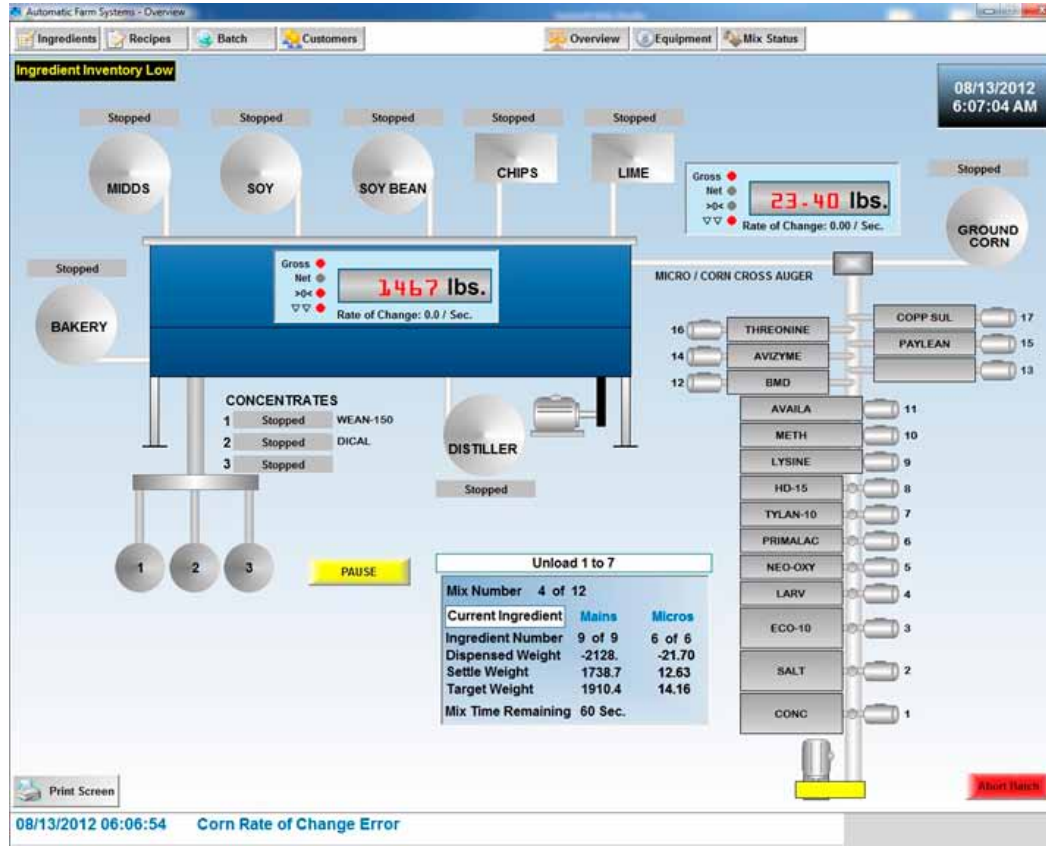


Wilson-Groom Updates Farm Automation and Feed Mill Management

Wilson-Groom updated the existing feedmill automation system used by Automated Farm Systems for their feed mill machinery, and surprised everyone with the results.



- Automated Farm Systems asked Wilson-Groom to create a new feed mill automation system for their farm equipment. Wilson-Groom chose InduSoft Web Studio for the project.
- The application allows for greater control of augers, provides mobile alerts for operators, allows extensive refinement of recipes and mixes, and records batch data.
- Feed mixing time has been reduced by approximately 50% as a result of the implementation of the InduSoft Web Studio Solution.

Figure 1: The alarm banner at the bottom will notify the user that a problem has occurred. The alarm status is also sent to the user(s) via text message.

The idea of a highly automated system existing in a rural setting such as a small, independently owned farm may seem incongruous, but in order to keep up with large-scale commercial agriculture, many small farms are turning to automation to keep their operations efficient and competitive. Wilson-Groom, Inc. a systems integrator in Pennsylvania, tackled the problem of bringing reliable, flexible, and cost efficient automation to feed mills in their recent project for OEM, Automatic Farm Systems.

