Solutions

Issue 34

EMP TECHNICAL GROUP

Voting Machine Ballot Verification

Challenge: Automate the data mining process on a voting machine's results.

Solution: TwinCat label rewinder, Cognex DM70, registration sensor.

Story: EMP was brought into a local voting machine manufacturer to help improve their data mining process. Individual results need to be stored and easily accessed, so—as they're cast—votes are printed onto a continuous roll of paper. After the roll is complete, it is stored to allow for manual inspection if a specific vote needs to be referenced.

EMP was challenged to automate this process. Each voter print-out contains a line for every voting selection and a barcode at the end that contains all the data from the individual's ballot. The engineers at EMP knew that the barcode was the key to automating the process; they needed to design a system that would quickly read the barcodes and decided to incorporate a label rewinder to accomplish this.

They used the TwinCat from LabelMate, along with a Cognex Dataman DM70. The customer provides an input from their .NET program to the reader to let it know what barcode to look for. The roll of results is placed onto the rewinder and pulled over two metal shafts in order to keep the paper taut. The rewinder is controlled with a foot pedal; as the operator presses the pedal, the roll is unwound, and the scanner reads each barcode as it passes by until the correct barcode is identified. The machine then stops so the records can be verified.

Finally, the customer requested the ability to differentiate between a missing barcode and a bad barcode. EMP added a registration mark to achieve this: a trigger sensor spots the registration mark and tells the barcode reader when to scan. This allows the program to determine if a barcode is damaged or missing all together.

This solution has greatly reduced the amount of time needed to mine the voter data. If you have a process that you would like to automate, don't hesitate to reach out to EMP today!