New Data Collection System for Enhanced Granary Management

The Opportunity

In 2008, Ray Dawson Farms of Brickeys AR determined to build an automated granary operation to expend their farming business. Dawson Farms operates several company owned farms in central Arkansas, as well as performing contract farming for others. The parent company farms additional land as a part of various limited partnerships. The company also purchases grain from other smaller producers in the area.

Dawson had selected a site for the granary approximately 2-1/2 miles from his home and office location. The granary utilized GSI Grain Systems equipment and was erected by Flowers Construction of Elaine, AR.

Dawson Farms had previously been storing grain on the ground in long tubular bags. By adding the grain dryer, automated handling, and the reliability of a more protected storage system, Dawson would be able to increase his sellable crop yields as well as capture much needed accounting data to allow him to better manage the business aspects of the operation.

The crops that are grown include Rice, Wheat, Oats, Corn, Soy Beans, and Milo, which is another name for Grain Sorghum that is used in livestock feed.

All of these products are dried, stored, and re-distributed from the new granary site. The products also needed to be monitored for moisture content. This variable could not only alter the value of the grain to be bought or sold, but it would also determine the degree of drying to be performed, prior to delivering the grain to one the five storage bins.

Dawson Farms also owns and operates (4) company owned grain hauling trucks and in season, contracts with many other independent haulers to deliver grain the site.

With all the possible combinations of buying and selling grain, with varying contracts, land owners, field locations, haulers, crop types, moisture contents, and storage bin locations, Dawson Farms needed a system that would provide the flexibility needed to manage their operations.

The Solution

Ray Dawson contacted his local authorized distributor for Avery Weigh-Tronix scale systems. Ron, the area sales representative, went to the Brickeys site to meet with Ray to determine his needs.

Dawson wanted to integrate a truck scale into the load out area of the granary to monitor loading and un-loading of trucks. This arrangement would provide more accurate weighing whether shipping or receiving grain, without having to maintain tare weights for the vehicles being loaded.

In addition to the scale, he also needed a fully integrated system to capture and report production data from the truck scale. The system needed to be able to capture data from several different means of input and securely maintain the data

in a way that would be easily accessible anywhere on the Dawson Farms network.

Once again, the distributor selected TSW Automation of Nashville, TN to provide the technology portion of the project.

System Features

The turnkey system employs the use of several elements.

Truck Scale

The distributor provided a two platform Avery Weigh-Tronix truck scale that straddled an integral grain dump station. An AWT Model 1310 programmable weight indicator was used to provide load data to the system.

Software

The central component is the PC network based **tWeigh** tm software application that is responsible for data storage and retrieval. It is the heart and soul of the system. Information is entered into the system in a variety of ways. Password protected data can be entered or accessed from anywhere on the Dawson Farms network. Using a notebook computer, Dawson can also connect to the **tWeigh** system via the internet to perform operations or print reports, or do system maintenance.
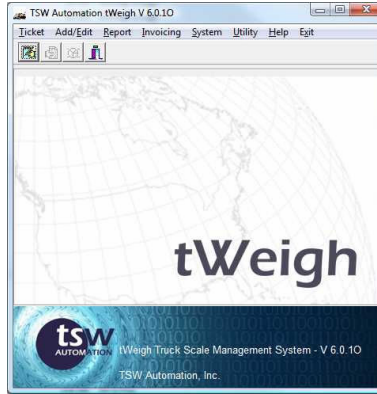
Data Network

The distributed network is made up of the following components. Internet access to the new granary needed to be provided wirelessly. The main office local network, and the granary site network connection, was provided using a (2-1/2 mile) 900 MHz point to point Wireless Ethernet Bridge.

The existing main office was already connected to satellite Internet access via HughesNet, the local internet service provider.

The new installation at the granary provided for wired Ethernet, and 802.11 b/g wireless Ethernet located at the **tPanel** to support truck mounted **t700** data input terminals.

tPanel Operator Interface

The central interface point for truck drivers entering the scale is the **tPanel** operator's kiosk.

The **tPanel** kiosk has several key features. The central component is the 8" color touch panel display. It provides a Bi-Lingual interface with the operator for every function to be performed. A Stainless Steel vandal proof keyboard is provided for reliable data entry.

An 80 mm wide thermal ticket printer is installed to provide drivers with multiple transaction tickets for the driver as well as the crop owner. Duplicate transaction tickets can also be printed to any other standard laser printer(s) located on the Dawson Farms network.

The system also includes a traffic light, with pole mount weight display. The traffic light gives the driver a visual confirmation that the transaction has been completed, and that it is now ok to exit the scale.


