



Batching Automation

ON THE JOB: Grain Place Foods, Inc., Marquette, NE, produces organic food ingredients and finished products. They manufacture products ranging from organic bird seed to organic cereal ingredients for organic bakers.

As the company's business began to grow, they started considering automating production in their newly expanded plant for the 15 dry materials they work with for ingredients. Grain Place Foods produces numerous specialized organic products and their batching had been manual because of the special formulas and the smaller quantities involved. However, as demand increased, the need for greater capacity became necessary. Also, their customers were taking delivery of the product in large containers, such as 2,000 pound totes.

EQUIPMENT USED:

- Large mild steel control cabinet painted white
- 788 programmable controller with two scale inputs and four 778D cards (input/output)
- Manual switches for controlling all functions of the batching system

Cardinal Scale Manufacturing Company representatives, Webb City, MO, and Cardinal dealer Wing Scale, Grand Island, NE, consulted with Grain Place Foods and began to work out a plan to automate the batching of their organic products. The project evolved over a three year span to create a fully automated system that the company is very pleased with. The project was completed June 2005.

The batching system is unique and has two modes of operation which can involve either one or two scales for production of the desired formula. The primary mode of moving the ingredients is via a unique air handling system. The other feature that makes this project unique is that it only batches one ingredient at a time. Essentially, it will fill and discharge one ingredient at a time into the holding hopper and all the ingredients will have to be in the holding hopper before it will discharge into the mixer.

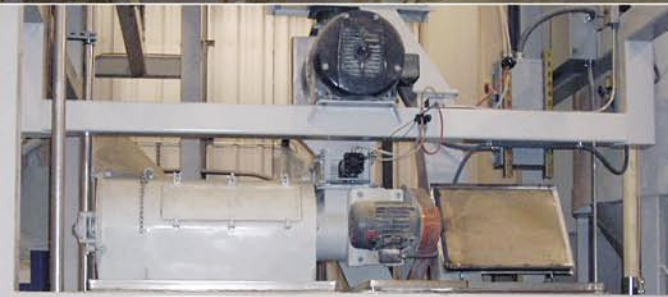
Cardinal's versatile 788 programmable controller was utilized to automate the batching operations. The controller was manufactured in a large, mild steel control cabinet painted white and has manual switches for controlling all the functions of the batching system.



Application compliments of:

WING SCALE
Grand Island, NE

Grain Place Foods 788 Programmable Controller



The 788 has the following features which made it conformable to this project:

- Two modes of operation: Operation #1 uses only one scale and Operation #2 uses two scales
- One or two scale batching
- 15 dry ingredients
- Two mixer controls (mixer A or mixer B)
- Holding hopper over mixer A control
- Hand additive input
- Sizing mill control
- Mixer A discharge diverter (finish product storage bin, finish product tote or further processing)
- Hammer mill control
- Mixer B (one direction to mix and reverse to discharge)

The 788 controller has plant setups for:

- Zero tolerance for each scale
- Mixer timers for run timers and discharge timers
- Holding hopper discharge timer
- Bin names for product in the bin

The formula setup involves:

- Formula name
- Operation type
- Number of ingredients
- Weight for each ingredient
- Trim weight for each ingredient



The formula is such that the ingredients can be input in any order or one ingredient can be input twice. The system has the ability to store 50 formulas for selection.

When a formula is to be batched, the operator presses the SELECT key and the formulas are displayed on the screen. The operator selects the formula then selects the number of batch required for the production run. After making this selection the START key is pressed to begin the batching. The system will then operate automatically until the number of batches has been produced.

How your food is produced does matter.

During the batching, the system will output to a printer to print the formula name, time, date, and ingredient weight after cutoff. The ingredient weights are also accumulated to provide a raw material usage report and the formula is also accumulated to provide a production report of finished product. The totals can be viewed on the screen, printed, and cleared.

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