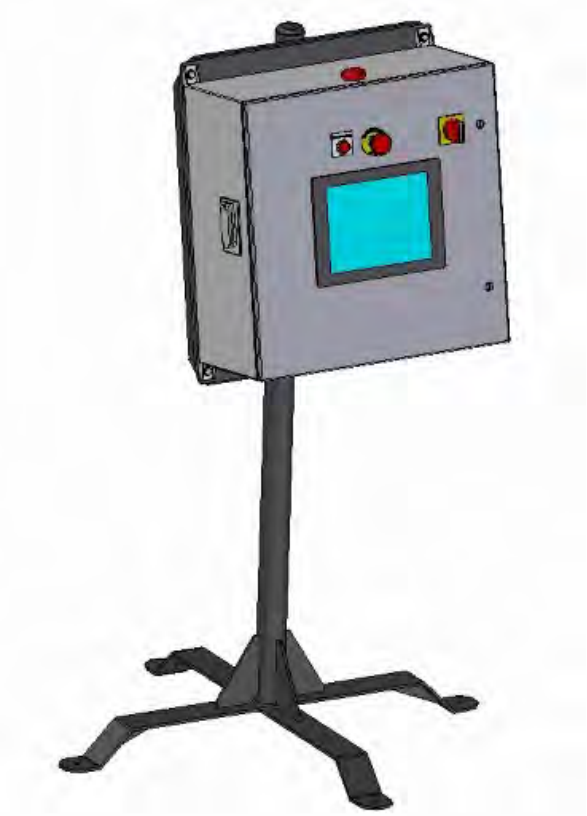
U-Treat Automation

Operators Manual

Covering automation for the LPX Treater, Batch Hopper and Tri - Flo®



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INTRODUCTION

Thank you for choosing USC, LLC for your equipment needs. We appreciate your business and will work diligently to ensure that you are satisfied with your choice.

OVERVIEW

The purpose of this manual is to provide you with the basic information needed to operate and maintain the U-Treat Automation. It does not hold USC, LLC liable for any accidents or injuries that may occur.

OPERATOR RESPONSIBILITIES

As the purchaser/owner/operator of this equipment and control system, you have an obligation to install, operate, and maintain the equipment in a manner that minimizes the exposure of people in your care to any potential hazards inherent in using this equipment. It is critical that the owner of this equipment:

- Has a clear and documented understanding of the process this machine is being used in and of any resulting hazards or special requirements arising from this specific application.
- Allow only properly trained and instructed personnel to install, operate or service this equipment.
- Maintain a comprehensive safety program involving all who work with this machine and other associated process equipment.
- Establish clear areas of staff responsibility (e.g. operation, setup, sanitation, maintenance, and repairs).
- Provide all personnel with necessary safety equipment.
- Periodically inspect the equipment to insure that the doors, covers, guards, and safety devices are in place and functioning, that all safety instructions and warning labels are intact and legible, and that the equipment is in good working order.
- In addition to the operating instructions, observe and enforce the applicable legal and other binding regulations, national and local codes.

As the person with the most to gain or lose from working safely, it is important that you work responsibly and stay alert. By following a few simple rules, you can prevent an accident that could injure or kill you or a co-worker.

- Do not operate, clean, or service this equipment until you have read and understood the contents of this manual. If you do not understand the information in this manual, bring it to the attention of your supervisor, or call USC at (785) 431-7900 for assistance.
- Any operator who is known or suspected to be under the influence of alcohol or drugs should not be allowed to operate the equipment.
- Understand and follow the safety practices required by your employer and this manual.
- **PAY ATTENTION** to what you and other personnel are doing and how these activities may affect your safety.
- **Failure to follow these instructions may result in serious personal injury or death.**

RECEIVING YOUR EQUIPMENT

As soon as the equipment is received, it should be carefully inspected to make certain that it has sustained no damage during shipment and that all items listed on the packing list are accounted for. If there is any damage or shortages, the purchaser must immediately notify USC, LLC. Ownership passes to purchaser when the unit leaves the USC, LLC. premises. The purchaser is responsible for unloading and mounting all components of the equipment.

Document the serial number of the machine for future reference. The serial number is located on the in the upper right hand corner of the control panel.

SERIAL NUMBER:_____

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SECTION A SAFETY INSTRUCTIONS

Every year accidents in the work place maim, kill and injure people. Although it may be impossible to prevent all accidents, with the right combination of training, operating practices, safety devices, and operator vigilance, the number of accidents can be significantly reduced. The purpose of this section is to educate equipment users about hazards, unsafe practices, and recommended hazard avoidance techniques.

If any of the required regularly scheduled maintenance is located above the reach of the operator, they should follow the companies normal safe practices of reaching that particular height, utilizing the companies specified equipment and following normal safety precautions.

When working with treatment chemicals, operators should always wear protective gloves, safety glasses, and follow the companies safety precautions in the case of any spillage or operator contamination.

SAFETY WORDS AND SYMBOLS

It is very important that operators and maintenance personnel understand the words and symbols that are used to communicate safety information. Safety words, their meaning and format, have been standardized for U.S. manufacturers and published by the American National Standards Institute (ANSI). The European Community (E.C.) has adopted a different format based on the International Standards Organization (I.S.O.) and applicable machinery directives. Both formats are presented below. Graphic symbols are not standardized, but most manufacturers will use some variation of the ones seen in this manual.

Indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

Indicates a potentially hazardous situation which, if not avoided, **may** result in minor or moderate injury and/or property damage.

Provides additional information that the operator needs to be aware of to avoid a potentially hazardous situation.

Mandatory Lockout Power Symbol. Disconnect, lockout and tagout electrical and other energy sources before inspecting, cleaning or performing maintenance on this panel.

International Safety Alert Symbol. The exclamation point (!) surrounded by a yellow triangle indicates that an injury hazard exists. However, it does not indicate the seriousness of potential injury. The exclamation point (!) is also used with the DANGER, WARNING and CAUTION symbols so the potential injury is indicated.

Electrocution Hazard Symbol. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

International Electrocution Hazard. This symbol indicates that an electrocution hazard exists. Serious injury or death could result from contacting high voltage.

Mandatory Read Manual Action Symbol. (I.S.O. format) This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Mandatory Read Manual Action Symbol. This symbol instructs personnel to read the Operators Manual before servicing or operating the equipment.

Notice is used to notify people of important installation, operation or maintenance information which is not hazard related.

LOCKOUT / TAGOUT PROCEDURES

Lockout/Tagout is the placement of a lock/tag on an energy isolating device in accordance with an established procedure. When taking equipment out of service to perform maintenance or repair work, always follow the lockout/tagout procedures as outlined in ANSI Z344.1 and/or OSHA Standard 1910.147. This standard "requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energizing, start-up, or release of stored energy in order to prevent injury to employees."

EMERGENCY STOP

There are Emergency Stop push buttons located on the Main Control Panel, Treater Control Panel, Tri-Flo® Control Panel and the Bin Site Control Panel. Actuators of emergency stop shall be colored RED. The background immediately around the device actuator shall be colored YELLOW. The actuator pushbutton operated device shall be of the palm or mushroom head type.

CONTROLLED STOP

This is the stopping of machine motion by reducing the electrical command signal to 0 (zero) once the stop signal has been recognized. The operator initiates this stop by pressing the PAUSE button at he bottom of the main screen.

HAZARD REVIEW

Electrocution Hazard

Electrocution accidents are most likely to occur during maintenance of the electrical system or when working on or near exposed high voltage wiring. This hazard does not exist when the electrical power has been disconnected, properly locked, and tagged out.

Automatic Start Hazard

This equipment may be controlled by an automated system and may start without warning. Failure to properly disconnect, lockout, and tagout all energy sources of remotely controlled equipment creates a very hazardous situation and could cause injury or even death. PLEASE STAY CLEAR AND BE ALERT.

YOU are responsible for the **SAFE** operation and maintenance of your USC, LLC equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alert you to good safety practices that should be adhered to while operating the equipment

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Equipment owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

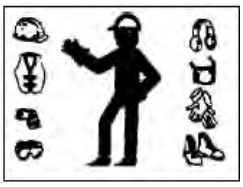
GENERAL SAFETY

1. Read and understand the operator's manual and all safety signs before operating, maintaining, adjusting or unplugging the equipment .

2. Only trained persons shall operate the equipment . An untrained operator is not qualified to operate the machine.
3. Have a first-aid kit available for use should the need arise, and know how to use it.

4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.

5. Do not allow children, spectators or bystanders within hazard area of machine.
6. Wear appropriate protective gear. This includes but is not limited to:



   - A hard hat
   - Protective shoes with slip resistant soles
   - Protective goggles
   - Heavy gloves
   - Hearing protection
   - Respirator or filter mask

7. Place all controls in neutral or off, stop motor, and wait for all moving parts to stop. Then disable power source before servicing, adjusting, repairing, or unplugging.

8. Review safety related items annually with all personnel who will be operating or maintaining the equipment.

OPERATING SAFETY:

1. Read and understand the operator's manual and all safety signs before using.
2. Disconnect and disable electrical supply completely and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Clear the area of bystanders, especially children, before starting.
4. Be familiar with the machine hazard area. If anyone enters hazard area, shut down machine immediately. Clear the area before restarting.
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Stay away from overhead obstructions and power lines during operation and transporting. Electrocution can occur without direct contact.
7. Do not operate machine when any guards are removed.
8. Inspect welds and repair if needed.

PLACEMENT SAFETY

1. Move only with the appropriate equipment
2. Stay away from overhead power lines when moving equipment. Electrocution can occur without direct contact.
3. Be familiar with machine hazard area. If anyone enters hazard areas, shut down machine immediately. Clear the area before restarting.
4. Operate the equipment on level ground free of debris. Anchor the equipment to prevent tipping or upending.

Before placement of the equipment , be sure that ground is reasonably level. The equipment may topple or work improperly if the ground is too uneven, damaging the equipment and/or causing personal injury.

MAINTENANCE SAFETY

1. Review the operator's manual and all safety items before working with, maintaining or operating the equipment .
2. Place all controls in neutral or off, stop motors, disable power source, and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:

   Keep service area clean and dry.
   Be sure electrical outlets and tools are properly grounded.
   Use adequate light for the job at hand.
4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
6. Before resuming work, install and secure all guards when maintenance work is completed.
7. Keep safety signs clean. Replace any sign that is damaged or not clearly visible.

SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Replacement safety signs are available. Contact USC at (785) 431-7900 .

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

Located on the USC equipment you will find safety labels. Always be sure to read and follow all directions on the labels.

Part # 09-02-0001

Part # 09-02-0002

Guards provided with USC equipment are to remain in place during operation.

INSTALLATION

SECTION B

HIGH VOLTAGE ~ Always disconnect the power source before working on or near the control panel or lead wires.

HIGH VOLTAGE ~ Use insulated tools when making adjustments while the controls are under power.

Permanent installation may require additional electrical cords, chemical tubing, and air lines, since each installation is unique.

USC equipment operates within a group II class G hazardous area which contains seed dust. To avoid the possibility of an explosion ignited by static electricity, all USC equipment should be grounded by attaching a bonding strip to the metal frame and securing that strip to the factory ground point.

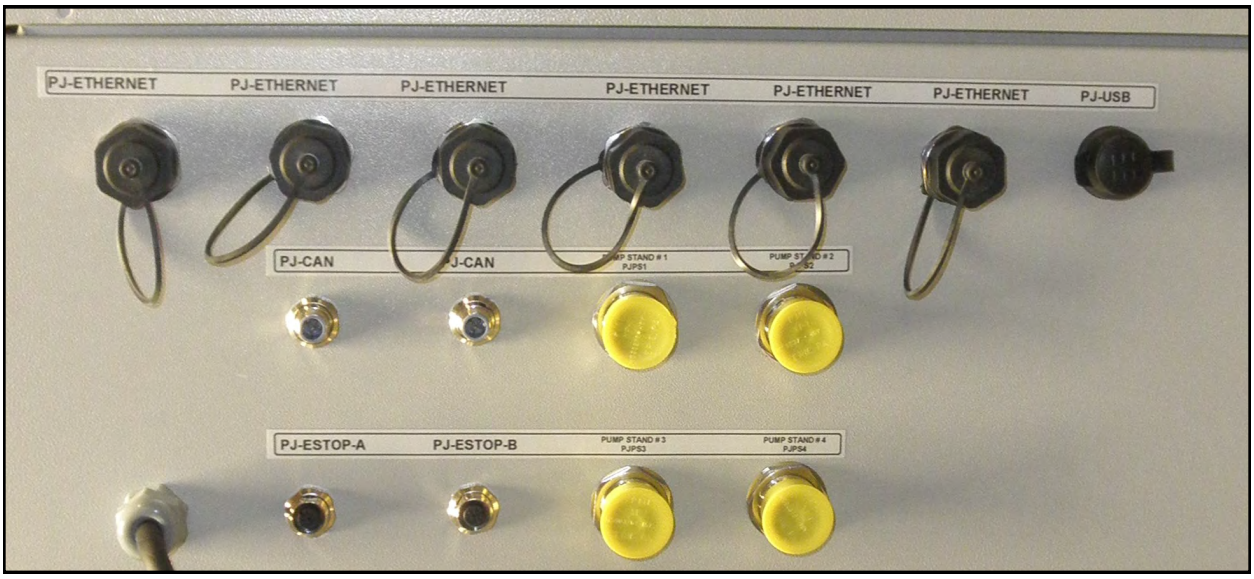
If labeled accordingly, USC products are designed to comply with CSA 22.1 for use in a class II, Division 1 & 2, group G environment. When connecting the USC system power cord into a power supply, first determine if the supply is also within the hazardous area where the USC system is located. If so, we recommend that the power be hard wired into the source. Do not use a standard electrical plug for this purpose. For other acceptable methods of connecting to a power source, or any other additional miscellaneous equipment to the USC system within a hazardous location, please consult CSA 22.1, Section 18-200 and 18-274. Review the appropriate section and ensure compliance with one of the options given.

