

## PROBLEM/ MOTIVATION

The current cleaning process relies on manual washing of components, which can lead to inconsistent results, inefficiencies, and safety concerns, motivating the development of an automated parts washer system.

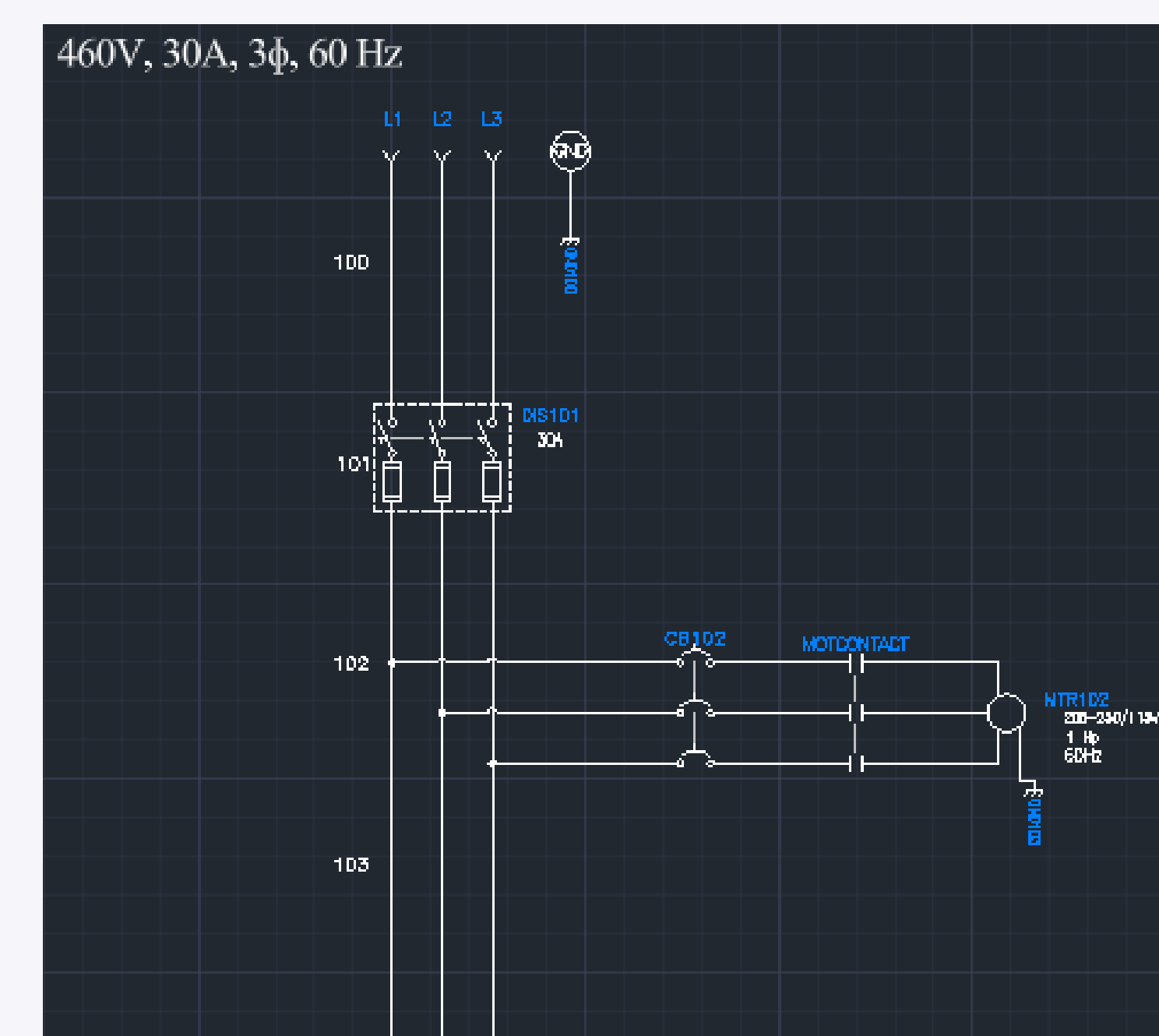
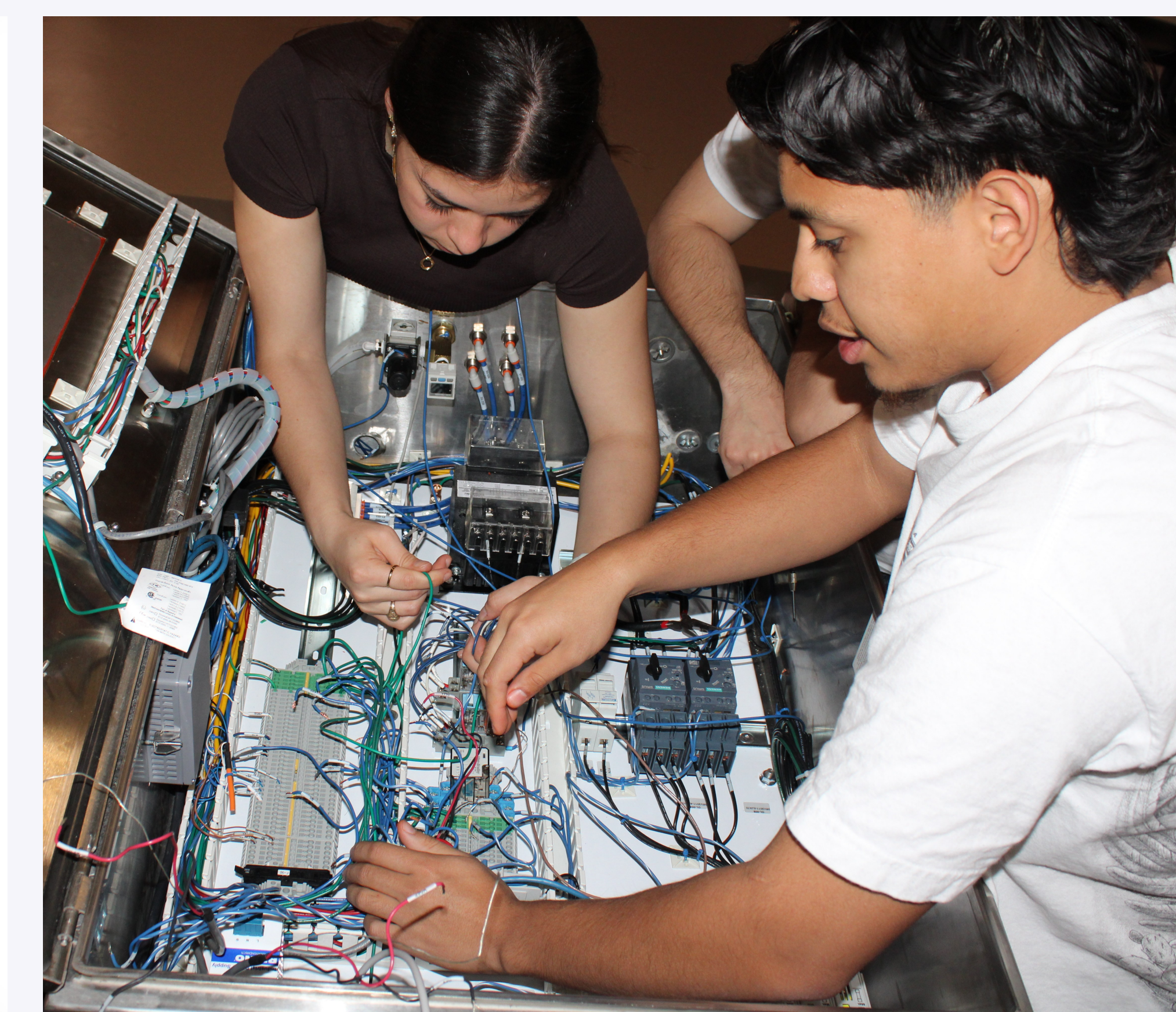
