



A Rockwell Automation Company

## Parkland Strawboard Inc. System Layout for PC Based Control

### The Client:

Parkland Strawboard Inc. is a panelboard manufacturing facility located at Kamsack, Saskatchewan. The plant process was built using a reconditioned press and finishing line and a combination of new and reconditioned equipment for the remainder of the plant interior and green end. The plant is designed to chop and process between 7000 to 8000 lb./hr of wheat straw into finished panelboard. Liquid resin is

blended with the wheat straw fiber as a bonding agent. A 30 metric ton, 9-tier press provides the heat and pressure required to bond the wheat fiber into panelboard. The finishing line includes a sanding process to provide a smooth surface on the finished product. The product is sold as high-end panelboard for furniture and cabinet construction.

### The Requirement:

Hinz provided a complete electrical engineering package including building services and lighting, Substation design, motor control, instrumentation, and plant automation. Plant hazardous area classification was required for this Class II, Div 2, Group G process. Specifications were provided for electrical equipment tender and procurement. Hinz acted as

liaison between SaskPower Power and Parkland Strawboard during all phases of the project. Construction supervision assistance was an integral part of the construction package. Hinz panelboard specialists provided on-site assistance for plant startup and final adjustments to process parameters.

### The Design Solution:

#### Plant Electrical Power

Plant electrical distribution consists of a 2000 kVA, 25000-600/347V resistance grounded main transformer, a 2500 amp main switchboard, and four motor control center lineups. A pulsed neutral grounding resistor and monitor system was employed for the main transformer neutral grounding. Provisions were made for power factor correction equipment to be added in the future. A total of 170 motors at 600VAC is connected, with loads ranging from fractional horsepower to 250 HP.

#### Plant Automation

Plant Automation is unique in that a traditional PLC solution was not selected. To reduce the cost of the automation system for the client, a PC-based control system using Think & Do Studio industrial control software package running on a control room desktop computer with Koyo Ethernet IO was selected. The desktop computer running Think & Do Studio combines the process control and HMI into a single integrated box. Logic development and HMI development are accomplished in the same graphical development environment. Both logic and operator interface also use the same tag database, thus avoiding the traditional separate lists of addresses and tagnames for PLC and HMI equipment. Since the development environment is on the same computer that is controlling the plant, there is no need to maintain a separate engineering workstation for troubleshooting.

The process logic is developed using Flowchart programming techniques, rather than ladder logic. The advantages inherent with Flowcharting stems from the

'process oriented approach' that is possible, as well as the significant process diagnostic capability that naturally comes with programming in this manner. Think & Do Studio's capability for process simulation also allows extensive testing without connecting to real equipment, effectively reducing the time required for commissioning.

The Windows 2000 based computer is connected to an Uninterruptible Power Supply (UPS), and communicates with the IO mounted in the MCC room via optical fiber Ethernet. The Ethernet IO is Koyo 405 series with Ethernet based controllers in the rack. A total of 8 racks of IO are connected in this way to the Think & Do computer.

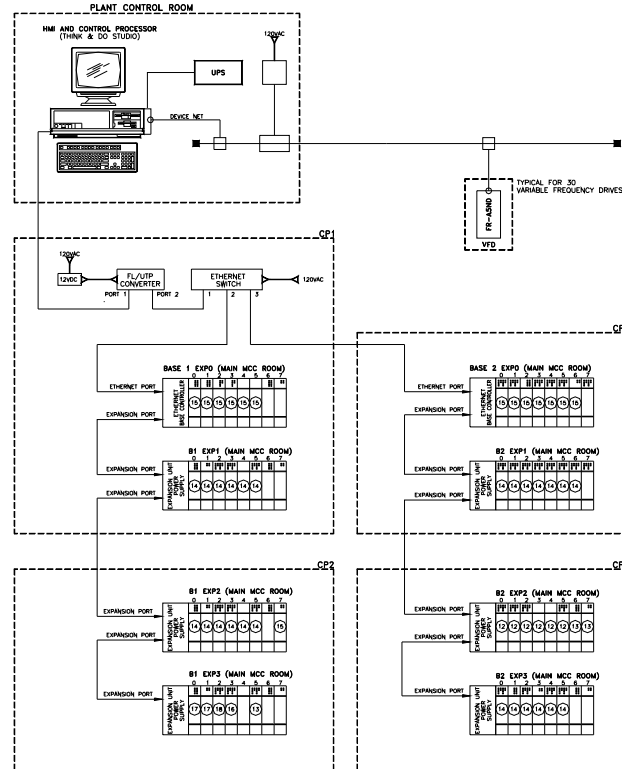
A total of 30 Variable Frequency Drives (VFDs) are controlled from the Think & Do computer using a dedicated DeviceNet network with flat media and KwikLink taps for connection to the VFDs. This solution has resulted in considerable savings in both wiring costs, and discrete and analog I/O that would have been required if implemented in a traditional manner with 4-20mA analog reference signals. As well, a considerable amount of diagnostic information is available over the DeviceNet interface on the operating health of all the VFD drives.

The HMI is an integrated part of the Think & Do Studio industrial control system, and consists of 20 graphical screens that cover all aspects of the plant. A complete alarming and live/historical trending capability is also included in the system.



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### System Specifications:

- Main Transformer 2000kVA, 25kV-600/347V
- 5A continuous, 2.5A pulsed, 600V neutral grounding resistor and monitor system
- 2500A, 600V, 3 wire Main Switchboard
- four 600V, 3 wire, 600A MCC lineups
- 30 Variable Frequency Drives
- 170 motors @ 600V, 3 phase, ranging in size from fractional horsepower to 250Hp
- PC based system with Entivity Think & Do Studio Industrial Control Software
- Fiber Optic Ethernet Communication Network with 2 I/O drops and a total of 8 I/O racks, each consisting of 8 slots
- DeviceNet control of Variable Frequency Drives
- Approximately 800 I/O points
- Integrated HMI with 20 screens
- Integrated Trending and Data Logging

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

[www.hinz.com](http://www.hinz.com)