When connecting to USC equipment from a remote location, and the USC equipment is in a hazardous class II group G environment, customers are advised to follow the requirements within CSA 22.2 no. 25. More details may also be found in CSA 22.1 18-252 (wiring methods). There are various options covered within this section for wiring in a class II, group G (dust) environment. Select the best method suited for your specific location.

INSTALLATION

1. Attach the Main Control Panel to the control panel stand using the provided hardware. Determine the permanent location you will be operating the system from, then anchor the stand to the floor. The panel may also be mounted to a wall.
2. Connect the gray cable with light blue ends to one of PJCAN connectors on the bottom of Main Control Panel to one of the PJCAN connectors on the bottom of the Treater Control Panel. If using with a Tri-Flo® and or Bin Site control panel, continue to daisy chain from one panel to the next until all panels are connected. Connect the two light blue plugs into each of the remaining open PJCAN connectors on the last panel.
3. Connect the red cable to the PJESTOPA on the Main Control Panel and then to the PJESTOPB on the Treater Control Panel. This cable must run from an A connection to a B connection (never A to A or B to B). If using with a Tri-Flo® and or Bin Site control panel, continue to daisy chain from one panel to the next until all panels are connected. Connect the two red plugs into each of the remaining open PJESTOP connectors on the last panel.
4. Connect the cables from Pump Stand(s) to applicable port on the Main Control Panel.
5. If using a scale printer, plug the printer communication cable into one of the available Ethernet ports located on the bottom of the main control panel. The printer must be located in a safe area. Do not use within a hazardous area which contains seed dust.

MAIN CONTROL PANEL



ELECTRICAL OPERATION

SECTION C

HIGH VOLTAGE ~ Always disconnect the power source before working on or near the control panel or lead wires.

HIGH VOLTAGE ~ Use insulated tools when making adjustments while the controls are under power.

AUTHORIZED PERSONNEL only shall work on the control panel. Never allow anyone who has not read and familiarized themselves with the owner's manual to open or work on the control panel.

This section provides a general overview and description of the general operator controls.

USC recommends the use of surge protection device with a minimum rating of 700VA for all Automated Main Control Panels.

General Panel Descriptions

- The LPX Automated Main Control Panel (AKA Main Control Panel) is a plug connected enclosure that contains the PLC (Programmable Logic Controller) as well as the HMI (Human Machine Interface) touch screen. The operator is able to control the entire system through the HMI. Power to this panel is supplied from a standard 110V plug. (Always on site)

- The LPX Treater Main Panel is an enclosure that is attached to the side of the treater and contains the electrical components required to actuate the seed treater. This includes the VFDs for the seed wheel and atomizer. Power for the treater is supplied here. Power to this panel is hard wired. (Always on site)

- The LPX Automated Pump Stand Panel is a plug connected enclosure that is located on each pump stand frame. This panel connects the pump stand electrical components to the Automated Main Control Panel. Each pump stand has two standard 110V plugs. One for the manual ON/OFF switch controlling the mix tank motor and one for the pump stand control panel. (Optional panel=pump stand configuration options vary)

- The Bin Site Control Panel (BSCP) is a 36 x 30 x 10 inch enclosure that contains the bulk of the electrical control components. The air solenoid bank that controls the Batch Hopper slide gate valve and the bin slide gate valves is located on the side of this panel and hardwired to the BSCP. (Optional panel-only present on sites with bin site)
- The Tri - Flo ® Control Panel (TFCP) is a plug connected enclosure that is located on the Tri - Flo ®. This enclosure contains the electronic components for the Tri - Flo ®. (Optional panel-only present with Tri - Flo ® weigh system)

GENERAL AUTOMATION

SECTION C1

HMI-Main Control Panel

This section explains the function of the touch screen controls that apply to all systems.

USC STARTUP SCREEN

This is the first screen the operator will see after the system receives power. Touch this screen to allow the operator to advance to the Main screen.

The main screens vary depending on the system being run. Please see specific sections for breakdown of the main screen button descriptions.

- Treater main screen description: pg. 30
- Batch Hopper main screen description: pg. 40
- Tri - Flo ® main screen description: pg. 50

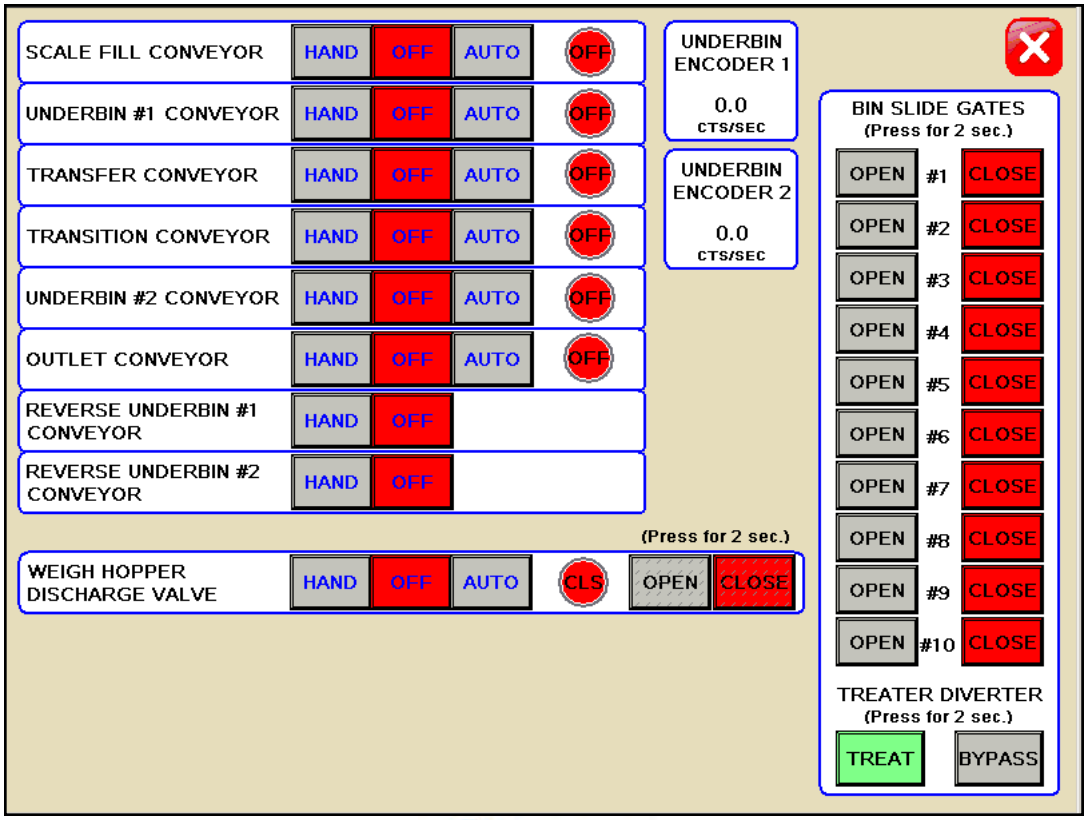
H-O-A (HAND-OFF-AUTO) SCREEN

Hand-Off-Auto controls are provided for most of the automated devices in the system, and are accessed on this screen.

These H-O-A buttons force the selected component to be energized (HAND), de-energized (OFF), or automatically energized by the normal logic sequence (AUTO). The HAND function will cause the component to operate independent of whatever else the system is trying to do automatically. These functions should not normally be used if the automated sequencing is active. **Be sure to understand the impact of energizing or de-energizing a component with the HAND/Off settings before using them. These commands are not a substitute for Lockout/Tagout procedures when working on or near this machine. Use proper lockout/tagout procedures to disable the equipment before servicing it.**

These screens vary depending on the system being run. Please see specific sections for breakdown of the H-O-A button descriptions. (Example below)

- Treater H-O-A description: pg. 34
- Batch Hopper H-O-A description: pg. 44
- Tri - Flo ® H-O-A description: pg. 55

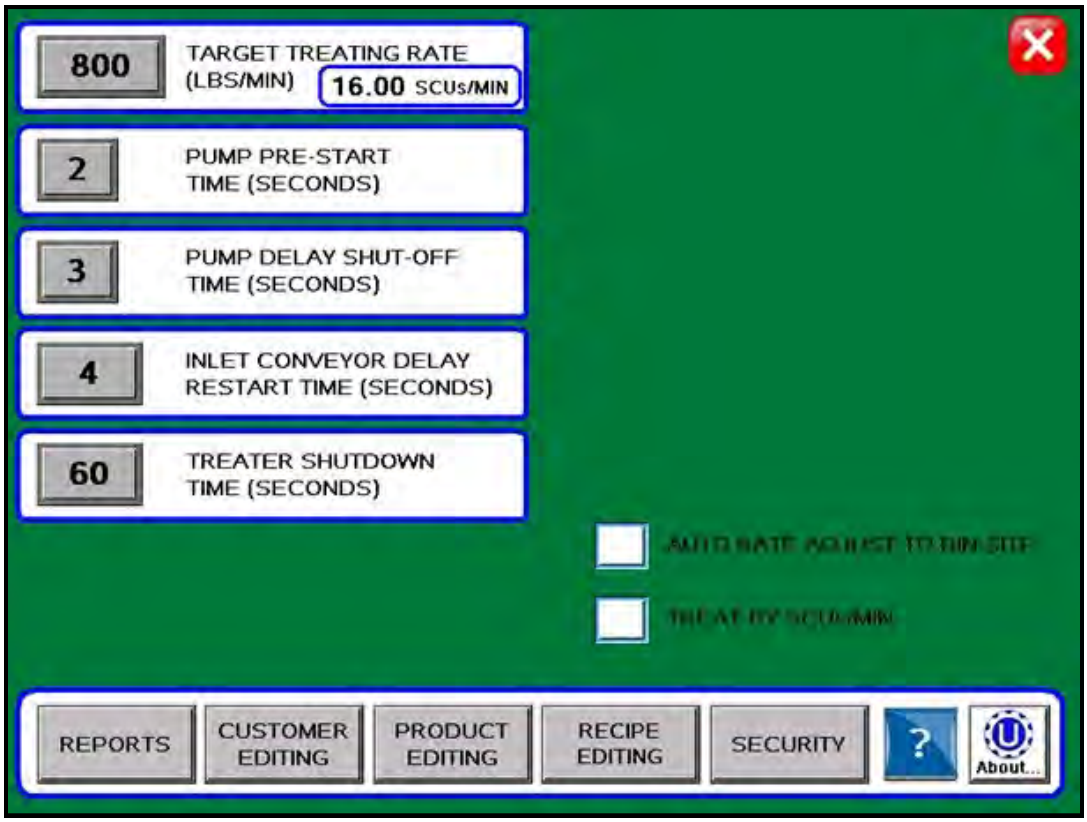


UTILITIES SCREEN

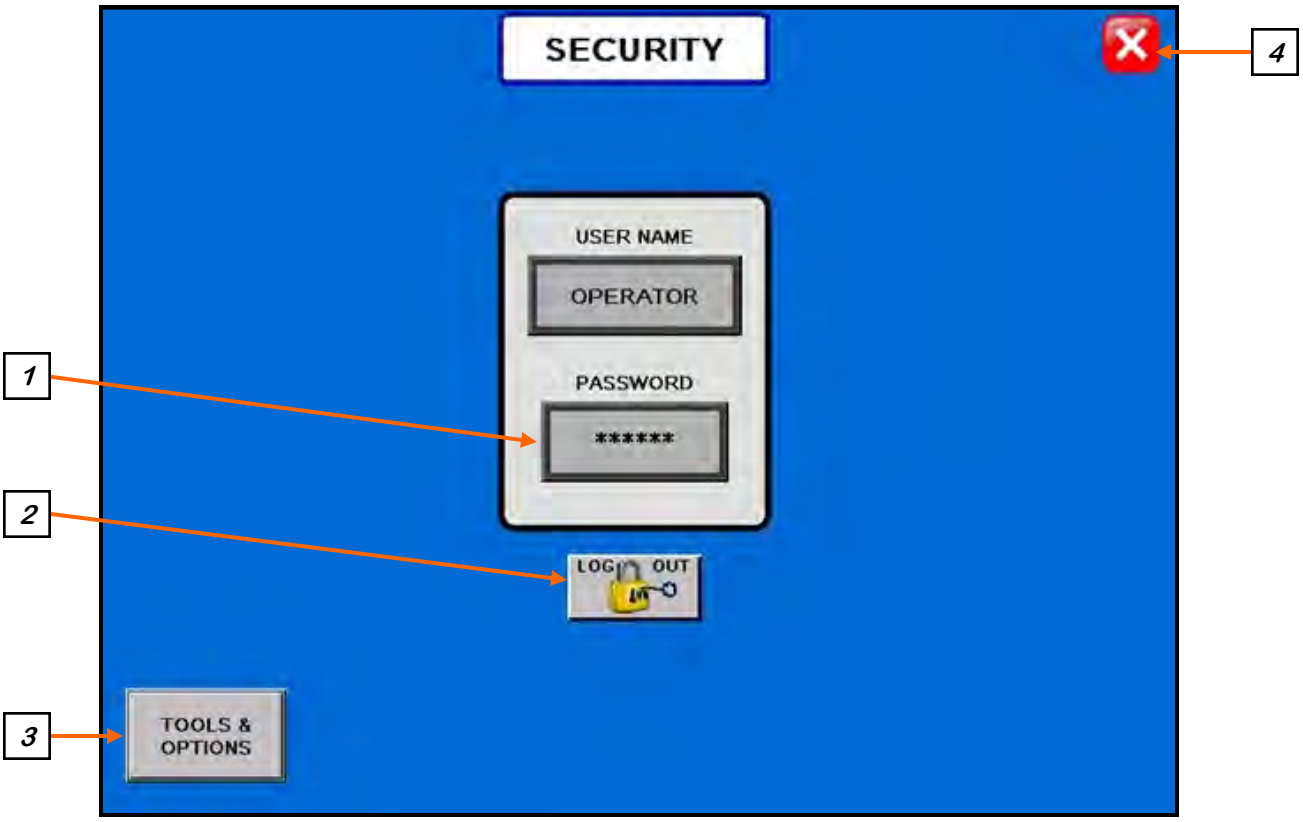
This screen allows the operator to set various system parameters and gives access to the Reports, editing various data, Security, Help Screens and General Information.

