



## CASE STUDY

# Engineering Study to Develop a Vial Dispense and Testing Solution

*Patti Engineering utilizes trusted advisor status and proven expertise to research and develop a solution for an integral verification station for a medical device manufacturer.*

## PROJECT SUMMARY

Recently, a leading manufacturer of medical diagnostic devices had an issue with one of their production lines. An integral verification station was a general bottleneck to production and its frequent inaccuracies led to a considerable amount of lost production. On top of these issues, they lacked the internal resources to develop a new solution.

During a conversation about future projects at their Indiana plant, their team brought this issue to their trusted advisor, Patti Engineering. Since this manufacturer did not have a solution developed, they were not in a position to begin the quoting process with their OEMs and integrators. Patti Engineering suggested an engineering study to complete a deeper analysis at the station to find out what the problems really were. Unlike standard integrator projects, the end goal was to develop the solution, not to implement it.

## CHALLENGE

Regularly during production, the reagent dispensing station would go through an automated weight check. This involved a Fanuc SCARA robot placing a verification tray filled with vials into the production line. Once the dispense was completed, each vial was weighed to verify that the amount dispensed was within the tight specifications. In the event of a weight discrepancy, another weight check had to be performed immediately in order to save all production created since the last accurate weight.

The repetitive invalid weights were not always caused by the station under or over-dispensing the reagents. The reagents have a very low threshold for evaporation, and the amount of time to be transferred from the station to the holding tray to the scale was long enough that a weight discrepancy would occur if the reagent were on the vial instead of in it.

The act of completing the verification created gaps in the production line, and the frequent invalid weights



led to a considerable amount of lost production. This manufacturer needed to increase throughput and was aiming to double production on this single line. With such high stakes, there was a great need for a new verification process. Patti Engineering aimed to gain the necessary insight into the station through the engineering study in order to design a better solution.

## SOLUTION

As a first step, Patti Engineering met with the manufacturer's team to develop a list of their desired outcomes for this station upgrade and gather their existing knowledge on the process. Then the Patti Engineering team used their extensive automation background to observe the station.

They started by focusing their efforts on the mechanics of the station. Each component, from the reagent pump to the dispense needle, was scrutinized for inefficiencies as an individual component and by how it interacted with the equipment around it. Next, operator involvement in the station was evaluated for areas of improvement. Then a deep dive into the reagents' physical properties was performed to understand how they would react to different process options.

Patti Engineering looked into several solutions with their machine building partner. Over time there became a clear winner that checked the boxes of those initial goals. The recommended solution would place precision measurement and flow control technology directly onto the dispense heads, allowing for real-time verification during every dispense. Issues could be found

sooner, affecting less product, improving cycle time, and increasing production throughput. All of the remaining resources were honed in on that recommendation as Patti Engineering developed the final documents for the project.

## RESULTS

At the conclusion of the project, Patti Engineering held a meeting to discuss all of the findings from the engineering study along with the final recommended solution. They also received a Bill of Materials (BOM), a Request for Quote (RFQ) description, and a Return on Investment (ROI) calculation.

Armed with a better understanding of their current system and the documentation from this project, this medical device manufacturer was prepared to take the next steps in resolving their production bottleneck. Patti Engineering provided yet another successful service to their long time customer and continued to uphold their trusted advisor status.

Founded in 1991, Patti Engineering, Inc. is a CSIA Certified Integrator offering high-caliber engineering and software development services. Patti Engineering is an expert in our partners' technologies.

**SIEMENS FANUC**

