



Automation of Via Filler System

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Via Filler System



Automation Team

Background

The Pacific Trinetics Corporation (PTC) is the sponsoring company that is in need of modifying their via filler system from a manual adjustment to an automated one. Currently, the system is adjusted in the x-axis, y-axis, and theta by manually turning the three knobs based on the user's discretion. In phase 1 of the project, the design and product selection for the cameras and actuators were decided as well as research in the clamping system. Phase 2 continued product selection and developed a design for the PLC and motor mounts.

Requirements

- Pointing precision and accuracy between 250-500 μm
- Compatibility between all components
- Successful integration of all components

Goal

The goal of our project is to replace the via filler's manual adjustment with a vision alignment system allowing the machine to operate automatically.

Current Status

- Stepper motors can be driven in either direction.
- All components for the vision system are connected and the camera driver was successfully installed.
- Mini PC and vision system can now recognize both cameras.
- Basic understanding of PLC language.
- Can control signal to be on and off, shown on the LED lights on the PLC.
- Motor mounts for the x and y directions have been machined from aluminum 6061.

Next Step

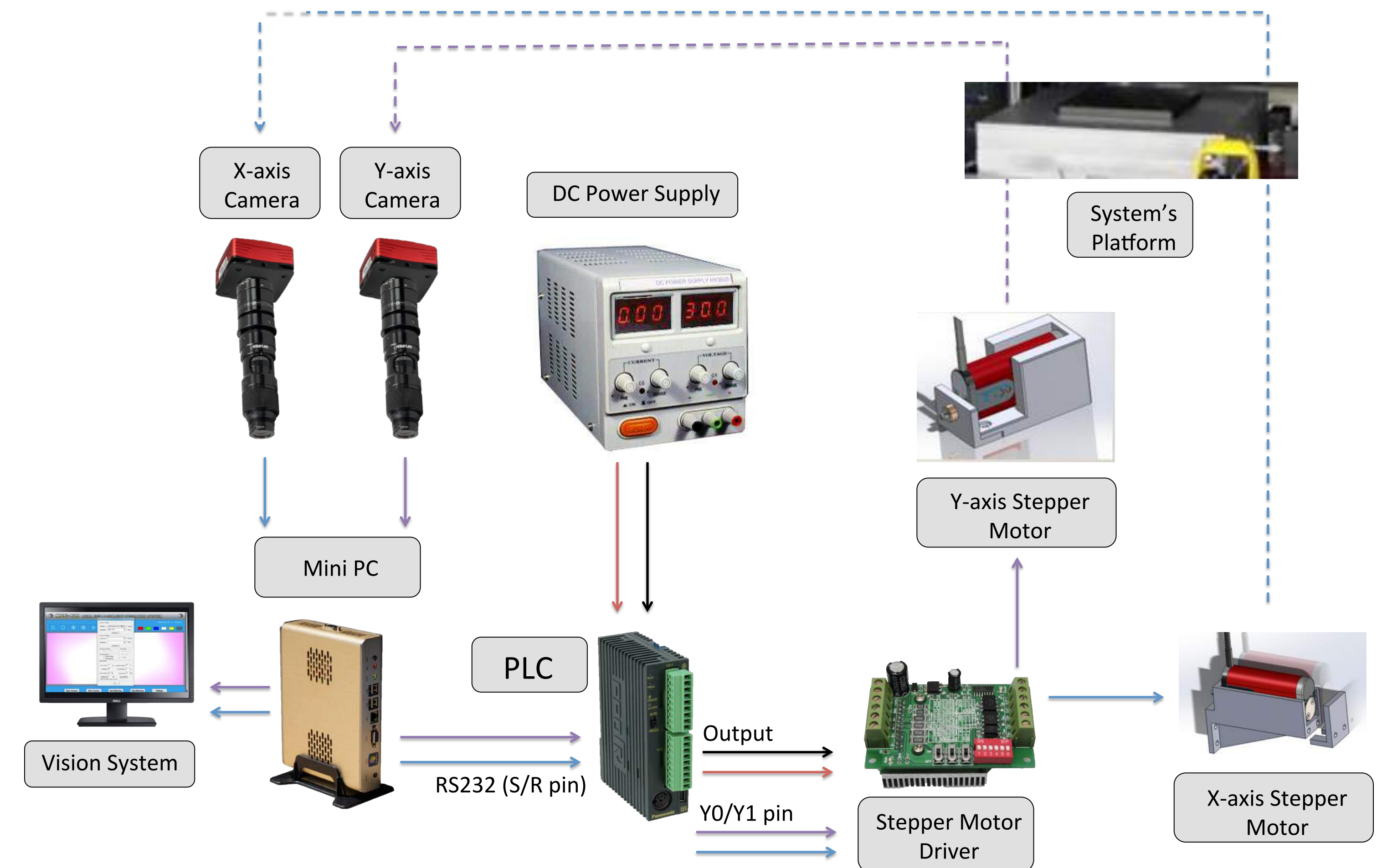
The next step in our project is to integrate all of the components together. Each piece can function individually, but now we need to conduct further tests to pull everything together.

Innovation

Our design is focused primarily on allowing the system to automatically align itself, and therefore dismissing the need for manual assistance. This can benefit the field because it absolves the need for workers to monitor this process.

Impact of Automation

The use of automatic alignment allows the via filler system's process to become simplified. Workers will no longer be needed to monitor this part of the process, and therefore can put their time into more useful tasks.



Control Block Diagram