These screens vary depending on the system being run. Please see specific sections for breakdown of the Utilities Screen descriptions. (Example below)

- Treater Utilities description: pg. 38
- Batch Hopper Utilities description: pg. 48
- Tri - Flo ® Utilities description: pg. 59



SECURITY SCREEN



Security Screen Button Descriptions

1. PASSWORD ENTRY: The operator uses this input to obtain access to all options on this screen. When this button is pressed a keypad (below) will appear on the screen The password is **USC** and should only be made accessible to personnel qualified to operate the system. The User Name will stay OPERATOR.

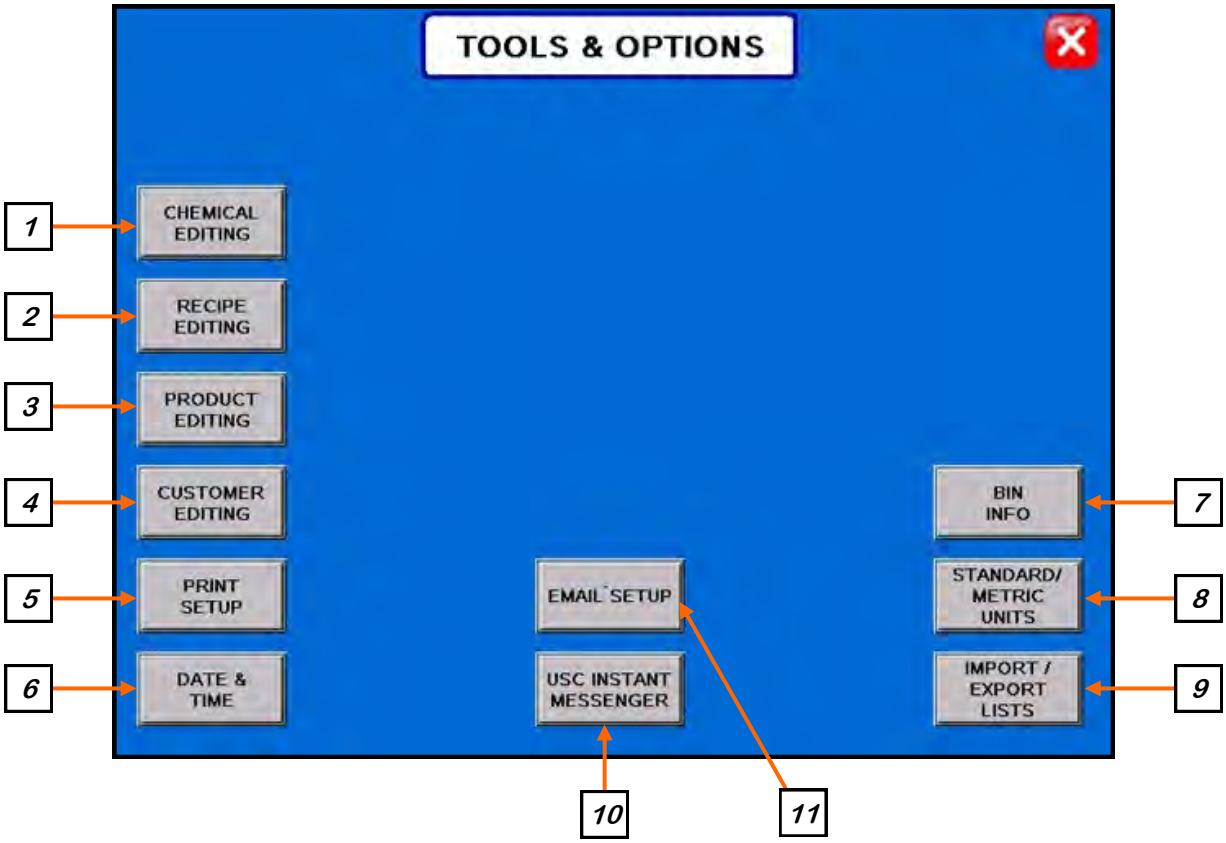
Security Screen Button Descriptions (cont'd)

2. LOGOUT BUTTON: Pressing this button will log the operator out of the Security screen.

3. TOOLS & OPTIONS: Pressing this button will advance the operator to the Tools & Options screen.

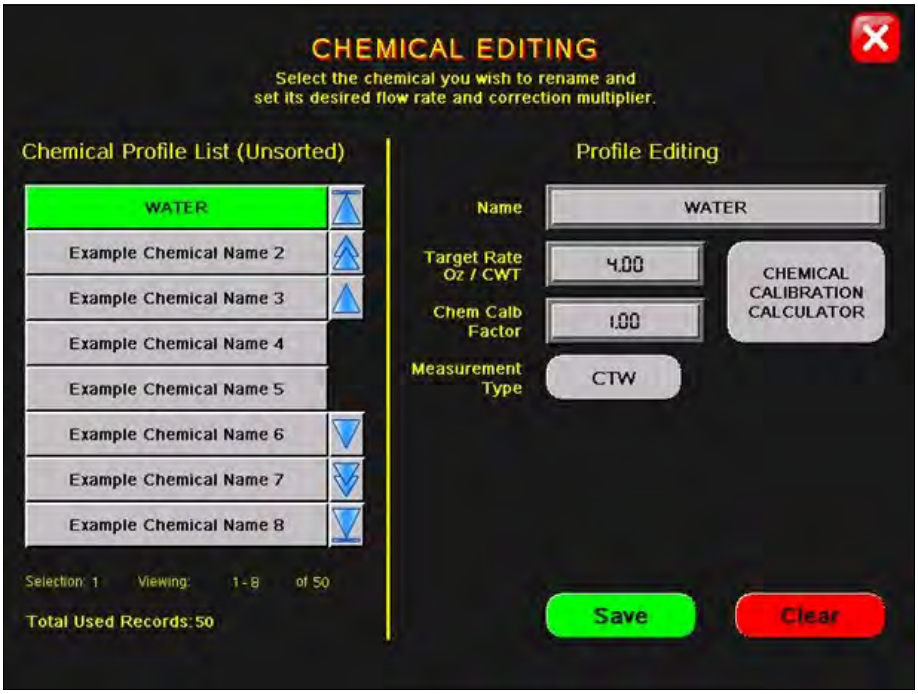
4. SCREEN EXIT BUTTON: Pressing this button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

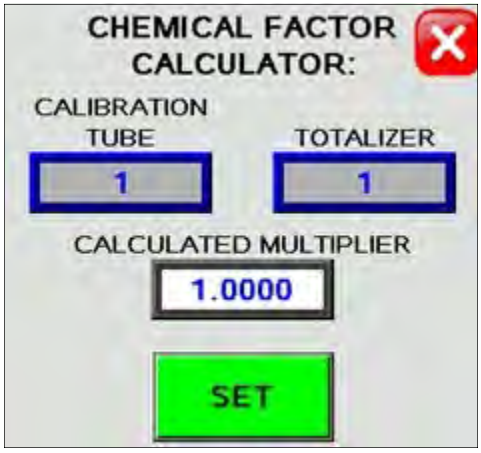
TOOLS & OPTIONS SCREEN



Tools & Options Screen Button Descriptions

1. CHEMICAL EDITING: Allows the operator to change the chemical information to better fit their needs. Pressing this button will advance the operator to the Chemical Editing screen. Selecting a Chemical on the left brings up the chemicals information on the right. This is where the operator can change information such as the name, target rate, calibration factor and rate measurement type. This screen also includes the Chemical Calibration Calculator button that will take the user to a popup window (bottom). From this screen the operator can determine the chemical multiplier by entering the Calibration Tube amount and the Totalizer amount. Press SET and the multiplier is automatically calculated and entered in the selected profile Chem Calibration Factor box. Operator must hit SAVE or any changes made to the selected profile will be lost when leaving that profile or screen.

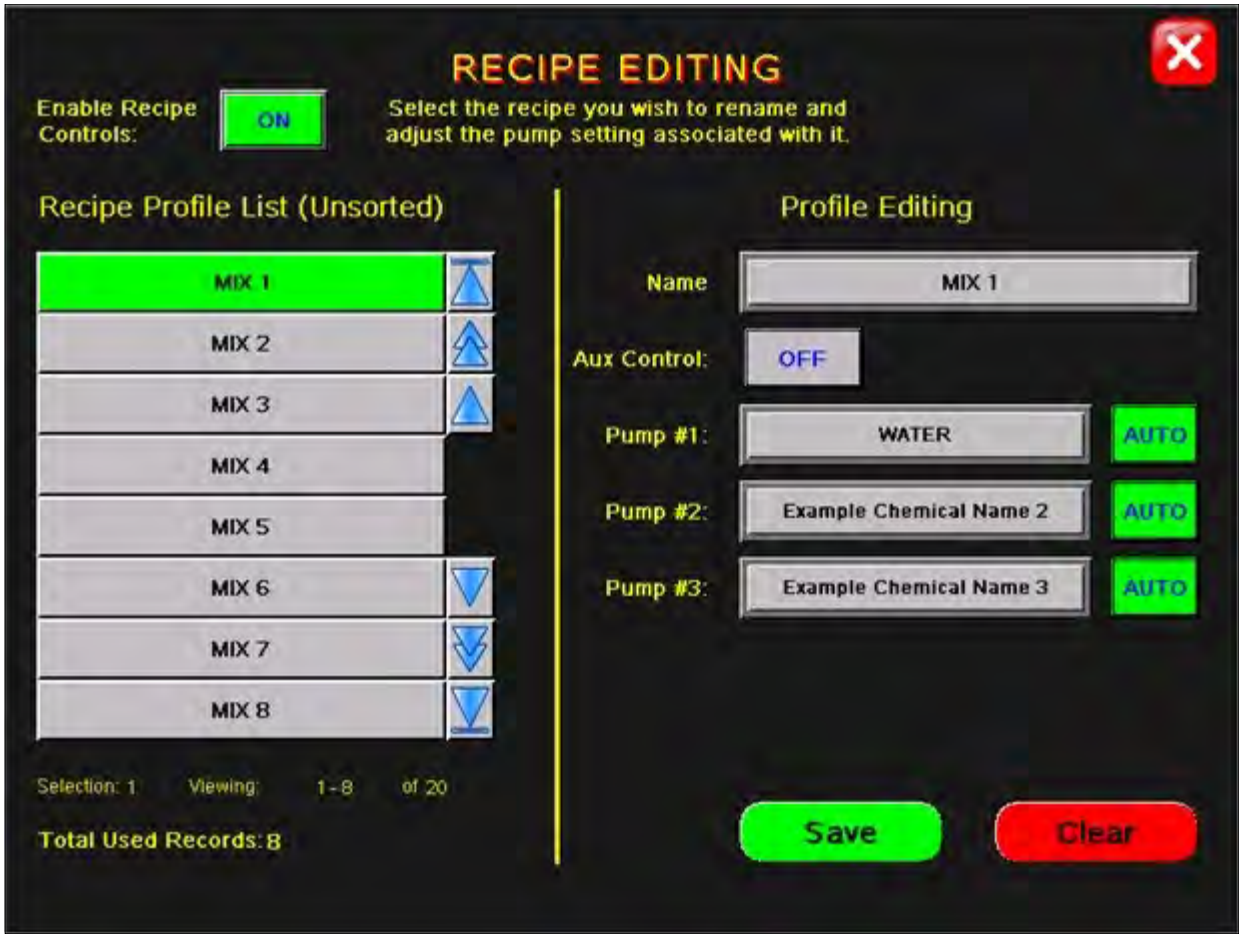




Tools & Options Screen Button Descriptions

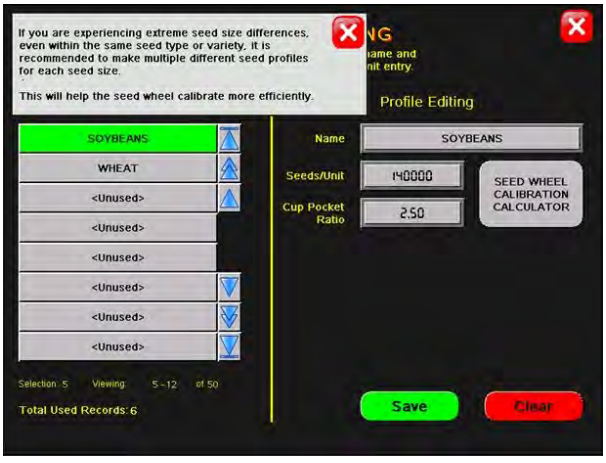
2. RECIPE EDITING: Allows the operator to change the chemical recipe information. Pressing this button will advance the operator to the Recipe Editing screen. Selecting a recipe on the left brings up the details on the right. This is where the operator can change information such as the name, auxiliary control and what pumps will be active and the chemical of that pump. This screen also includes the Enable Recipe Control button that allows the user to turn the recipe option on or off.

NOTE: When the recipe controls is on you will select a recipe from the startup wizard screen before starting a run.