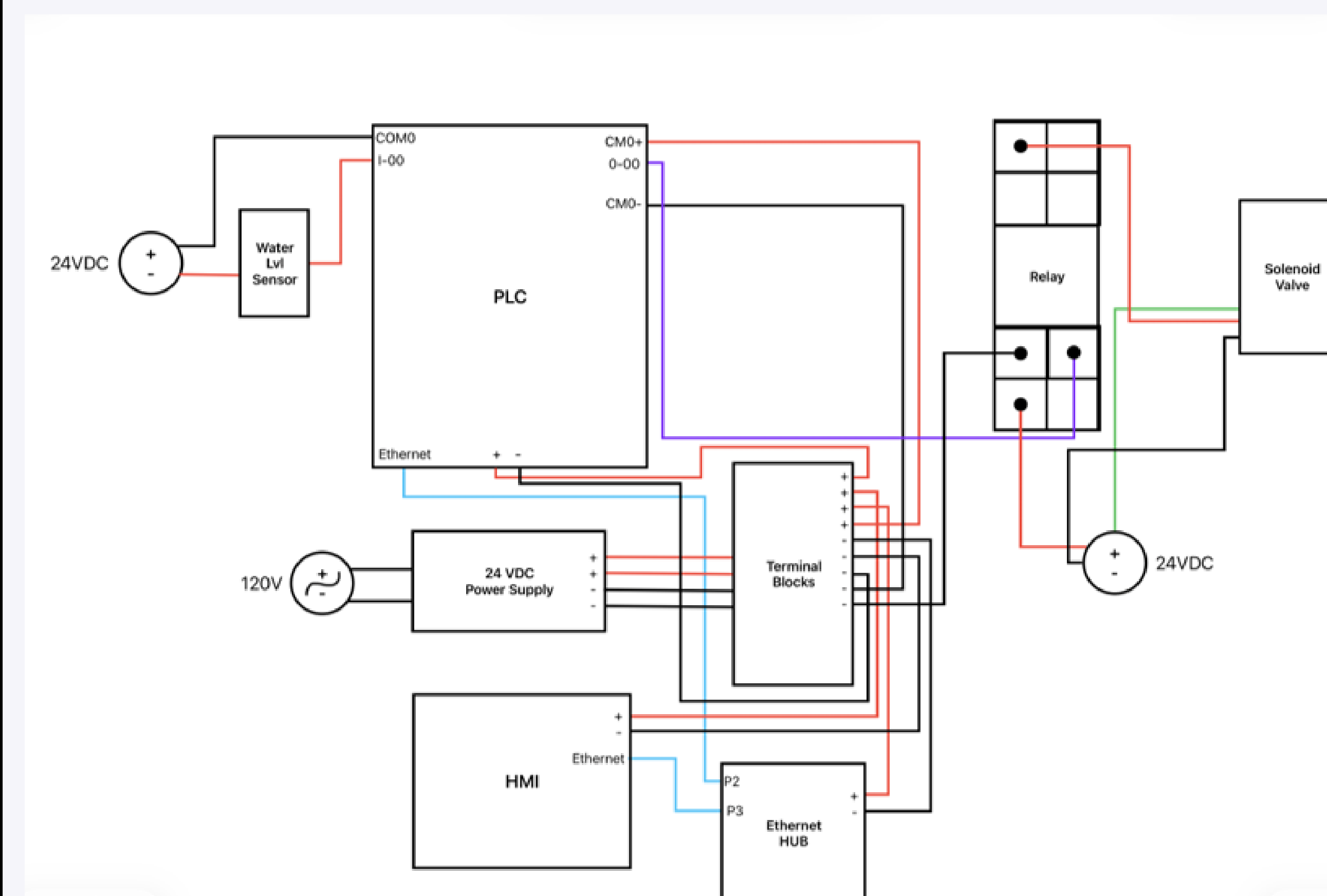
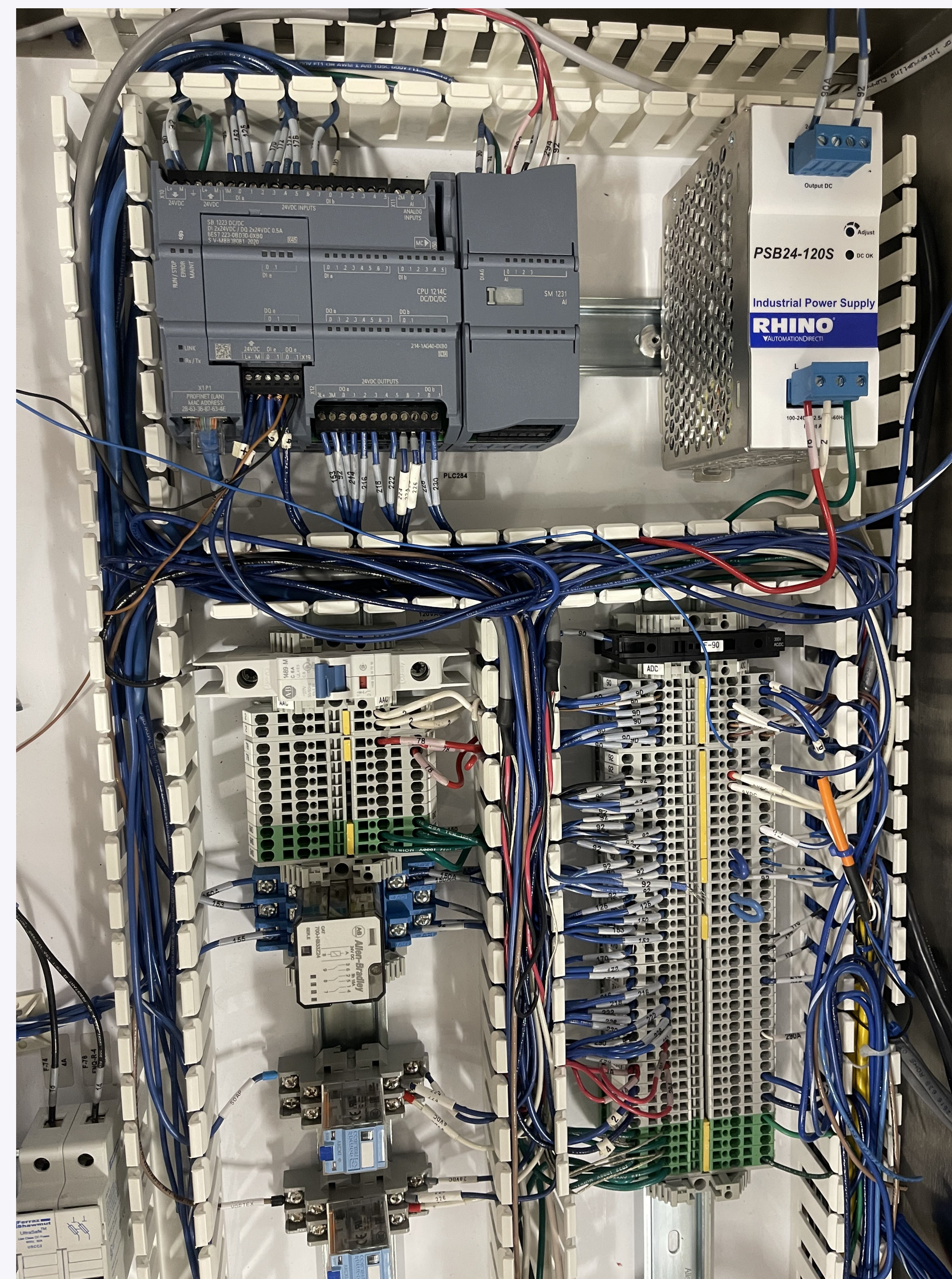
## OBJECTIVES

