



A Rockwell Automation Company

Alberta Wheat Pool Vermilion High Throughput Elevator

The Client:

Alberta Wheat Pool is a farmer-owned cooperative. It handles grain as an agent of the Canadian Wheat Board and markets grain, oilseeds, and specialty crops for its farmer members both domestically and internationally. Alberta Wheat Pool is a world leader in developing

grain handling technology, improvements to crop varieties, and developing new markets. An example of its leading role is installation of a new high throughput grain elevator in Vermillion, Alberta, .

The Requirement:

The new elevator was to be a highly automated design of all steel construction . Capacity of the work house is 3,220 metric tons or 117,000 bushels. Three steel storage bins add additional storage of 3,520 metric tons (266,000 bushels). Nineteen bin capacities vary from 4,000 to 8,600 bushels. Dual driveways allow receiving from two trucks simultaneously. The elevator has two side by side 10,000 bushel per hour legs. Each leg is equipped with an automatic sampler. In addition to the two bucket elevators, machinery includes a dual electric distributor, drag conveyors to and from steel tank storage, and a 17-car continuous cable progressioner. All bin gates, pit gates, and scale gates

are hydraulically controlled. Two computer monitoring systems are to be installed - one in the office and one in the shipping booth. The entire elevator must be operable from either location. A Compu-Watt system is installed on each leg for estimating the amount of grain elevated without having to weigh it. Safety and control instrumentation includes leg speed monitors, motor current monitoring on legs, conveyors, and car progressioner, leg bearing temperature monitors, high level switches on all bins, overflow monitors on distributor and top drag conveyor, low and high level sensors in all pits, and limit switches on all gates.

The Design Solution:

Two US Data Factory Link Graphics Software packages are installed onto two IBM PS/2 model 70 computers. The computers are Modbus and connected by SM85 Network adapter cards to a Modicon 984-485 PLC. Each computer is able to control the facility and print both transaction reports and alarms. Graphics pages permit the operator to view the entire elevator and control shipping and receiving. Operators can select appropriate front and back pits, enable and disable the sampler, and select primary and alternate bins for both grain source and destination.

An "electronic chalkboard" concept is displayed to permit the operator to keep track of which grain type and quantity is in each bin. Technical table data entry allows adjustment of draft and freefall weights for each grain type.

Motor screens display the status of each motor and permit operation by clicking the mouse on the

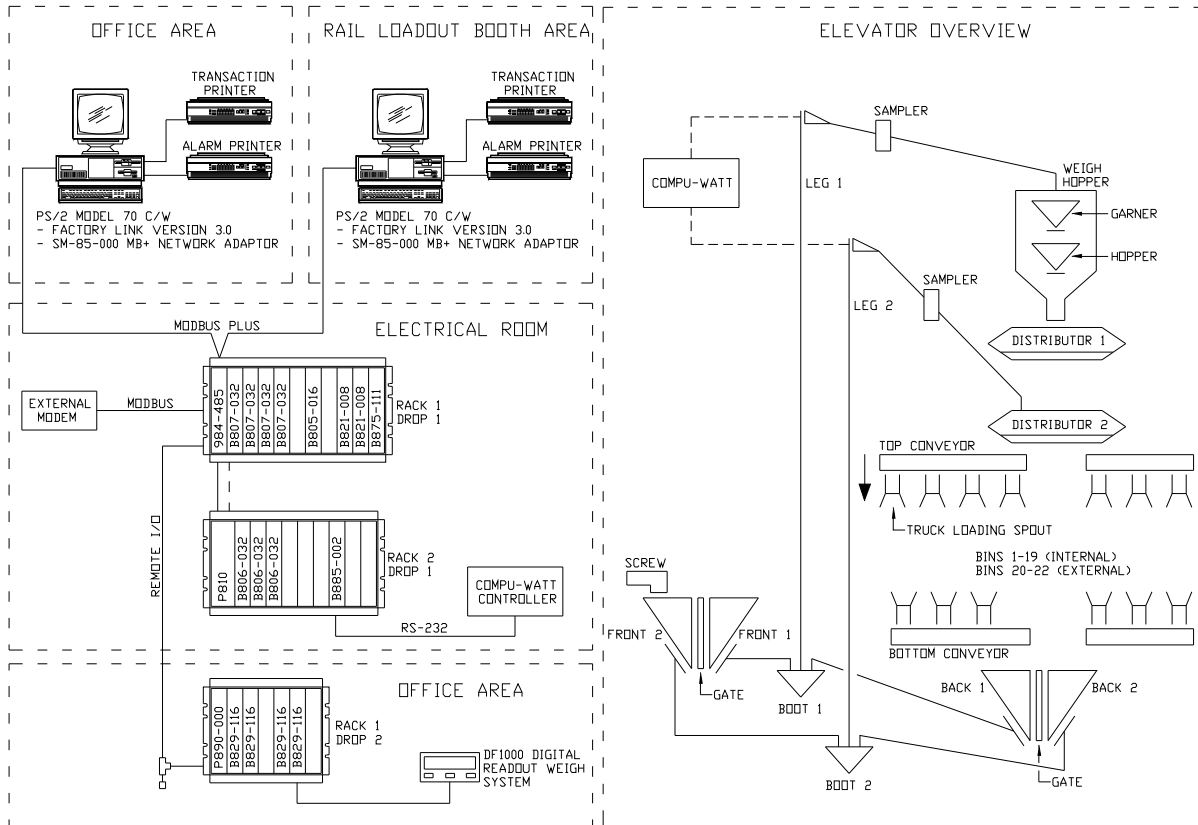
applicable motor label. Runtimes and quantity of starts are tracked for each motor.

Rail shipments are highly automated, permitting individual grain types to be selected for each of the rail cars 4 - 23 metric ton compartments. Shipping and receiving information screens permit the entry of data for each transaction. This includes time and date, type of grain, compartment number, producers, dockage, moisture, car number, clean-out required, destination, protein, gross, tare, and net weights. Upon completion of filling a compartment with the specified weights, the operator is prompted to move onto the next compartment or rail car. If different grains are selected during the filling cycle, a clean-out function is performed on the remaining grain in the system to return it to the bin from where it came. Once completed the next grain type is selected and loaded. At the end of each car a transaction ticket is printed.



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System Specifications:

- 1 Modicon 984-485
- 2 IBM PS/2 Model 70
- 2 SM85 Modbus Plus Network Adaptor Cards
- 2 U.S. Data Factory Link Operator Graphics Packages (DOS)
- 2 RS-232 Links to Compu-Watt
- **Controllers**
- 4 Transaction and Alarm Printers
- 20 Graphics Pages
- 2 DF1000 Digital Weigh System's

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

www.hinz.com