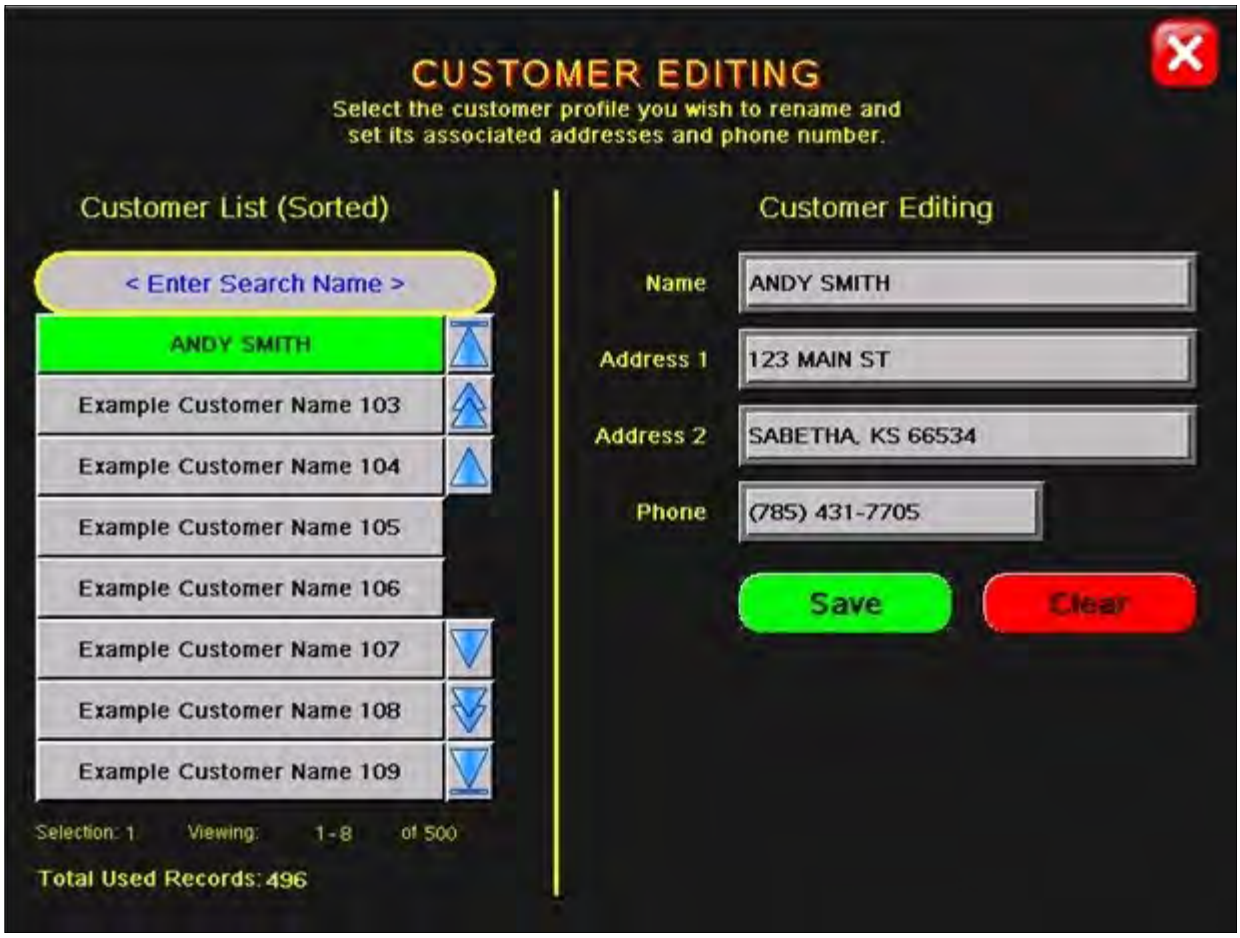
Tools & Options Screen Button Descriptions

3. PRODUCT EDITING: Pressing this button will advance the operator to the Product Editing screen. Select one of the product name buttons on the left to display its data on the right where the operator can edit the name, seeds per unit and cup pocket ratio. You will also find the Seed Wheel Calibration Calculator button here that will open a popup (bottom left) where the operator can enter the actual scale weight and totalizer weight and hit APPLY. The system will update the cup pocket ratio based on this calculation. There is also a Calibrating Seed button on the top left of the Product Editing screen that when pressed will produce a popup (bottom right) for instructions on when to make multiple profiles for the same type of seed you may have.



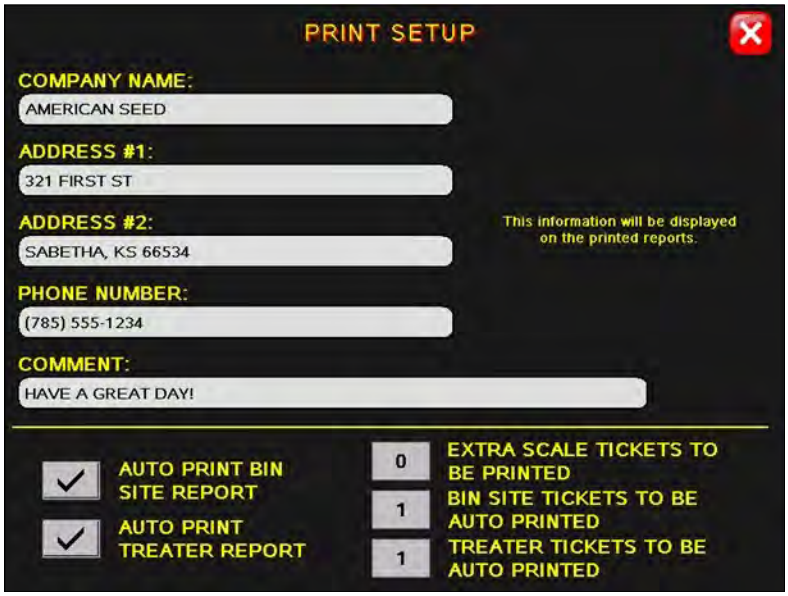
Tools & Options Screen Button Descriptions

4. CUSTOMER EDITING: Pressing this button will advance the operator to the Customer Editing screen (bottom). If you are looking for a specific customer you may press the < ENTER SEARCH NAME> button and key in the name or use the arrows to scroll through the listing. Select an unused block to add a new customer to the list by entering their information on the right side of the screen. After the new customers information has been entered press the SAVE button. If there is a customer in the list that has the name entered the SAVE button will be locked and you will be unable to save the entry. You must provide a unique name for each entry. If you enter a new customer and navigate away from that profile without hitting the SAVE button it will NOT be saved.

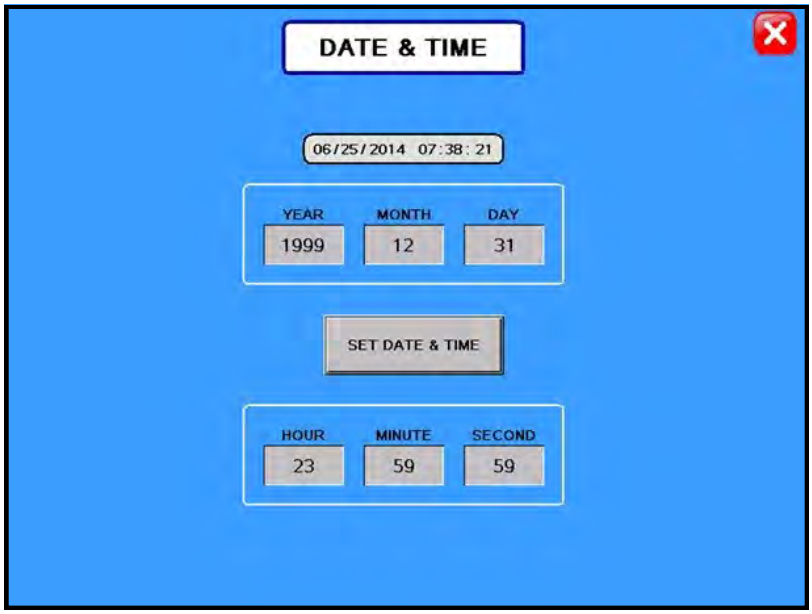


Tools & Options Screen Button Descriptions

5. PRINT SETUP: Allows the operator to set up their personal company information which will be printed at the top of each report. Pressing this button will advance the operator to the screen below. The company information can be entered by selecting the blank space under each heading. The operator may also check the Auto Print box to print a report for a customer every time a report is generated as well as how many copies the customer requires.



6. DATE & TIME: Allows the operator to set the date and time.



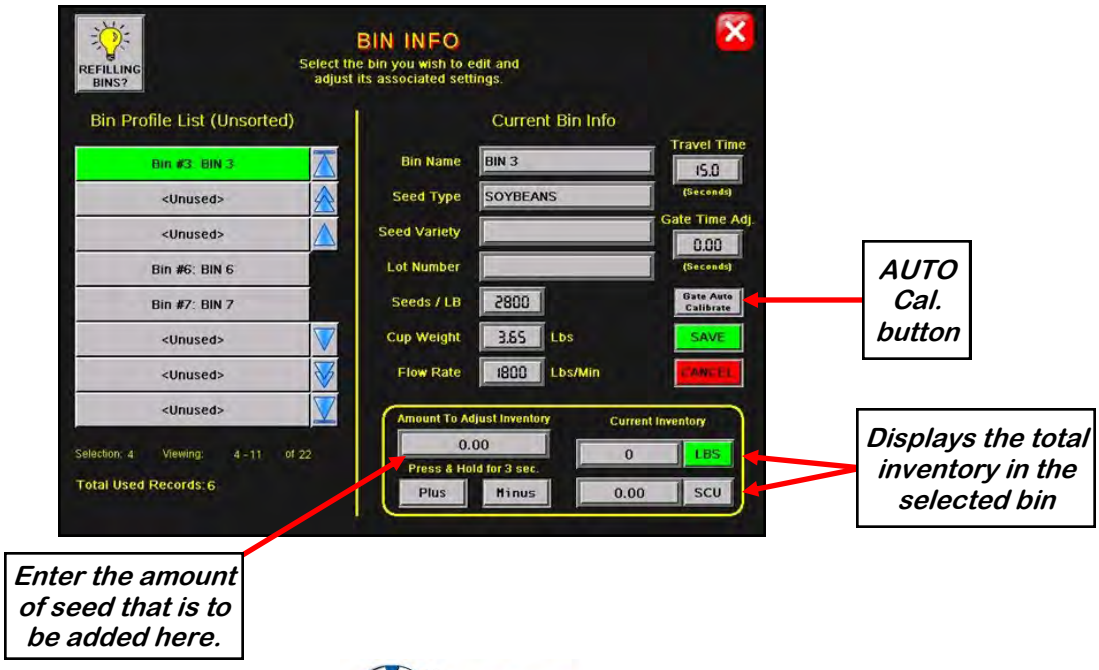
Tools & Options Screen Button Descriptions

7. BIN INFO: Pressing this button will advance the operator to the Bin Info screen. This screen allows the operator to select a particular bin and enter the information for the seed that will be loaded into it. Select the bin from the Select Bin list on the left side of the screen. Select the Seed Type field and a drop down menu displays the seed types entered in the Product Name screen. Select Seed Variety, Lot Number, Seeds / Pound or Cup Weight and a numeric keypad appears to allow you to enter their values. After entering all the information the SAVE button must be pressed for the bin site system to retain the information.

On this page you will also find the Flow Rate and Travel Time. These indicators show the flow rate and travel time but unlike the indicators on the main screen these are also active buttons allowing the operator to make a temporary adjustment to bring the run totals to the desired amount. Push the FLOW RATE button and increase or decrease the pounds per minute, then select the Gate Auto Calibration button and the system automatically adjusts the duration the bin slide gate stays open. The number of seconds needed to compensate is then displayed in the Gate Time Adj. field. The operator may also manually change these parameters.

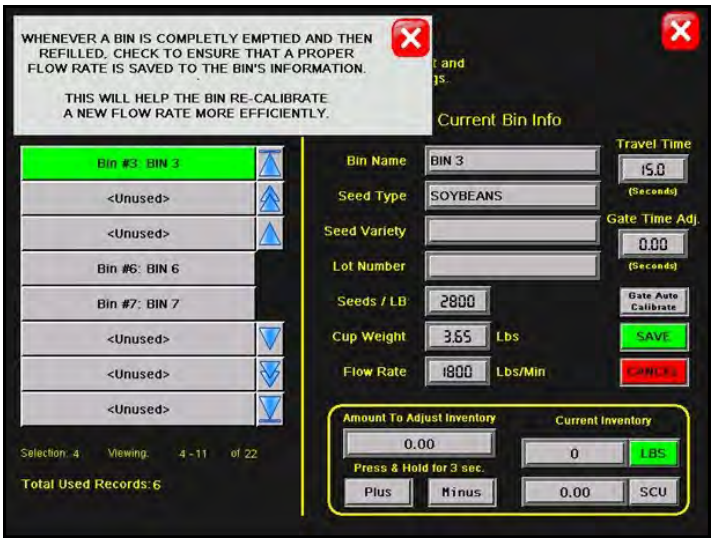
The inventory of the bin may also be entered on this screen. Enter the amount of inventory that is to be added or subtracted into the Amount to Adjust Inventory box and then press and hold the "+" or the "-" box for 3 seconds. The total amount of inventory in the bin will be displayed to the right under current inventory. Make sure if you are adjusting by pounds the LBS button on the inventory side is green or if entering by units the SCU button is green so that the calculations are correct based on the measurement type.

(Note: This button will not be an option if the system is set up only to run a treater.)