RFID Card Reader

The kiosk also includes an RFID (Radio Frequency Identification) card reader. This reader reads the encrypted number embedded in a pre-programmed credit card that will deliver load information to the kiosk in one quick swipe.

The driver simply presents the card within 4" of the gray reader to the right of the screen, and all the transaction data is displayed for his approval on the screen. A network based software utility is used to pre-program the cards by number from the office, with a pre-selected set of

load parameters including Crop, Farm, Bin, Truck #, Etc.
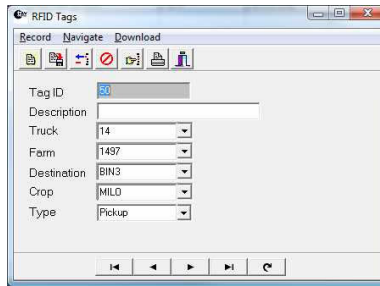
These cards are used for independent, or contract drivers, whose load and crop information varies from day to day, or load to load.

t700 Mobile Data Terminal

For company owned trucks that are dispatched to a wide variety of locations to pick up and deliver loads, the system uses the TSWA, **t700** Mobile Data Terminal.

The terminal is a self contained wireless network device that can be moved from truck to truck by simply applying power via. the truck's cigarette lighter port or other pre-wired power location. The crop data can be entered in the field by the driver or field foreman. In the event that an un-trained driver is operating a truck, the driver can simply drive by in range of any wireless access point on the network and an attendant can access the **t700** remotely to set up the next load.

The password protected data is maintained in memory until it is changed again so that the driver can

deliver multiple loads so as long as the crop or location information does not change. When the driver pulls on to the scale, the terminal automatically connects to the wireless network, to transfer his load information he simply presses the F1 (*Scale*) key.
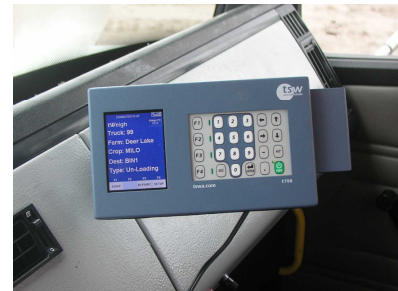
When the loading or unloading is complete, he will press a key to allow the system to process the weighment, complete the transaction and print the tickets. A re-print button is provided in case the driver needs an additional copy.

Whether the driver is a walk up delivery person, or a contract driver with a RFID Card, or a company truck with a cab mounted data terminal, all the load data is reliably processed and stored into the **tWeigh** system.

Data Management Features

Once the production data was captured at the granary scale, Dawson also needed a means of reporting that data in a useable format to meet his needs. The Dawson Farms accounting manager not only has to calculate product costs and profitability, but is responsible for the paying and invoicing of partners, customers, land owners, truck operators and others involved in the operation of the business.

The **tWeigh** system allows the user to calculate product volumes based upon weight and moisture content. The inventory levels in the bins are automatically adjusted to reflect loss of weight due to

moisture loss in the drying process.
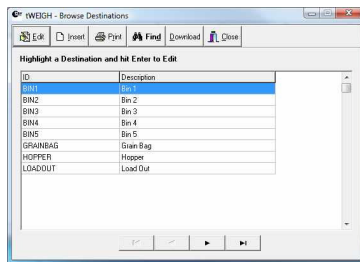
Inventory levels are expressed as both weight and estimated bushels. Inventory levels are also maintained whether shipping from, or receiving grain to the site.
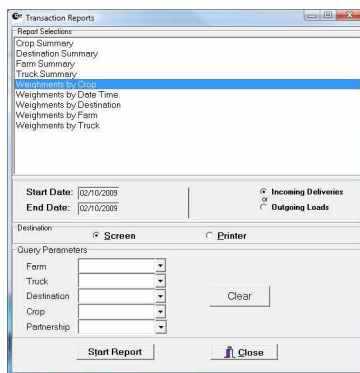
The **tWeigh** system provides flexible reporting options and additional Accounting package exporting features to make that possible. Reports can be generated by Date, Crop, Owner, Contract, Field, Driver, Truck, Etc. **tWeigh** will also export data to Excel, Peachtree, Quick Books, or most other standard, as well as custom accounting packages.

Continued TSWA Support

Altough the local distributor remains the first line of support, **TSWA** continues to provide web enabled support to Dawson Farms. By directly connecting to the **tWeigh** server via the web, **TSWA** engineers are able to assist Dawson Farms as easily as if they were there on site. Software upgrades and modifications can be installed to the server programs, **tPanel,** and cab mounted **t700** units remotely in a matter of minutes.

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