



A Rockwell Automation Company

Sears Canada Inc. Catalogue Sales

The Client:

Sears Canada operates a distribution warehouse in Regina Saskatchewan for its catalogue sales in the four western provinces. All Merchandise ordered by phone or mail, as well as in-person orders placed at local Sears catalogue sales

offices or units (CSUs), are filled from this location. Once the orders are filled and sorted, they are sent to one of over 450 CSUs for delivery to the customers.

The Requirement:

Sears Canada's present warehouse had two sorting tray conveyor systems. The CSU Sorter was the primary sorter and sorted all packages going out to the CSUs. The Returns Sorter sorted all returned merchandise for restocking, price reduction and transfer to other retail outlets for liquidation, etc. The CSU sorter system was operated in a semi manual mode. The package entry was done manually by a number of operators at one or two induction stations. As the package passed an entry station another operator would read a three digit CSU code off a Bar Code label and manually key it into an operator input terminal. A DEC PDP series computer recorded the code and used a look-up table to identify which storage bin the store was assigned to. The DEC computer

would then actuate the tray tip solenoid at the appropriate time to dump the package off the tray and into the bin. The Returns sorter worked similar to the CSU.

The existing system needed replacing since the DEC hardware was discontinued, making parts, service and support major issues. Sears wanted to automate the coding system to relieve the operators from the tedious manual key entry. An added benefit was the ability to read much more information from the Bar code so that more accurate tracking of packages could be obtained.

The Design Solution:

Hinz was retained to design a new automated control solution for the existing tray conveyors. The solution was to maintain the flexibilities offered by the old DEC system, such as being able to assign a CSU to any bin and to have multiple CSUs assigned to one bin. At the same time it had to provide much better data collection features, be able to send the data to a host computer, and be able to relieve the operators of the tedious manual key entry and thus reducing errors. Hinz worked closely with the Sears Regina staff as well as the Corporate engineering staff in configuring a solution that met all these requirements.

It was decided that both the conveyor systems would use the latest in omni-directional high definition bar code scanners. The units chosen were manufactured by Accu-sort. The scanner would automatically read the multiple bar codes that could be present on the package as it passed under the scanner on the conveyor tray. Because manual induction stations would still be required for times when a label was unreadable or damaged, hand-held scanner guns c/w keyboard and LCD display were provided at each conveyor. The conveyor tray trip control would be accomplished in separate Allen-Bradley PLC 5/40s. The PLCs would be connected via a common Data Highway Plus to identical IBM PCs running the Intouch Wonderware software under

Windows 3.1.

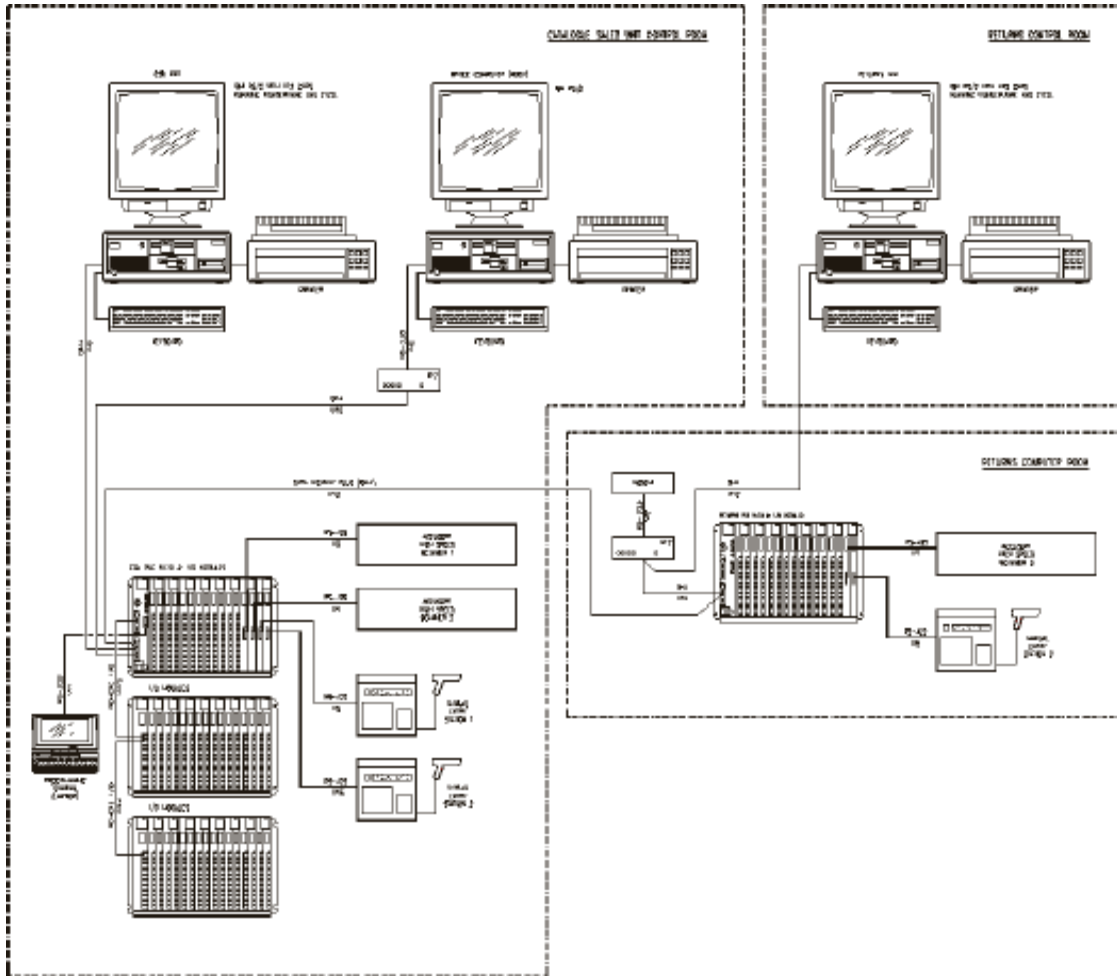
The CSU sorter system has two induction points, therefore there were two Accu-sort scanners and two Manual induction stations required. Each of the scanners send an ASCII character string via an RS 422 interface to the PLC. The CSU code is extracted from the string and used by the PLC to determine which bin the package is to be sent to. The PLC then sends appropriate data to the operator interface for display, reports, statistical analysis and tracking. Finally the code is sent to the Host Interface Computer to be uploaded to the Host so that further tracking and data collection can be performed as the package travels to its destination. The Returns sorter has only one scanner and one manual station. The functionality is similar to the CSU sorter.

The Operator has the flexibility to modify the bin and CSU allocations from the operator interface. Modifications are done using simple menu driven screens and pop down windows utilizing fill in the blank forms that are common with windows applications.



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System Specifications:

- 3 Omni-directional Accu-sort Bar Code Scanners
- 2 AB PLC 5/40s
- 3 laser bar code guns and entry stations
- 2 Wonderware operator interface systems
- 5 Wonderware screens
- 1 Host PC
- 1,000 Database tags in Wonderware
- 2000 Database tags in Microsoft Excel
- 550 PLC I/O

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com