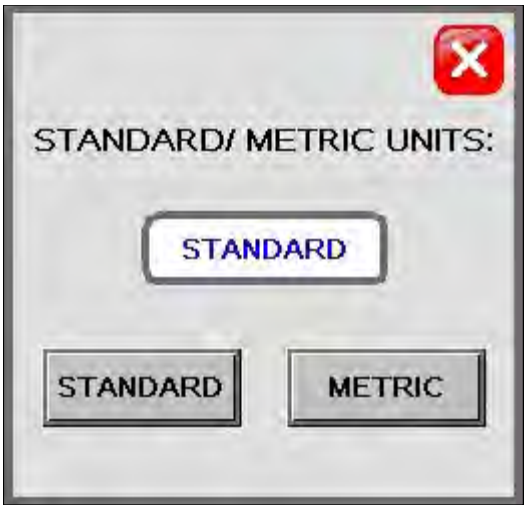


Tools & Options Screen Button Descriptions

7. BIN INFO (continued) : Help button.



8. STANDARD/METRIC UNITS: Allows the operator to switch between Standard or Metric units of measurement. When this button is pressed a window will appear which will allow the operator to the select the desired units of measurement.



Tools & Options Screen Button Descriptions

9. IMPORT/EXPORT LISTS: Pressing this button will advance the operator to the Import/Export screen. From here you can choose from a variety of lists that can be either imported from a USB, exported to a USB to be saved or deleted from the records on the machine.

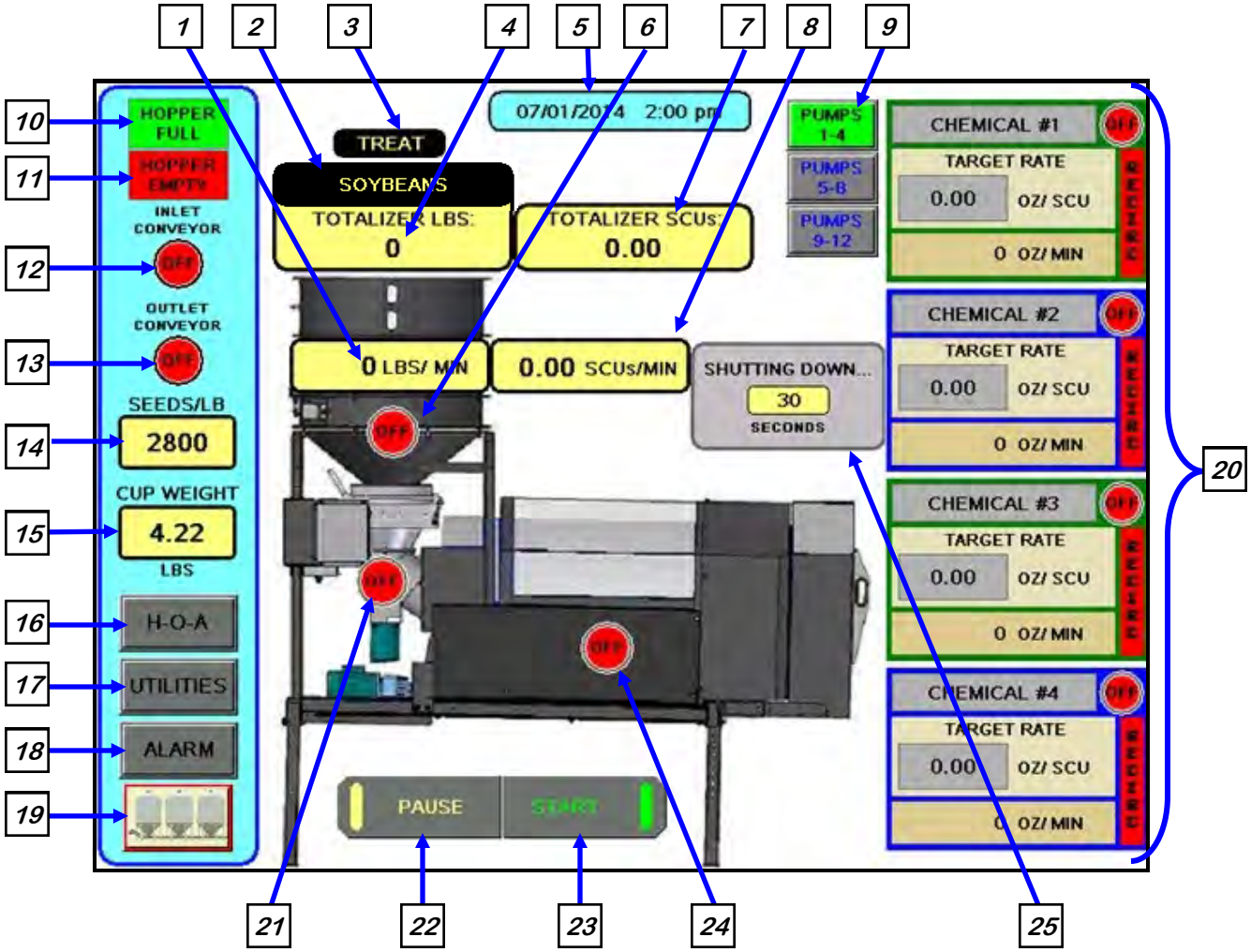
10. USC INSTANT MESSENGER: Pressing this button will advance the operator to the Instant Messenger screen. This allows the operator to communicate with the technical support staff. This option only functions if the operator has U-Connect Lite installed on their laptop or U-Connect Pro is connected to the control panel using a thin client to make the connection. (U-Connect Pro comes standard with U-Treat v3.0.00)

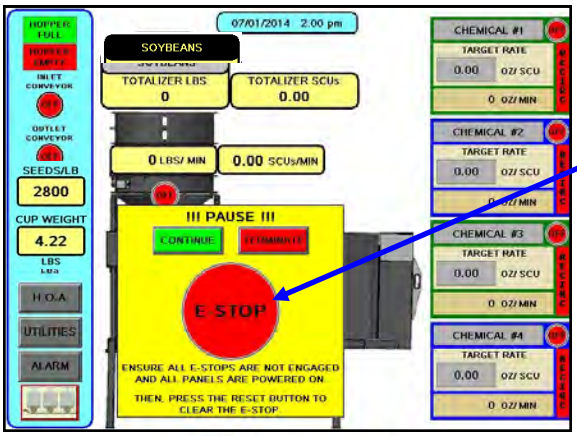
11. USC EMAIL SETUP: Pressing this button will advance the operator to the Email setup screen. This allows the user to email reports using the U-Connect Pro if enabled. The user can also set all reports to email automatically after every run on this screen.

SECTION C-2 LPX TREATER AUTOMATION

MAIN SCREEN

This screen informs the operator of the status of all system motors and electrical devices and allows for control/adjustment of system operations.





Main Screen Button Descriptions

1. SEED FLOW RATE: Displays the seed flow rate in pounds or kilograms per minute.

2. SEED TYPE INDICATOR: Displays seed type selected last.

3. DIVERTER INDICATOR (optional): Informs the operator if the diverter is currently in the treat or bypass position. This indicator will only be present if the LPX Treater has an automated bin site with a diverter.

4. TOTALIZED WEIGHT DISPLAY: Displays the total pounds or kilograms of seed as they pass through the seed wheel.

5. CURRENT DATE AND TIME DISPLAY.

6. SEED WHEEL MOTOR STATUS INDICATOR: Informs the operator if the seed wheel is ON or OFF.

7. TOTALIZED SCU WEIGHT DISPLAY: Displays the total Seed Count Units as it passes through the Seed Wheel. This is only visible if at least one of the pump stands has been set to run in the SCU mode or the SCU option is selected on the UTILITIES screen.

8. SCU SEED FLOW RATE: Displays the seed flow rate in Seed Count Units per minute. This is only visible if at least one of the pump stands has been set to run in the SCU mode or the SCU option is selected on the UTILITIES screen.

9. PUMPS: These buttons appear when more than 4 pumps are enabled. When pressing these you can rotate between each group of 4 pumps.

10. HOPPER FULL: Informs the operator when the proximity switch located in the supply hopper above the seed wheel is detecting seed. When the indicator is active any equipment plugged into the Inlet Conveyor plug will be turned off.

11. HOPPER EMPTY: Informs the operator when the proximity switches located in the seed wheel are not detecting seed.

12. INLET CONVEYOR MOTOR STATUS INDICATOR: Informs the operator if the inlet conveyor is ON or OFF.

13. OUTLET CONVEYOR MOTOR STATUS INDICATOR: Informs the operator if the outlet conveyor is ON or OFF.

14. SEEDS / LB: This shows the seed flow rate when operating in SCU mode and will only appear if at least one of the pump stands has been set to run in the SCU mode or the SCU option is selected on the UTILITIES screen.

15. CUP WEIGHT: This shows the seed cup weight that is used to calculate the seed flow rate the seed wheel will output.

Main Screen Button Descriptions

16. H-O-A (Hand-Off-Auto): This button advances the operator to the H-O-A screen (page 34).

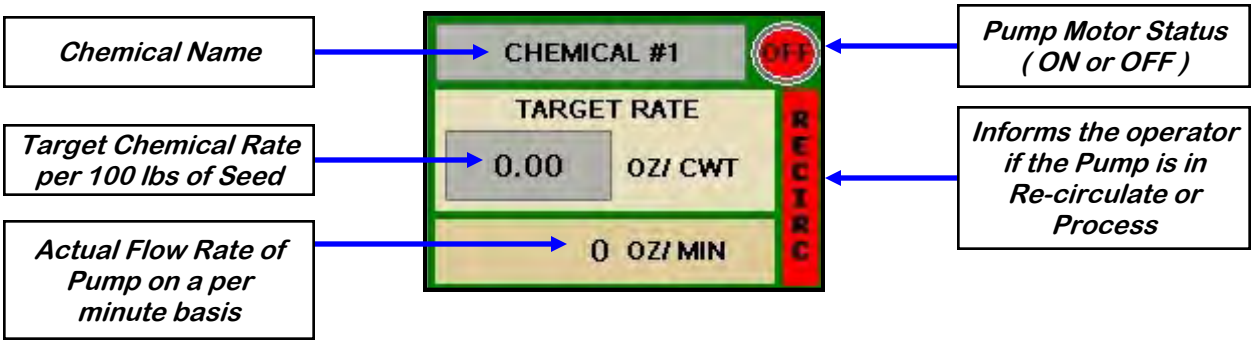
17. UTILITIES: This button advances the operator to the UTILITIES screen (page 38).

18. ALARM: This button advances the operator to the ALARM screen to review, reset and delete alarms. The operator can also mute the alarm horn from this screen.

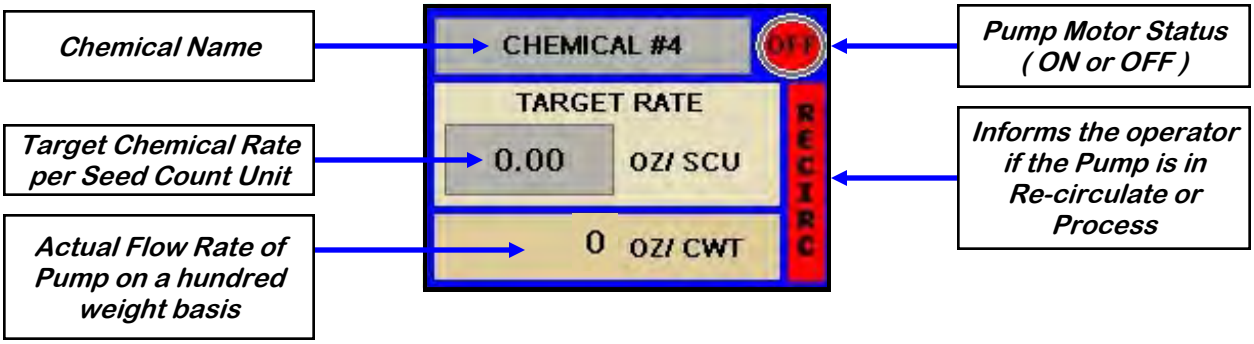
19. BIN SITE BUTTON: When the treater is being used in conjunction with a bin site this button allows the operator to toggle back and forth between the main treater screen and the main bin site screen. If only a Treater is in use, it returns the operator to the start up screen.

20. PUMP STATUS MODULES: This block of information informs the operator of the pump motor status ON or OFF, air actuated 3-way valve status, currently selected chemical, target flow rate and actual flow rate from flow meter.

CUT WEIGHT / OUNCES PER MINUTE



SEED COUNT UNITS / OUNCES PER CUT WEIGHT



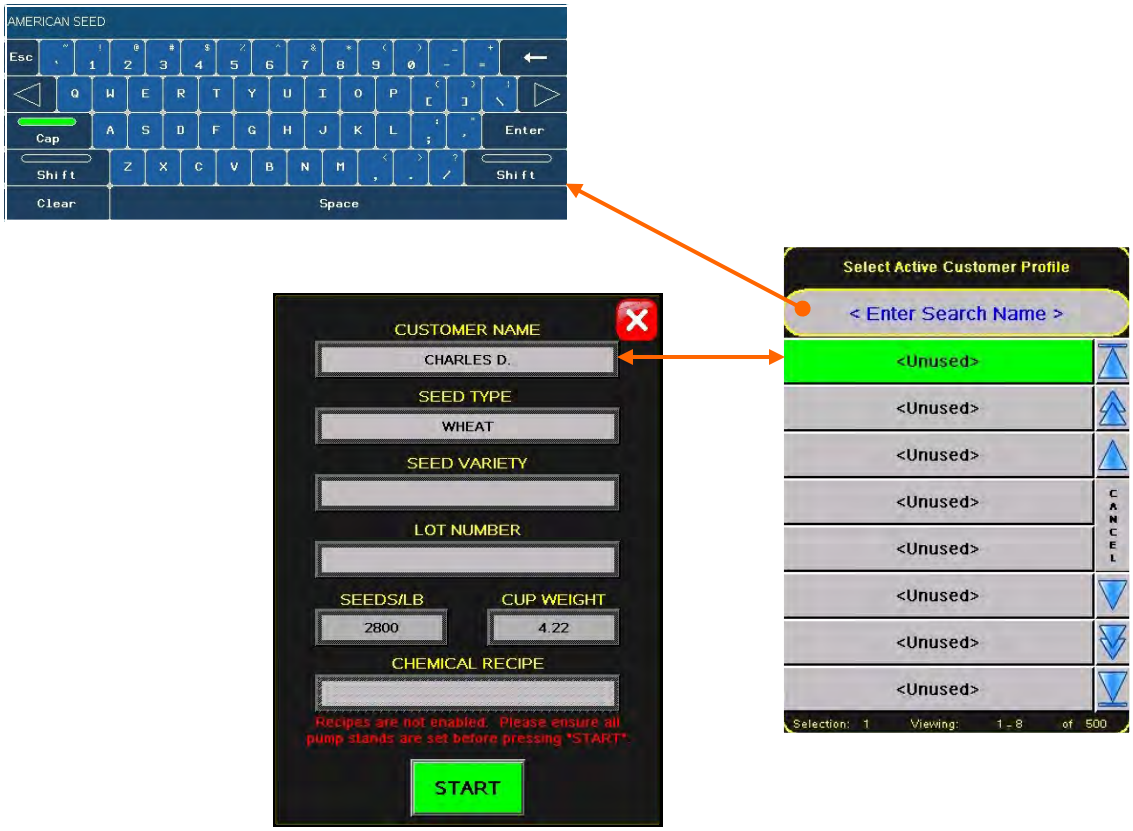
NOTICE Actual flow rate of pump may be defined as either oz/min or oz/cwt regardless of the target rate setting (oz/cwt or oz/scu).