Background

Automatic Farm Systems (AFS) manufactures, sells, and installs feed and grain handling equipment

in Pennsylvania. This equipment is used in the feed mills of independently operated farms that want to automate and customize the nutrition of their feed for poultry and swine. Automatic Farm Systems has been in business since 1982, developing automated solutions from the ground up. In order to stay ahead of demand for automation technology, AFS recently decided to upgrade their proprietary computer-based solution with a feed mill application designed by Wilson-Groom.





Figure 2: Adding data to a recipe is performed through the use of pop-up windows.

Automatic Farm Systems had clear goals in mind when they reached out to Wilson-Groom. They wanted a solution for their feed mill equipment that offered the flexibility to be easily customized for individual installations using a variety of equipment configurations. They wanted a solution that would also allow them to be competitive among other farm equipment companies offering automated solutions. They were confident that a strong control and monitoring system for their equipment would set them apart, and contacted Wilson-Groom based on their proven ability to create solutions that met similar requirements.

Feed mills can range from small, single farm systems, to massive commercial operations. Independently operated farms, like that of Kerek Musser, need a high level of control over the specific mixes of micronutrients and ingredients used in each mix. Additionally, they require the ability to record each mix and batch, and use that data to analyze the cost effectiveness of different recipes. Because Kerek Musser's farm was the ideal candidate for Automated Farm System's planned application, Wilson-Groom's solution used Musser's farm as the testing ground for their development process.

The Challenge

The original application designed for AFS was built in C+, for a windows-based computer, using OPTO22

hardware. While this program met the basic needs AFS had for customers, it was an inflexible solution that could not be easily changed to reflect different architectures or meet varied customer needs. The costs associated with changing the program were also high, and this presented challenges in selling and marketing a fully automated feed mill system. An additional problem was that the database maintenance program did not work with Windows Vista, or Windows 7. At that point, it became necessary to find a solution that would be able to adapt with changing technology more readily.

AFS contacted Wilson-Groom, a systems integrator in Pennsylvania with experience creating data-driven SCADA systems for clients. They presented the challenge of creating a more flexible solution for their feed mill system, and Wilson-Groom began researching different implementation methods for this project, and speaking with Kerek Musser about what he, as an AFS customer, wanted from his feed mill system.

Musser wanted some specific capabilities from Wilson-Groom. He wanted to be able to create and store his own recipes for his feed mixes, he wanted to be able to adjust his mixes if costs of micronutrients or macronutrients changed, and he wanted a system that could be easily changed as he discovered new functions he wanted included. Unfortunately, while the original plan to build a system based on Microsoft Access combined with a separate application for recipe creation and storage could meet some of these needs, it would not meet all of them.

Wilson-Groom decided on some minimum requirements as they began researching solutions. These requirements included a platform that was not PLC or database management system specific. The project also required a platform that could combine both SCADA and HMI in one product.

Jack Wilson and Bill Groom downloaded and worked with several options, but most were cost prohibitive or lacking flexibility. Eventually, Wilson-Groom discovered InduSoft Web Studio through a prominent magazine that listed award winning SCADA packages. After a call with InduSoft, Wilson said, “For the first time during our search, we talked to a real person who actually wanted to understand our project.” Within a day, Wilson and Groom were on a live webinar with InduSoft, seeing in real-time how InduSoft Web Studio could be used to meet the demands of AFS and Kerek Musser.

Wilson-Groom began developing the InduSoft Web Studio solution for Musser, and found the software intuitive to use, with a good support system to turn to for assistance. Because InduSoft Web Studio has native communication drivers for the Allen-Bradley PLC used in AFS’ feed mill system, connecting everything was an easy process. This enabled Wilson-Groom to spend less time in development than they might have using a less intuitive software solution.

The Solution

The solution developed for Kerek Musser’s Farm and Automated Farm System’s line of products includes not only the originally required functionality, but also additional functions that have proven very beneficial.

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The application created by Wilson-Groom controls ingredient augers, used for mixing chicken and hog feed. The HMI resides on Musser’s home computer, and has an operator interface that allows the user to easily enter batch and ingredient data. The system also shows a graphical representation of the system, and displays alarms. An additional feature provided by Wilson-Groom includes using the email feature to send text messages to the operator in the event that an alarm occurs. The system also makes use of the Secure Viewer thin client for InduSoft Web Studio that allows Musser to use a remote computer on the local intranet. The Web Thin Client allows access to the system via Microsoft Internet Explorer, which allows operators to access the system from nearly anywhere.

