

Splashing Dye to Beat the Band

Another KCC Software Application Story

When Maples Industries realized new trends in the textile industry would require faster and more flexible capabilities than they currently had, they turned to KCC Software to custom develop a pattern design and production system. The new system had to allow them to design new patterns down to 1/4 inch detail and apply the dye while running at greater than 1000 feet per minute. Why KCC Software? Because KCC Software could do the desktop (Visual Basic) pattern creation application, could do the high-speed production system, and could tie it all together in a seamless environment.

Before a pattern can be applied, it must be designed. The patterns are a complex layout of six possible colors to create the desired visual effect. An application needed to be created that would allow the designer to see down to the 1/4 of an inch but also see what hundreds of feet would look like when the pattern repeated. Thus, the design application had the ability to zoom in, zoom out, pan left and right, etc. allowing a variety of views to meet the demanding requirements. The patterns must then be stored so as to be easily and quickly be understood and used by the production system.

The production system included a PC for the pattern decomposition task and a PLC with distributed I/O for the actual dye application task. The PC was an industrial PC running Think & Do Live while the PLC was a WinPLC also running Think & Do. The PLC and distributed I/O were from AutomationDirect. An 8" C-More operator panel provided the interface to the dye-application WinPLC.

The process required dye to be sprayed onto yarn-like material as it passed through the process. The tubs of dye were rather large meaning the spray heads that applied the dye (by spraying while under pressure) were several feet apart. The system not only had to account for the distance between spray heads, it also had to account for slight variability in the speed and tension of the material as it passed through the process. According to the design, certain colors (6 in all) had to overlap just right (down to 1/4 of an inch) to create the look desired.

A sophisticated algorithm had to be developed that would account for all of these variables turning the dye on and off at precise times to achieve the desired 1/4 inch resolution. The material passed through the process at more than 1000 feet per minute. The algorithm had to account for speed and tension variability while applying the pattern as decomposed by the industrial PC.

In addition to the application of the dye, the system had to monitor the process alerting if dye levels got too low, if material tensions were too tight or too loose, and if the supporting I/O system detected any anomalies. The process also had to support automated processes to change out the dye levels between runs allowing for six new colors to be loaded.

The end result of this development was that Maples' orders soared. (So much so that a second dye application process was added.) By being creative and turning to KCC Software, Maples achieved their initial goals and grew their business offering new capabilities previously not available to their clients.

KCC Software
830 Eldorado Avenue
Huntsville, AL 35802
(256) 693-2334
www.kccsoftware.com