Main Screen Button Descriptions

21. ATOMIZER MOTOR STATUS INDICATOR: Informs the operator if the atomizer motor is ON or OFF.

22. PAUSE BUTTON: Once the START button has been pushed and the system begins to operate, this becomes the PAUSE button.

23. START BUTTON: This is used to start the machine after all motors have been placed into the AUTO position. Once the button is pushed a pop-up window appears. You may select the customer by selecting the customer name box to search the rolodex for an existing entry by typing their name in the search field or using the navigation arrows. When all the information has been added press START to begin the run. Once the system begins to operate it becomes the SHUTDOWN button.



24. DRUM MOTOR STATUS INDICATOR: Informs the operator if the drum drive motor is ON or OFF.

25. SYSTEM SHUTDOWN INDICATOR: Informs the operator that the system is in the process of shutting down. The timer in the middle counts down how many seconds are left before shutdown is complete.

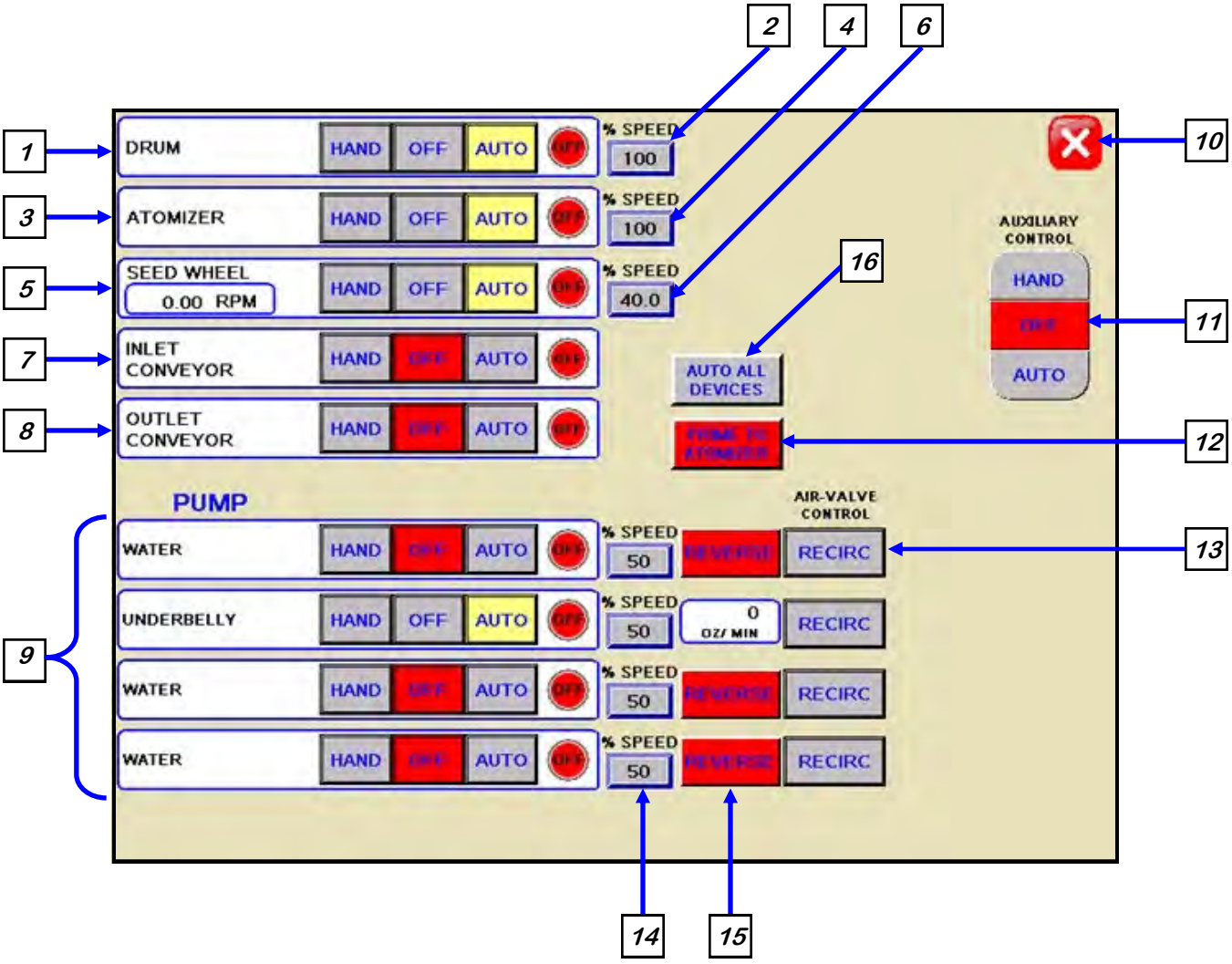
26. EMERGENCY STOP INDICATOR: This blinking display is activated when the system's E-Stop button is activated.

TREATER H-O-A (HAND-OFF-AUTO) SCREEN

Hand-Off-Auto controls are provided for most of the automated devices in the system, and are accessed on this screen.

⚠ WARNING

These H-O-A buttons force the selected component to be energized (HAND), de-energized (OFF), or automatically energized by the normal logic sequence (AUTO). The HAND function will cause the component to operate independent of whatever else the system is trying to do automatically. These functions should not normally be used if the automated sequencing is active. **Be sure to understand the impact of energizing or de-energizing a component with the HAND/OFF settings before using them. These commands are not a substitute for Lockout/Tagout procedures when working on or near this machine. Use proper lockout/tagout procedures to disable the equipment before servicing it.**



H-O-A Button Descriptions

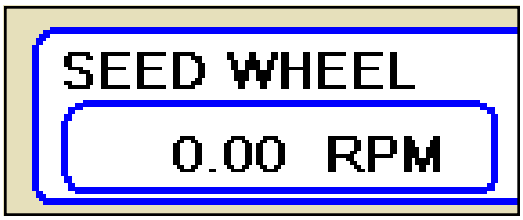
1. DRUM CONTROL MODULE: This module controls the function of the drum. The HAND button will place the drum in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this function unless all other needed devices are in the AUTO mode and the START button is pressed on the main screen.

2. DRUM PERCENT SPEED: When this button is pressed, a numeric touch pad (bottom) will appear to allow the operator to manually adjust the speed of the drum.

3. ATOMIZER CONTROL MODULE: This module controls the function of the atomizer. The HAND button will place the atomizer in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this function unless all other needed devices are in the AUTO mode and either the PRIME TO ATOMIZER or the START button is pressed on the main screen.

4. ATOMIZER PERCENT SPEED: When this button is pressed, a numeric touch pad (bottom) will appear to allow the operator to manually adjust the speed of the atomizer.

5. SEED WHEEL CONTROL MODULE: This module controls the function of the seed wheel. The HAND button will place the seed wheel in the manual mode of operation. This module shows the current RPM of the seed wheel (right). The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this function unless all other needed devices are in the AUTO mode and the START button is pressed on the main screen.



6. SEED WHEEL PERCENT SPEED: When this button is pressed, a numeric touch pad (right) will appear to allow the operator to manually adjust the speed of the seed wheel. When running in the AUTO mode the program will override this setting.

H-O-A Button Descriptions

7. INLET CONVEYOR CONTROL MODULE: This module controls the function of the inlet conveyor. The HAND button will place the inlet conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this function unless all other needed devices are in the AUTO mode and the START button is pressed on the main screen. When the proximity switch located in the supply hopper above the seed wheel is detecting seed and the indicator is active, any equipment plugged into the Inlet Conveyor plug will be turned off.

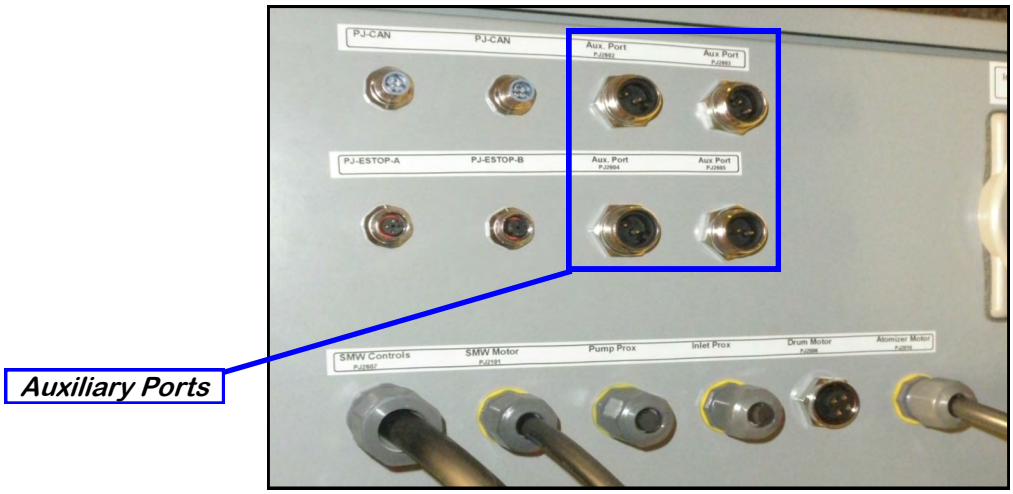
8. OUTLET CONVEYOR CONTROL MODULE: This module controls the function of the outlet conveyor. The HAND button will place the outlet conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this function unless all other needed devices are in the AUTO mode and the START button is pressed on the main screen.

9. PUMP CONTROL MODULES: These modules control the function of the Pump Stands. The HAND button will place the desired pump in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The pump will not operate in this function until the START button is pressed on the main screen. This module also monitors the proximity sensor in the Seed Wheel. When the proximity switch is detecting seed and the indicator is active, the 3 - way valve will switch to PROCESS. When no seed is detected it will switch to RECIRC.

10. SCREEN EXIT BUTTON: This button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

11. AUXILIARY CONTROL: This module allows the operator to control any unit which is plugged into the auxiliary port located on the bottom of the treater control panel. The HAND button will allow the user to operate the unit in the manual mode of operation. The OFF button will disconnect control to the auxiliary port. The AUTO button will place the unit in the automatic mode of operation. Any unit plugged into the auxiliary port will not operate in this function until the START button is pressed on the main screen. It will also turn off using the same logic as the pump stands. See picture (page 37, top).

H-O-A Button Descriptions



12. PRIME TO ATOMIZER BUTTON: Used before a controlled startup to preload chemical in the tubing leading to the atomizer. To operate this button, place the atomizer and any pump that will be used in the AUTO mode. Next press and hold the PRIME TO ATOMIZER button. The atomizer and pumps will turn on and the liquid will be directed to the atomizer. The atomizer and pumps will run as long as the button is being pressed. When the button is released the atomizer and pumps will shut-off.

