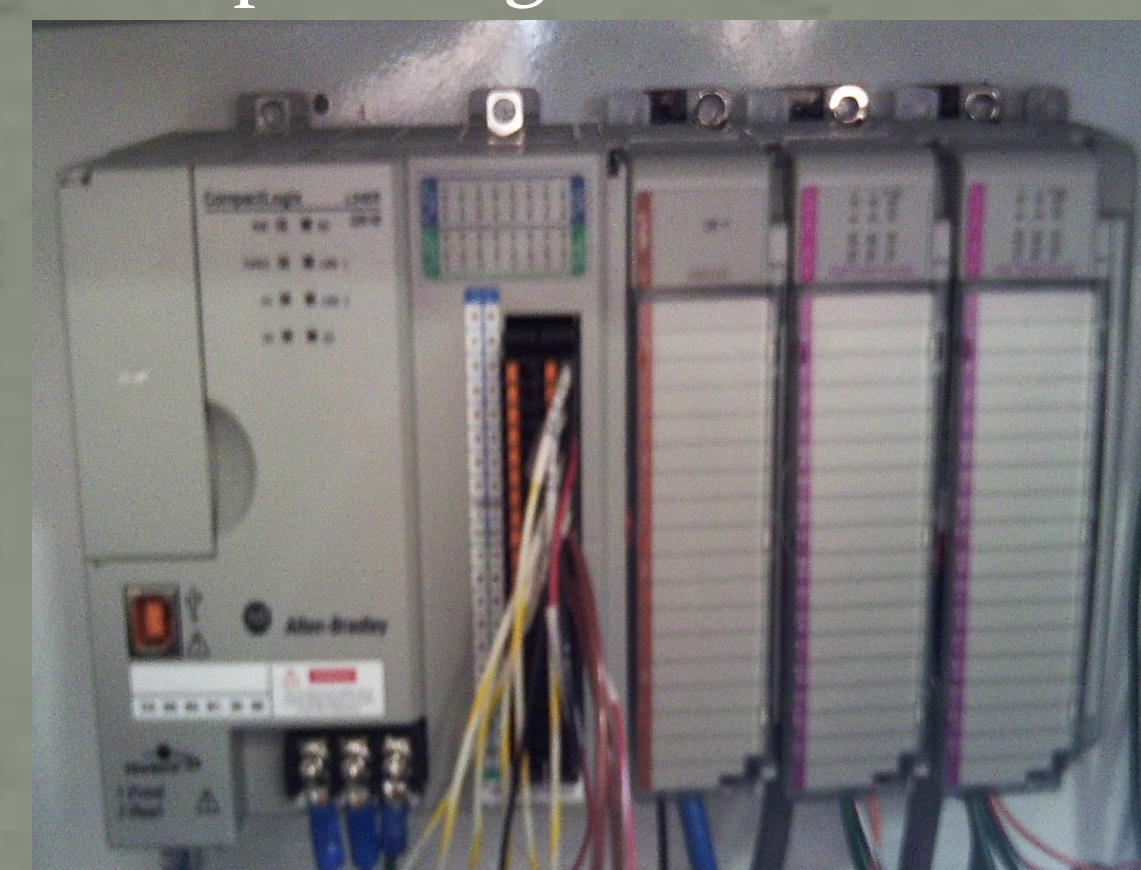
The part checker is used during a project in the EGRS 365 course. The part checker has two motors that precisely position a carriage in the X and Y directions with pin point accuracy. The part checker also has a plunger that is attached to the carriage and moves in the Z direction to measure feature height. For the project, students are required to create a program using RS Logix 5000 and Factory Talk software. Project requirements:

- System safely calibrates
- Carriage manually moves in X and Y directions but does not hit a hard stop
- A part is present to be checked
- Part is checked to determine if part is good or bad depending on hole depth of part
- Determine heights of features on part are correct height
- Keeps record of parts checked. i.e. total parts checked, good parts, bad parts, rework parts, good, bad and rework features
- Capability of entering new feature locations

