



***RECENT RESULTS ENGINEERING
EXPERIENCE IN
MATERIAL HANDLING APPLICATIONS***

Project: Case Conveying and Sortation System

Engineering: Supply ladder logic, Operator Interface programming and OPC Server configuration services for a case conveying and sorting system. Cases of variable size are barcode scanned (redundant scanners) upon system entry and diverted to one of two OEM supplied case sealers. Cases are again scanned and sorted via pneumatic pop-up diversion into 1 of 50 holding lanes as determined by the operator through the operator interface terminal (OIT). Cases are automatically released from lanes in batches, count out entered by operator via OIT, to case unitizer/palletizer. Case data is supplied to proprietary database from ControlLogix processor via OPC server. System has capability to store data temporarily in case of network failure or database server failure. System has throughput capability of roughly 28000 cases per day.

Equipment: PanelView Plus, RSView ME, ControlLogix, RSLogix5000, Ethernet, DeviceNet, OSI PI, Sick Barcode Scanners, RSNetWorx, CompactLogix, CompactBlock I/O, CDN066

Location: Waterville, Maine

High Technology Solutions for Industrial Control and Information Systems

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- Project:*** Warehouse Storage/Retrieval System Controls for OEM
- Engineering:*** Software Design and Programming of the PLC to a Warehouse carousel storage & retrieval system as well as startup support of equipment. The PLC interfaced with host software which would command the system to retrieve or store totes from/to locations within the carousel system. The PLC would control both the carousel and the retrieval/storage device to properly retrieve and store totes as commanded. Both the retrieval device and the carousel involved precise positioning to ensure proper delivery of totes. In addition, conveyor controls were programmed to properly deliver totes to the requesting operator workstation. Multiple systems were deployed across the country.
- Equipment:*** Allen-Bradley SLC 5/04 with High Speed Encoder cards, UNIOP Operator Interface, various motor drives.
- Location:*** Various Locations across the USA

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Project: **Packing/Shipping Conveyor Extension and Upgrade**

Engineering: Since an existing problem was with incorrect reads of the barcode labels, a visible beam fixed scanner was chosen that scanned fast enough to get three matching reads before calling the result “good” and sent to the mainframe for lookup. A serial to Ethernet converter was used to move the data at well beyond the required speeds from the scanner to a PC running a program, written in “C”, which communicated with both the mainframe and the PLC. Our past experience with material handling and automation allowed Results to specify where additional photo-electric proximity and scan-thru sensors should be placed to allow modular and robust PLC code to be developed to handle merging and diverting of the boxes. PLC code that was compact for speed yet intelligent enough to keep track of various destination and positions of multiple boxes was the final challenge. All of the features of PLC programming were required; indexed indirect addressing, FIFO’s and shift registers all played a part in keeping the code compact, yet robust. Efficiently debugging a system that tracks multiple packages at once and where many things happen within a 150 millisecond window also added to the challenge.

Equipment: Intelligent Bar code scanners, complex PLC logic as well as a “C” program running on a Windows PC with a connection to a mainframe. Other technologies included Ethernet, DH+ and serial networking or multiplexing, variable frequency drives working under a real-time speed control loop, and a touch-screen operator panel.

Location: Biddeford, Maine

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