13. AIR VALVE CONTROL MODULE: This module controls where liquid is diverted for each pump. When a desired pump is placed in the HAND mode, the RECIRC button will appear next to that pump control module. In this mode, liquid is pumped out of its desired tank, through the air actuated 3-way valve manifold and back into the mix tank. When the RECIRC. button is pressed, the icon will change to PROCESS. In this mode, liquid is diverted from the air actuated 3-way valve, to the atomizer. When the OFF button is pressed the pump will go back to RECIRC. When the pump is placed in the AUTO mode the Air Valve Control cannot be accessed. (Optional feature)

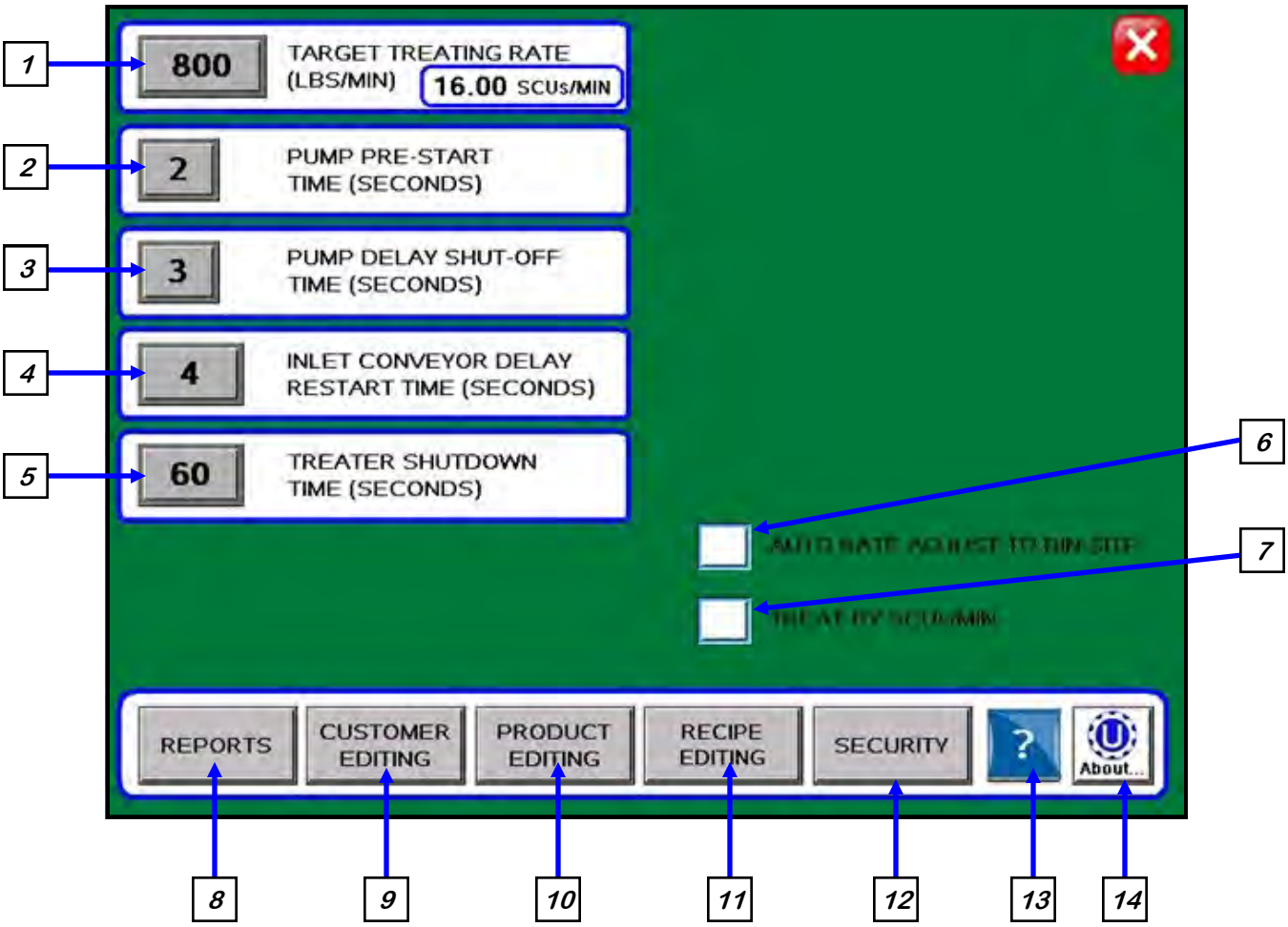
14. PUMP PERCENT SPEED: When this button is pressed, a numeric touch pad will appear to allow the operator to manually adjust the speed of the pump(s). When running in the AUTO mode the program will override this setting.

15. REVERSE BUTTON: Allows the operator to reverse the pump direction and pump the product back into the mix tank. When the pump is in Hand or Auto mode, this button will become a display for the actual pump flow rate. When running in the AUTO mode the program will override this setting.

16. AUTO ALL DEVICES: Pressing this button will put all devices into the auto setting.

TREATER UTILITIES SCREEN

This screen allows the operator to set various system parameters and gives access to the Reports, Product Selection, Security, Alarms, Customer Information and General Information screens.



NOTICE When buttons 1-5 are pressed, a numeric touch pad (right) will appear allowing the operator to enter in a number for that particular parameter.

Utilities Screen Button Descriptions

1. TARGET TREATING RATE: Pressing this button allows the operator to adjust the estimated treating rate in pounds per minute. This number is used by the system to control the rate of the seed wheel and pumps.

2. PUMP PRE-START TIME: Pressing this button allows the operator to adjust the start time of the pumps based on the proximity sensor in the seed wheel detecting seed and the timing of the seed wheel turning on. This number will allow the air actuated 3-way valve to actuate and begin sending liquid to the seed treater a pre-defined number of seconds before the seed wheel will turn on. This will help prevent any untreated seed at the beginning of a run.

3. PUMP DELAY SHUT-OFF TIME: Pressing this button allows the operator to adjust the delay shut-off time of the pumps after the proximity switches located in the seed wheel do not detect anymore seed.

4. INLET CONVEYOR DELAY RESTART TIME: Pressing this button allows the operator to adjust the restart time of the inlet conveyor after the proximity switch located at the top of the inlet hopper above the seed wheel no longer detects seed.

5. TREATER SHUTDOWN TIME: Pressing this button allows the operator to adjust the delay shutdown time of the seed treater after the SHUTDOWN button has been pressed after a run. This time will allow the seed treater and any conveyors to completely clean out.

6. AUTO RATE ADJUST TO BIN SITE: (Only present when treater is used with a Tri - Flo ® and USC Bin Site Automation). When this box is checked, Target Treating Rate will automatically be adjusted to 2% slower than the bin site.

7. TREAT BY SCU / MIN: When this box is checked, the primary Target Treating Rate will be calculated in Seed Count Units per minute. Unchecked, it will be calculated in pounds per minute.

8. REPORTS: This button advances the operator to the Reports screen (page 62).

9. CUSTOMER EDITING: This button advances the operator to the Customer Editing screen (page 25).

10. PRODUCT EDITING: This button advances the operator to the Product Editing screen (page 24).

11. RECIPE EDITING: This button advances the operator to the Recipe Editing screen (page 23).

12. SECURITY: This button advances the operator to the Security screen (page 20).

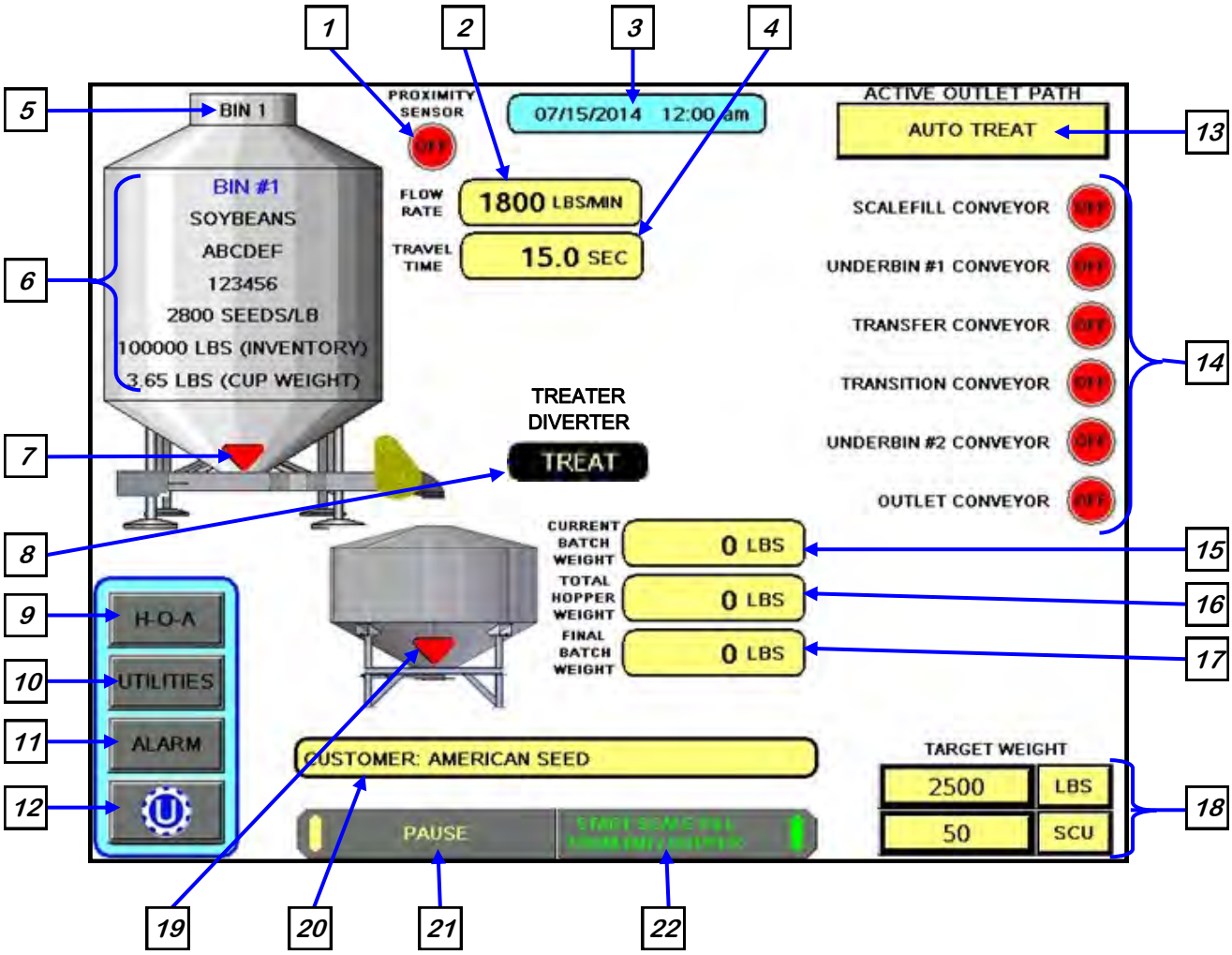
13. INFORMATION: This button advances the operator to the information screen where the operator can find vital information on storage and troubleshooting.

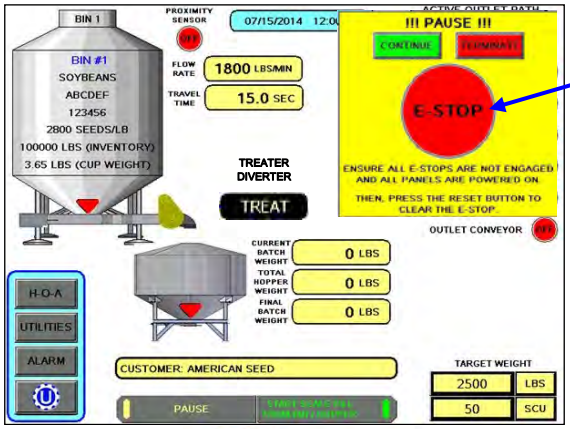
14. ABOUT USC: Pressing this button brings up a popup screen showing the operator what software release is installed.

SECTION C-3 BATCH HOPPER AUTOMATION

MAIN SCREEN

This screen informs the operator of the status of all system motors and electrical devices and allows for control / adjustment of system operations.





Main Screen Button Descriptions

1. INLET HOPPER PROXIMITY SWITCH INDICATOR (optional): Informs the operator of the status of the proximity switch if one is located in the supply hopper on the treater. If the switch is ON (green) it is detecting seed. If it is OFF (red) it is not detecting seed. This is only used with non-PLC based treaters.

2. FLOW RATE DISPLAY: Informs the operator of the flow rate of seed from the currently selected bin.

3. CURRENT DATE and TIME DISPLAY.

4. TRAVEL TIME DISPLAY: Informs the operator of the amount of time seed takes to flow from the currently selected bin to the batch hopper.

5. CURRENT BIN SELECTED: Indicates the currently selected bin.

6. CURRENT BIN INFO: Displays the bin information that has been entered into the currently selected bin. Includes seed type, seed variety, lot number, seeds/lb, amount in inventory and cup weight.

7. BIN SLIDE GATE INDICATOR: Informs the operator of the slide gate position. If it is green the gate is OPEN. If it is red the gate is CLOSED.

8. DIVERTER INDICATOR (optional): Informs the operator if the diverter is currently in the treat or bypass position. This indicator will only be present if the batch hopper system has a diverter.

9. H-O-A (Hand-Off-Auto) BUTTON: This button advances the operator to the H-O-A screen (page 44).

10. UTILITIES BUTTON: This button advances the operator to the UTILITIES screen (page 48).

11. ALARM BUTTON: This button advances the operator to the ALARMS screen (page 103).

12. TREATER BUTTON (optional): This button advances the operator to the treater main screen. This button is only available if the batch hopper system is being operated in conjunction with a PLC controlled seed treater.

13. ACTIVE OUTLET PATH INDICATOR: This display shows the active path for the seed to follow. This can include treating the seed in auto or manual mode as well as bypassing the treater with a diverter and any necessary conveyors. The outlet paths are customizable and set based on the site configurations. Active mode will run both the bin site and treater in sequence with all corresponding conveyors. Manual mode will run just the bin site and the operator will need to go to the treater screen to start the treating process.

Main Screen Button Descriptions

14. CURRENT CONVEYOR MOTOR STATUS INDICATOR: Informs the operator if a particular conveyor motor is on or off.

15.CURRENT BATCH WEIGHT DISPLAY: Informs the operator of the current running total of seed that has entered the batch hopper system for this particular run of seed.

16. TOTAL HOPPER WEIGHT DISPLAY: Informs the operator of the current running total of seed that has entered the batch hopper at any given time.

17. FINAL BATCH WEIGHT DISPLAY: Informs the operator of the weight of seed that has been recorded by the scale printer and reporting system.

18. TARGET WEIGHT DISPLAY: This shows the operator the set target weight and target seed count units requested. This can be changed for a new run on the startup wizard where it allows the operator to enter the amount of seed that is to be pulled in from the selected bin. The operator can also select to call in seed via seed count units (SCU). If SCU is selected, the system will base the units upon the seed count defined for each product on the Edit Product Names screen. That number will vary depending on the type of seed.

19. BATCH WEIGH HOPPER SLIDE GATE INDICATOR: Informs the operator of the status of the air-actuated slide gate located at the bottom of the batch hopper. Green indicating the open position and red for the closed position

20. CUSTOMER DISPLAY: This displays the current customer for the run. If a new customer is needed for a new run you will select it after hitting the start button.

21. PAUSE BUTTON: Allows the operator to pause the ongoing process in the event of a set-up error or an alarm situation. Pushing this button will activate the pause screen (top). Once the issue is resolved push continue to re-start the process. Or use the terminate button.