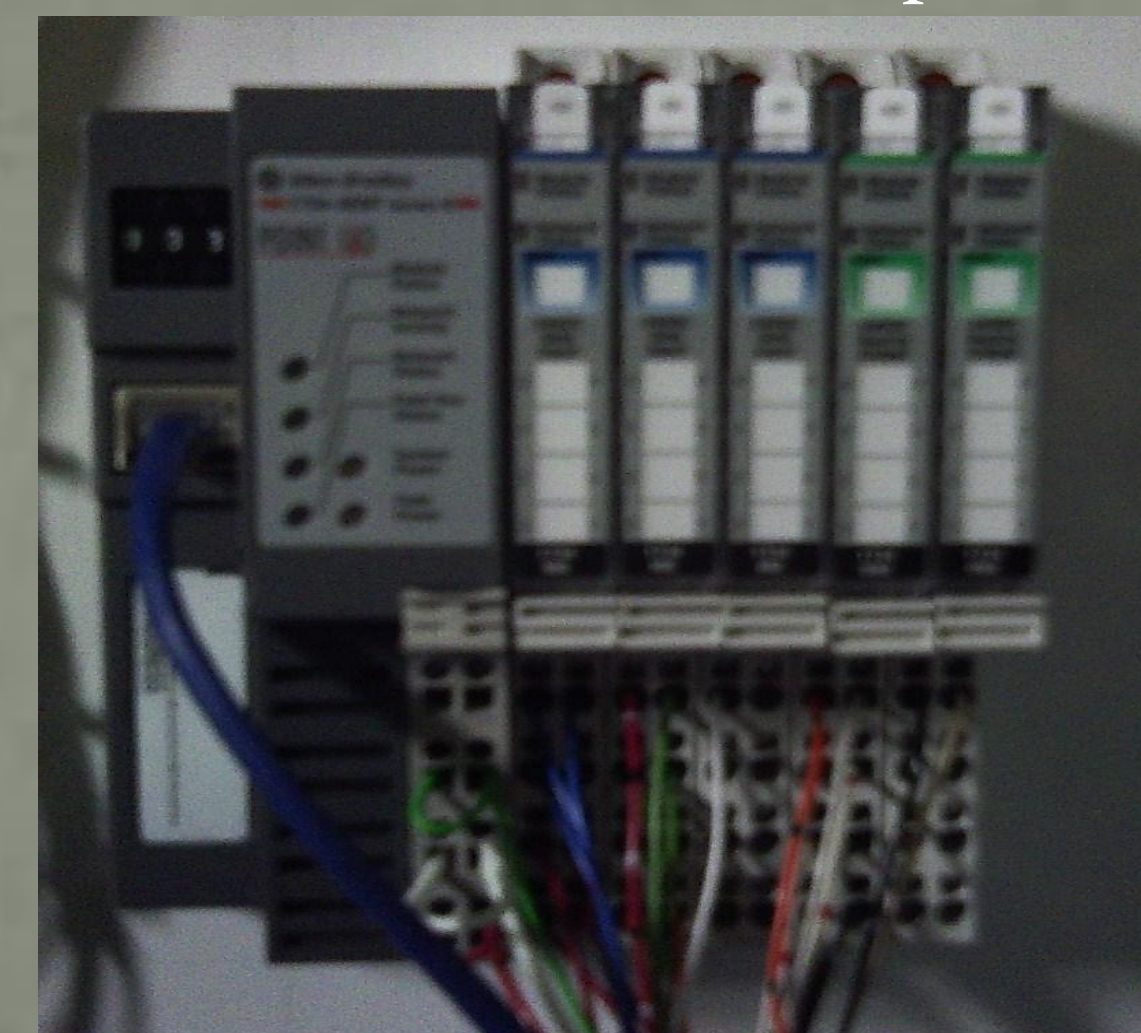
What's new?

With the redesign the part checker utilizes a new 24 V Controller, a new panel view and a 24 V Point I/O.

Compact Logix Controller



Point I/O Ethernet Adapter



PanelView Plus 6



Redesign Benefits

New Compact Logix Controller features

- High functionality in an economical platform
- DIN rail or panel mount for flexible installation
- Packaged controllers offer embedded I/O to lower costs and simplify configuration
- Analog, digital and specialty modules cover a wide range of applications
- Advanced system connectivity to EtherNet/IP™
- Full support for standard EtherNet/IP networks
- Integrated safety and motion capabilities in a single controller

New Point I/O features

- Extremely fast I/O backplane uses change-of-state (COS) connections to maximize performance.
- Module assembly mounts horizontally or vertically to fit your needs.
- Compact design lets it fit into limited panel space.
- Auto Device Replacement (ADR) allows OEMs to add machine features and I/O modules without making changes to the machine's control software.
- Removal and Insertion Under Power (RIUP) makes it possible to replace a module while keeping the rest of the system running.
- Modular components install easily by sliding together; pull apart easily for maintenance and troubleshooting. No tools needed.
- Removable wiring system for economic system commissioning, troubleshooting, calibration, and diagnostics – 70% time and cost savings.
- Efficient network solutions with EtherNet/IP communication adapters.
- Point Guard I/O is TÜV-certified for functional safety up to and including SIL CL 3 and Performance Level (e), Category 4.

New PanelView features

- 6 in. flat-Panel color display
- 320x240 resolution
- 18-bit graphics
- 22 function keys