- Automate industrial component cleaning
- Reduce operator involvement
- Improve cleaning consistency
- Implement safe electrical power distribution
- Develop PLC-based control system

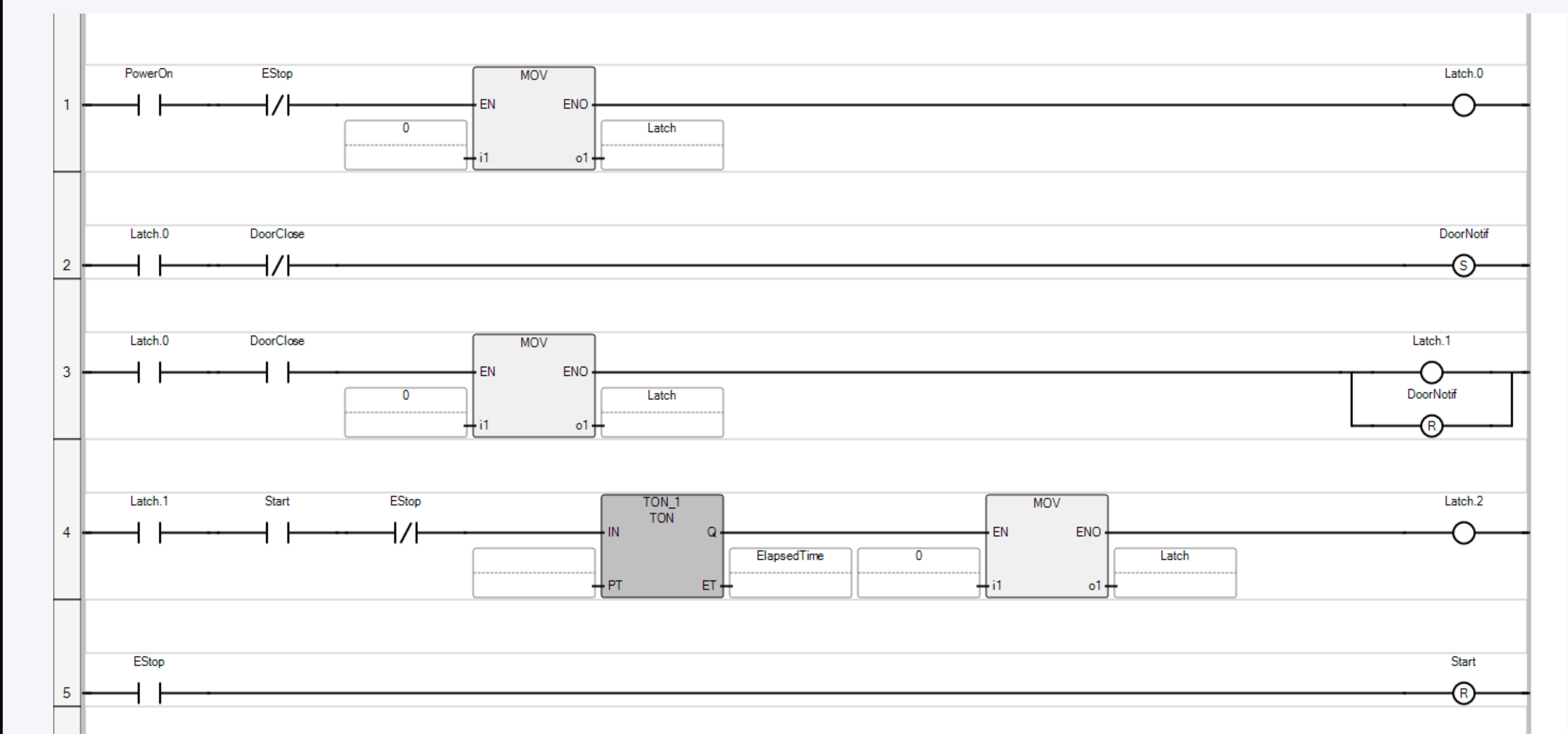
## SYSTEM OVERVIEW

- **PLC Control System:** Coordinates all system operations including pump activation, heating control, and wash cycle timing.
- **Ultrasonic Cleaning Module:** Provides additional agitation to remove contaminants from complex surfaces.
- **Sensor Feedback:** Temperature and fluid level sensors provide real-time data for safe and reliable system operation.
- **Human-Machine Interface (HMI):** Enables user control, parameter adjustment, and real-time system monitoring.
- **Actuation Components:** Pumps, valves, and heaters execute PLC commands to regulate fluid flow and temperature.
