



CASE STUDY

Siemens S7-1500 and WinCC OA Solution Mitigates Risk in the Textile Industry

Lead Engineer: Ryan Goad

PROJECT SUMMARY

Tailored Brands - a leading omnichannel retailer with brands such as Men's Warehouse, Moores, Jos. A Banks, and K&G Fashion Superstore - had a Houston Distribution Center in need of help. Two garment sortation lines were running on older Steeplechase VLC technology, which was posing an escalating maintenance risk. The lack of replacement hardware and security concerns fueled the need to mitigate risk and find a supportable solution to manage the hanger sortation process. When the lines were first installed, they had to use a PC-based controller in order to handle the complex algorithms, high speed communications to the Supervisory Database to achieve necessary response times. After establishing multiple technical advancements at their facility in the last twenty years, the decision was made to move away from PC-based controls and integrate a PLC solution.

They now needed to connect the new PLC to the database. Tailored Brands leaned on their trusted advisor and consultant, Patti Engineering, to assist with developing the new controls architecture.

Patti Engineering has a long-standing relationship with Tailored Brands: they aided in several controls upgrades at the facility since the early 2000s. The team's extensive knowledge of the equipment and production requirements made them the ideal systems integration partner to develop the right solution for the job.

"Tailored Brands has enjoyed a very successful relationship with Patti Engineering for nearly two decades," stated Vice President of Engineering at Tailored Brands, Andrew White. "The Houston distribution center project mitigated the risk associated with using legacy technology no longer supported by the vendor. In addition, we gained troubleshooting functionality for easier diagnostics to minimize downtime. Patti Engineering's team is very strong at taking complex projects and explaining them in a simple way, defining what needs to be done and making sure everyone knows their responsibilities for seamless execution. We have also been impressed by their post-project support. Patti Engineering's support team is very

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- ANDREW WHITE, VICE PRESIDENT OF ENGINEERING AT TAILORED BRANDS

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CHALLENGE

The Phoenix Contact Steeplechase VLC ran on a PC and handled the transactions between the field devices and the database, which housed the sorting algorithms. To ensure the hangers were sent to the correct destination, it was crucial for the response time to and from the database to match the rate of three to four garments per second.

The PC also ran a Visual Basic application in order for the operators to interact with the system. The visualization was very basic, so the real focus for the new SCADA package came down to quick and consistent communication that could perform at the rate that was needed.

Inside the existing panel was a PROFIBUS network connecting the PC to the WAGO I/O racks. PROFIBUS to ASi gateways were spread out throughout the system to connect to the ASi based field devices. The main focus of this project was replacing the current panel while ensuring compatibility with the existing ASi field

devices, necessitating a solution capable of communication with them.

SOLUTION & BENEFITS

Patti Engineering immediately began the process of selecting new hardware for the control panel. The PC was replaced with a Siemens SIMATIC S7-1500 PLC and Siemens SIMATIC ET 200SP I/O devices replaced the WAGO I/O. All communications within the panel were converted from the older PROFIBUS technology to PROFINET which can operate on a much higher transmission speed. The previous PROFIBUS gateways were changed to ET 200SP ASi bus masters. All of the ASi bus I/O blocks were left in place, along with the field devices, with the intent to upgrade those slowly over time.

Choosing the right SCADA platform for the job was a much longer process, as they needed to ensure that communication could keep up with the required cycle time. The Patti Engineering team setup bench testing in their Texas office and stress-tested several candidates. They used the actual algorithms from the database along with real data collected from the system to simulate the production floor. Throughout the testing process, WinCC OA was the clear choice, due to its robust architecture and fast response rate that was able to consistently meet the communication requirements.



There was also the added bonus of seamless integration into the new Siemens S7-1500 PLC.

The Patti Engineering team knew they also needed to make the programming easy to maintain. Since both lines ran with similar functionality, the decision was made to create one code source in the server and create an instance of the code to run each line. That way, any changes that need to be made in the future would only need to be made in one location and the results would be seen in both lines. Since the WinCC OA platform is also command-based visualizations, the original Visual Basic screens only required syntax updates to convert the screens.

RESULTS

Tailored Brands saw great efficiency gains due to the new hardware and software changes. With the utilization of the same field I/O devices and the retention of all sorting algorithms within the database, each line required less than a week for the entire implementation process. This rapid turnaround minimized operational disruption and ensured a seamless transition, ultimately saving valuable time and resources. While the WinCC visualizations do offer an updated look, all the buttons and readouts stayed the same, making it an easy transition for the operators.

With the new PROFINET network, remote access to the system was greatly improved by allowing both Tailored Brands and Patti Engineering more insight into the device diagnostics. Minor changes can also be made to the PLC code without requiring the whole system to be taken down, which was previously not possible with the old PC system.

The Houston Distribution Center was pleased to have a new system that offers enhanced ease of maintenance, with readily available replacements and supported software. This upgrade ensured smoother operations and improved reliability, providing the center with increased peace of mind.

SIEMENS **FANUC**



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