Paint Booth Automation System

Samuel Gray  
_iowa State University_, samgray@iastate.edu

Eric Millers  
_iowa State University_, emillers@iastate.edu

Tylor Kosary  
_iowa State University_, tjkosary@iastate.edu

Michael Anderson  
_iowa State University_, mea1@iastate.edu

Jacek A. Koziel  
_iowa State University_, koziel@iastate.edu

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Paint Booth Automation System

Client: Iowa State University BioCentury Research Farm (BCRF)

Problem Statement
- The paint booth at the BioCentury Research Farm uses a manual exhaust system that relies on the operator to use their own judgement when determining fan usage for drying cycles and VOC removal.

Methods/Approach
- Follow manufacturer guidelines for part selection.
- Adhere to ISU guidelines for safety and procedures.
- Determine approximate dry times for all coatings based on paint products used by the BioCentury Research Farm.
- Monitor environment's temperature and humidity.
- Program environmental inputs to produce dry time outputs by using Automation Direct software and PLC.

Major Deliverables
- With safety and efficiency in mind, the addition of a Programmable Logic Controller (PLC) paired with temperature and humidity transducers made it possible for our system to monitor the fume hood environment to determine fan operating time for VOC removal and drying cycles.
- Program logic information.
- Installation instructions with operating procedures.
- Input/output list.
- Bill of materials.

Objectives
- Automate fan controls.
- Include visual indication for dry parts.
- Improve the painting process by removing additional inputs from the operator using a PLC.
- Use the automated system to cut down energy costs.

Constraints
- Budget – $1000.
- Automated controls.
- Visual indication for drying cycle completion.

References
- https://www.automationdirect.com/adc/overview/catalog/software_products/programmable_controller_software/productivity_suite_programming_software

Scope
- Deliver a cost effective, automated solution to the problem that satisfies the BioCentury Research Farm’s needs and improves the efficiency of their painting process. Delivery will be in the form of documentation and technical information pertaining to each deliverable.

Recommendations
- Use tags to indicate who painted a part and when it was painted to help with organization and flow of parts.