- **Power Distribution:** Route power from AC hookups to DC power supply, relays, terminal blocks, motor protection and contactor.

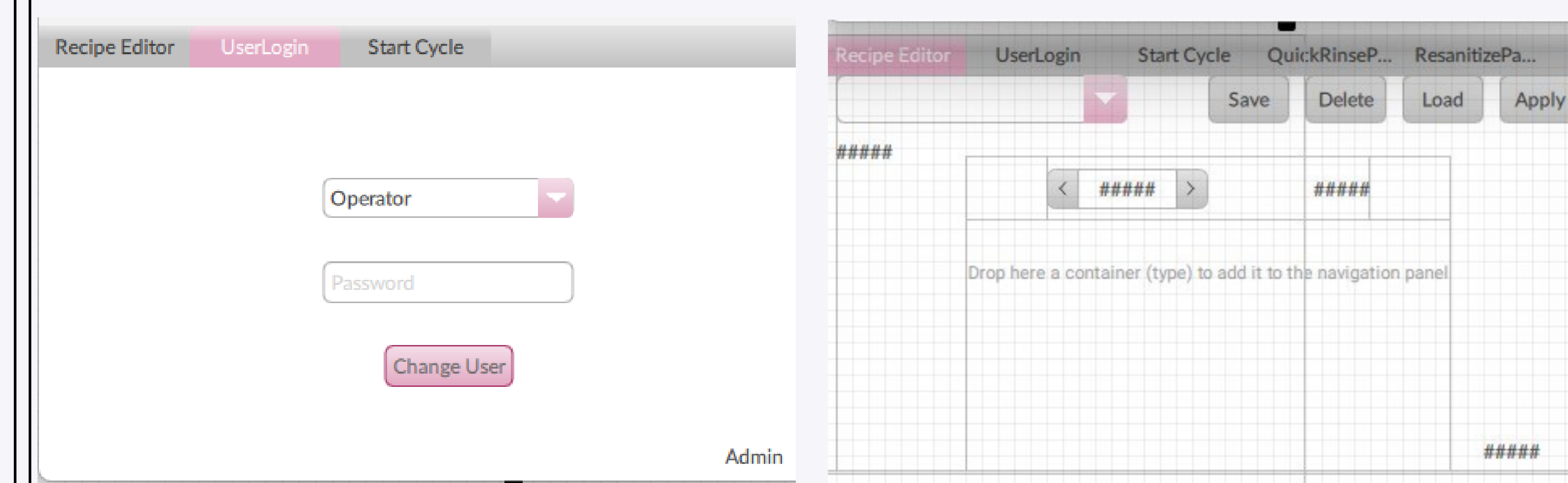
## CURRENT PROGRESS WITH ELECTRICAL & CONTROL SYSTEM DESIGN



## SOFTWARE FOR PLC PROGRAMMING AND HMI



Connected Component Workbench & FactoryTalk Optix



## FUTURE WORK

- **Recipe Management System:** Develop programmable cleaning recipes that control parameters such as chemical ratios, temperature, and cycle duration.
- **Closed-Loop Control:** Use sensor feedback to continuously adjust and maintain correct chemical concentrations and operating conditions.
- **Improved Consistency & Efficiency:** Enhance repeatability of cleaning results while reducing waste and operator error.

## ACKNOWLEDGEMENTS

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