



L Series PLC Provides a Simple Control Solution for Fully Automated Paper Converting Machine

Case Study

Solution

- L Series Modular PLC
- Simple Motion Function Blocks
- MR-J3 Servo
- E700 VFD
- GT12 HMI

Premier Paper Converting Product Benefits

- Future proof machine
- Easy engineering & troubleshooting
- Optimized production efficiency
- Higher performance

Mitsubishi Electric Value-added Advantages

- Flexible control platform
- Easy to expand, customize and modify
- Single programming software
- Intuitive operator interface

BACKGROUND

Located in New Berlin, Wisconsin, Premier Paper Converting Machinery has expertise in stripping, partition assembly, and slitting machineries used to manufacture and assemble corrugated or fiberboard partitions of different sizes and finishes. These partitions serve as dividers to protect delicate items, ranging from bottles of wines to cryogenic vials, during shipping and storage. From its facility, Premier Paper manufactures and services machines that are shipped globally to customers in Europe, North, Central, and South America.

CHALLENGE

As Premier Paper began designing a new fully automated version of their Jumbo Assembler machine, a partition assembler for corrugated and fiber chipboard strips for paper converting applications, it was clear that the new machine would need an intuitive operator interface. But just as important as easy operation, the machine's new automation and control package had to offer flexibility for



“When I design something, I focus on what the customer wants. I also want customers to be comfortable with a well-known brand like Mitsubishi.”

– Bob Lesch, Engineering Manager, Premier Paper Converting

future customization, changes and modifications. Typically each of their machines undergo several adjustments and reprogramming to cater to customization demands and new industry trends.

Like most OEMs today, Premier Paper finds in order to design and produce machines that are unique and offer the best performance possible, they need to utilize the latest in automation and control technologies. While the company continues to lead innovation in their industry with converting machinery that is increasingly faster and more efficient in operation, they are also committed to integrating all innovations behind a simple and intuitive operator front end.

SOLUTION

Premier Paper chose Mitsubishi Electric Automation because they offered a single, integrated automation and control system that met all the requirements of their new jumbo assembler machine including, Programmable Logic Controls (PLCs), Variable Frequency Drives (VFDs), Servo

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Controls, Simple Motion, Human Machine Interface (HMI) along with a single control software package. Starting with their PLC selection, the L Series Modular PLC platform is a simple yet flexible system, but most importantly the control platform offers future expandability that satisfies their complex customization requirements. The assembler feeds up to 16 partition strips at a time using E700 VFDs connected through CC-Link network. These strips travel to a second platform where a secondary set of strips are perpendicularly laid to create a perfect grid. The positioning of these strips are controlled by the L Series Simple Motion indexing registration features along with MR-J3 servo drives over the SSCNET III Fiber optic network.

Up to 100 recipes may be stored in the L Series PLC, each determining the dimension of the partition strips and how they are fed through the machine. The different feeding modes include, continuous, intermittent, full indexing, and even/odd cells. The operator is able to select any of these recipes from a GT12 touch screen very easily.

RESULTS

With Mitsubishi's flexible L Series Modular PLC and GX Works2 programming software, Premier Paper successfully integrated the machine using a single control platform and software package. The intricate feeding modes are programmed using the Simple Motion Function

Blocks provided by Mitsubishi Electric. The program is easy to understand and modify for future customization and maintenance needs. Essentially, end-users have the flexibility to create infinite numbers of configurations for different partition types using one single machine. To execute the appropriate recipe for a specific partition type and feeding mode, the operator simply has to input or select parameter settings from the GT12 screen. Additionally, the control panel is sleek because the CC-Link and SSCNET III networks minimize wiring efforts and provide a clean solution. On-site start-up was nearly flawless, requiring very little troubleshooting during the commissioning process. Operating at extremely high speed, the new design more than doubles the overall equipment efficiency of the Jumbo Assembler utilizing Mitsubishi Electric's integrated automation and control solution.



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