This access, coupled with the text message alarms allows operators to correct jams in the feed augers, or restart a stopped batch. Because batches may be queued up to create tons of feed at a time, they take some time to run. The Musser farm is eighty acres, and there is not always an operator to monitor the process located at the HMI computer. The mobile alerts allow the operator to react quickly in responding to jams using the auto/manual switches on the auger. Using the old system, if there was no operator present and the process jammed or stopped, it could not be corrected until someone noticed the issue on the main PC. Alerts are also



Figure 3: The user can monitor the status of the batch sequence. Animated arrows are used to point to the step(s) currently in progress. Many batches can take a few hours to complete. Instead of constantly checking on the status, a “Batch Complete” text message is sent to notify the user.

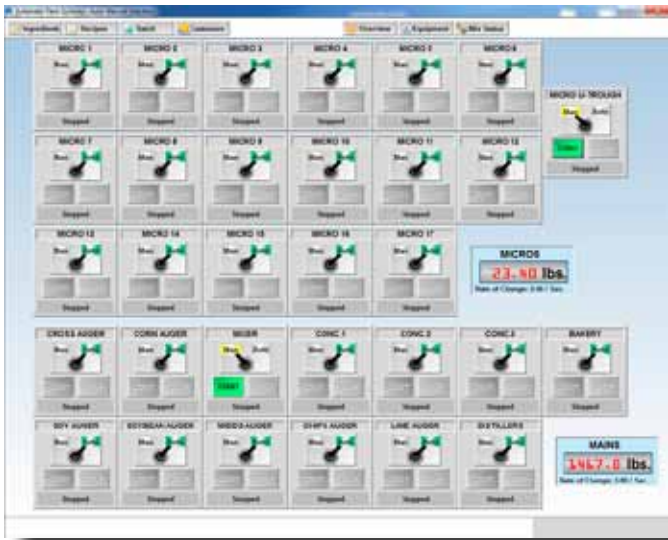


Figure 4: The user can choose to run the equipment in manual for jogging or maintenance purposes.

sent to the phone when a batch is finished, allowing the operator to begin another batch if there is not one queued.

The database connectivity is also a large feature of the application. The database stores ingredient information, inventory, recipes, alarm logs, batch history, mix history, and costs. The application generates valuable reports, and the operator has access to vital information, such as the cost of each batch, and the history of each mix. This information allows a high degree of traceability that allows product tracking from individual ingredients to the end result. Also included in the capabilities of the application are the abilities to log username and password, restrict access to higher functions through security clearance, and logging of changes made to recipes or mixes.

The Result

The results for Wilson-Groom, AFS, and Kerek Musser have been incredibly positive. For Musser, the time spent mixing feed has been reduced by at least 50%, because the application is able to do more than one task at a time. In addition, mobile notifications allow Musser to immediately address problems in the event of a clogged auger or low ingredient. When he's not near his computer, this can save hours of downtime that would otherwise be wasted before he could acknowledge the alarms.

Automated Farm Systems has seen results as well. They now have a proven feed mill application in place that features an off-the-shelf, all in one solution that is highly flexible, scalable, and can be easily changed to reflect the varied needs of their customer base. This makes their product more marketable and more competitive in a market where customers expect features like traceability, and the ability to track each batch from start to finish and get reports on the cost of each mix.

Using InduSoft, Wilson-Groom was able to meet the changing requirements for the project. According to Jack Wilson, "There was never a time when I said 'No, I can't do that'". This application will soon be upgraded to the new version of InduSoft Web Studio, and will feature even more advanced mobile notification through the Enhanced Studio Mobile Access thin client, allowing information about the mixing process to be increasingly portable on devices like the iPad, or smartphones. Since this project, Wilson-Groom has continued to use InduSoft Web Studio, and plans to convert older applications created for clients to InduSoft Web Studio applications.

For more information contact your local distributor or InduSoft directly at info@indusoft.com.