22. START SCALE FILL FROM BIN/HOPPER BUTTON: Pressing this button opens the startup wizard where the operator will select the desired customer, bin, target weight or SCU, outlet path and chemical recipe if enabled (example on right does not have recipes enabled). By pressing the gray boxes of the items you wish to change a selection list will appear that you can navigate to find the desired selection.

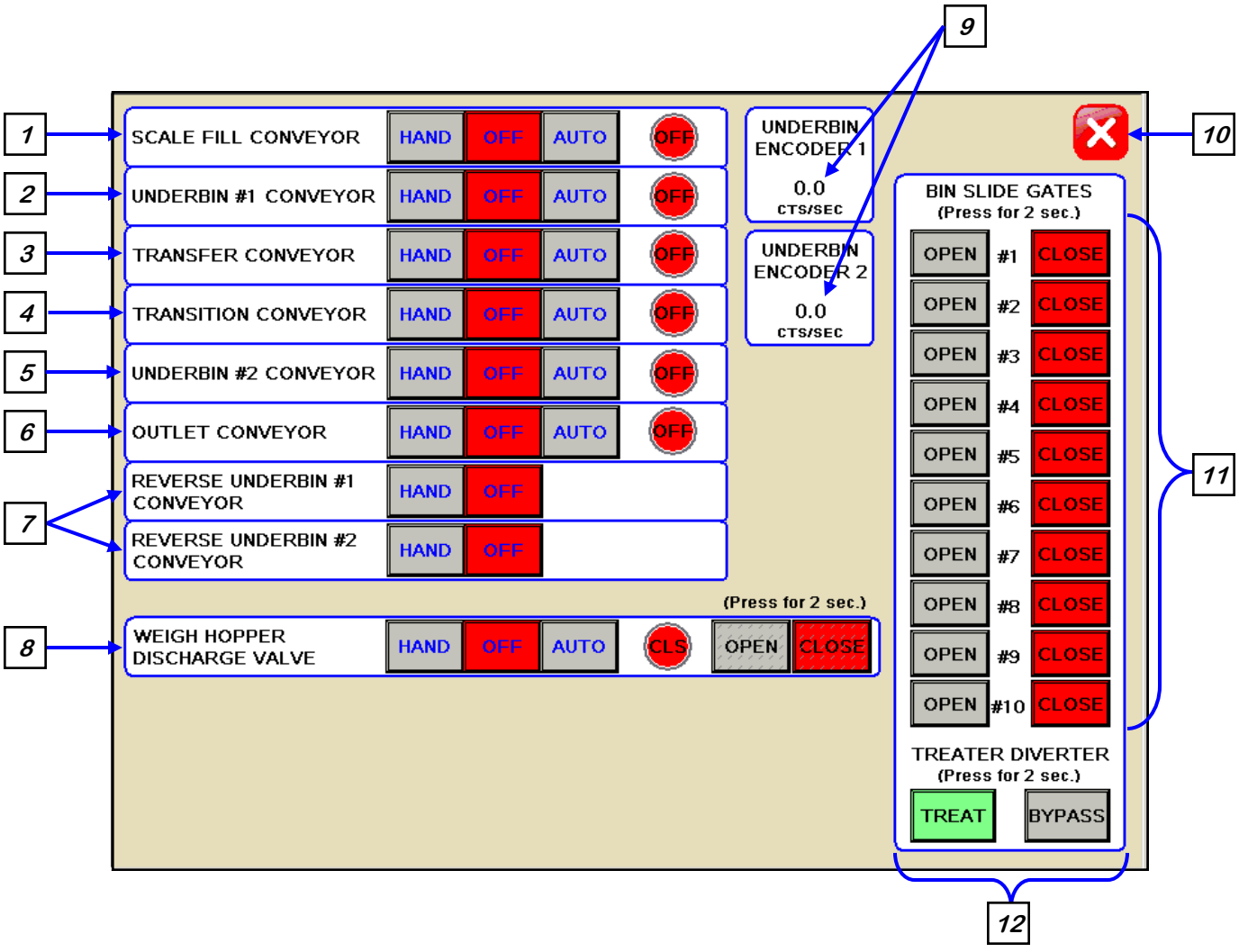
23. EMERGENCY STOP INDICATOR: This blinking display is activated when the system's E-Stop button is activated.

BATCH HOPPER "H-O-A" (HAND-OFF-AUTO) SCREEN

Hand-Off-Auto controls are provided for most of the automated devices in the system, and are accessed on this screen.

WARNING

These H-O-A buttons force the selected component to be energized HAND, de-energized OFF or automatically energized by the normal logic sequence AUTO. The HAND function will cause the component to operate independent of whatever else the system is trying to do automatically. These functions should not normally be used if the automated sequencing is active. **Be sure to understand the impact of energizing or de-energizing a component with the HAND/OFF settings before using them. These commands are not a substitute for lockout/tagout procedures when working on or near this machine. Use proper lockout/tagout procedures to disable the equipment before servicing it.**



H-O-A Button Descriptions

1. SCALE FILL CONVEYOR CONTROL MODULE: This module controls the function of the scale fill conveyor. The HAND button will place the scale fill conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

2. UNDERBIN #1 CONVEYOR CONTROL MODULE: This module controls the function of the underbin #1 conveyor. The HAND button will place the underbin #1 conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

3. TRANSFER CONVEYOR CONTROL MODULE (optional): This module controls the function of the transfer conveyor. The HAND button will place the transfer conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the batch hopper system has a transfer conveyor.

4. TRANSITION CONVEYOR CONTROL MODULE (optional): This module controls the function of the transition conveyor. The HAND button will place the transition conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the batch hopper system has a transition conveyor.

H-O-A Button Descriptions

5 . UNDERBIN #2 CONVEYOR" CONTROL MODULE (optional): This module controls the function of the underbin #2 conveyor. The HAND button will place the underbin #2 conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the batch hopper system has a second underbin conveyor.

6. OUTLET CONVEYOR CONTROL MODULE: This module controls the function of the outlet conveyor. The HAND button will place the outlet conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

7. REVERSE UNDERBIN CONVEYOR CONTROL MODULE (optional): This module operates in the manual mode only. Pressing the HAND button allows the operator to run the underbin conveyor in reverse. **ALWAYS ENSURE THE BELT IS IMMEDIATELY AND PROPERLY ALIGNED WHEN RUNNING IN REVERSE! BELTS WILL OFTEN SHIFT ALIGNMENT WHEN THEIR DIRECTION OF TRAVEL IS REVERSED. BE SURE TO RE-CHECK THE ALIGNMENT AFTER IT IS RETURNED TO THE FORWARD DIRECTION.** This module will only be present if the bin site system has the reversing option for the underbin conveyor.

8. WEIGH HOPPER DISCHARGE VALVE CONTROL MODULE: This module controls the function of the hopper discharge valve located at the bottom of the batch hopper. The HAND button will place the discharge valve in the manual mode of operation. By pressing and holding for two seconds the OPEN or CLOSED button the operator can manually open or close the hopper discharge gate. The round indicator displays the valve status. CLS in red for closed and OPN in green for open. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation and would then be controlled by the batch hopper PLC program.

H-O-A Button Descriptions

9. COUNTS PER SECOND DISPLAY (optional): This display shows the current counts per second that the underbin encoder is reading. This allows the bin site system to be sure that the underbin conveyor is running properly and that the belt is not slipping. This display will only be present if the bin site system has an underbin encoder on the underbin conveyor. If not working correctly, calibration of the seed flow will be effected.

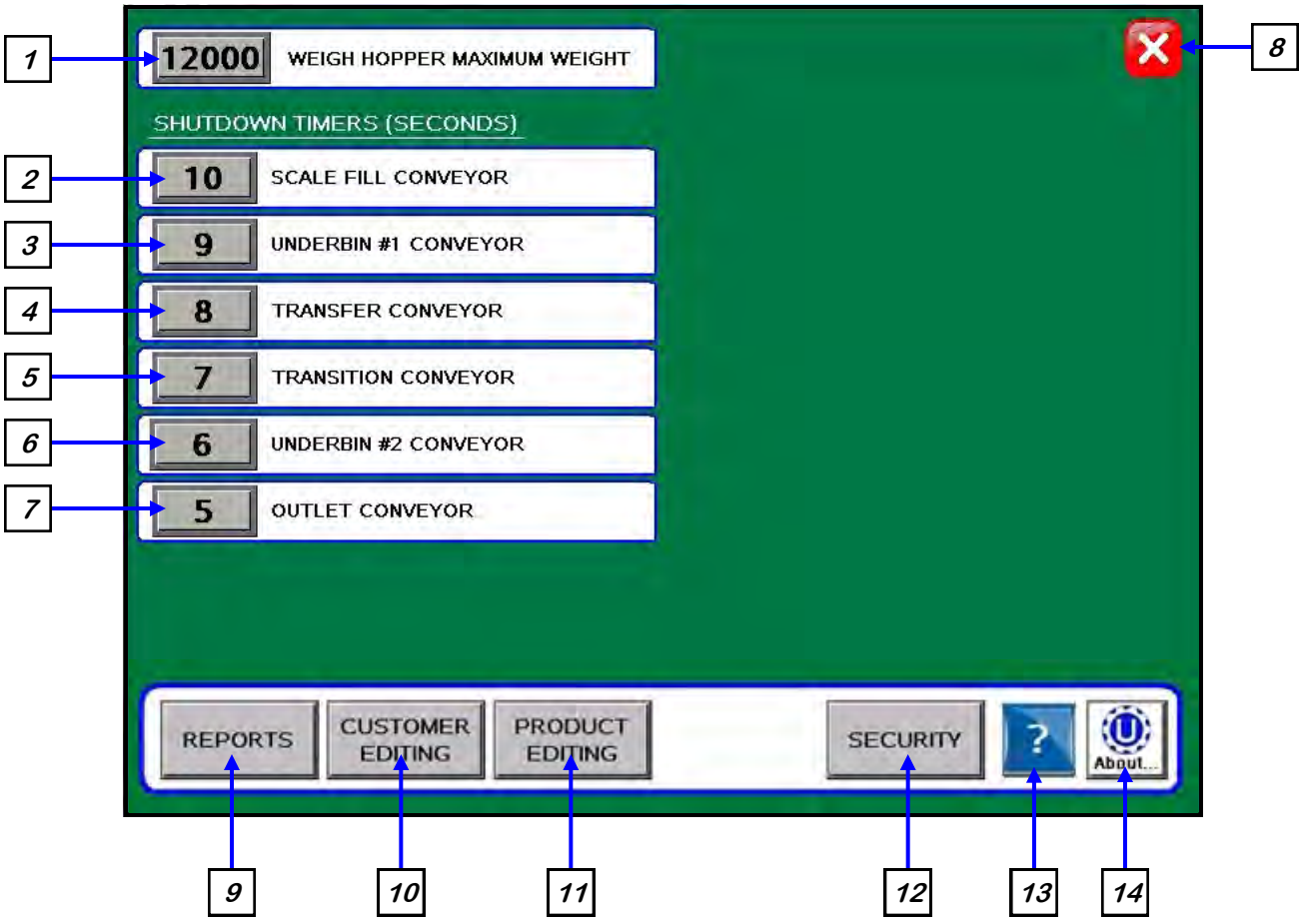
10. SCREEN EXIT BUTTON: This button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

11. BIN SLIDE GATES CONTROL MODULE: This module allows the operator to manually control the operation of the slide gates that are located underneath each bin. The bin slide gates will be opened and closed automatically when the operator presses the START SCALE FILL button on the Main screen.

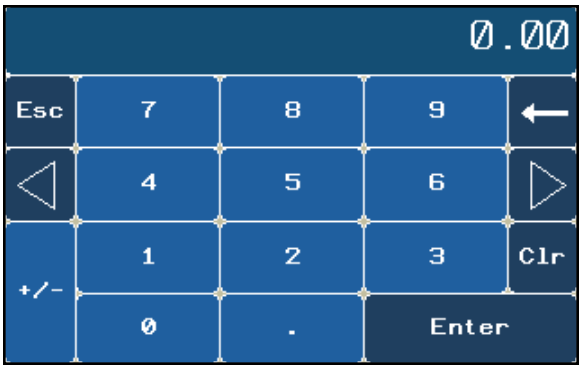
12. DIVERTER CONTROL MODULE (optional): This module controls the function of the diverter. The module allows the operator to choose if the diverter is in the treat or bypass mode. In treat mode seed will be run through the treater and in bypass mode seed will be diverted so that it does not pass through the treater. This module will only be present if the batch hopper system has a diverter.

BATCH HOPPER UTILITIES SCREEN

This screen allows the operator to set various system parameters and gives access to the Bin Site Reports, Alarms, Security and Customer Info screens.



NOTICE When buttons 1-7 are pressed, a numeric touch pad (right) will appear allowing the operator to enter in a number for that particular parameter.



Utilities Screen Button Descriptions

1. MAXIMUM SCALE WEIGHT: Pressing this button allows the operator to adjust the maximum amount of seed that the scale can hold.

2. SCALE FILL CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the scale fill conveyor.

3. UNDERBIN #1 CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the underbin #1 conveyor. This timer will begin once the bin slide gate has closed and will allow the underbin conveyor to clean itself out.

4. TRANSFER CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the transfer conveyor. This timer will allow the Pro Box hopper to clean itself out. This button will only be present if the Pro Box hopper is being used.

5. TRANSITION CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the transition conveyor. This timer will allow the transition conveyor to clean itself out.

6. UNDERBIN #2 CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the underbin #2 conveyor. This timer will begin once the batch is finished and will allow the underbin conveyor to clean itself out. This button will only be present if the batch hopper system has a second underbin conveyor.

7. OUTLET CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the outlet conveyor. This timer will always be set to the longest shutdown time to be sure all other conveyors and the treater have cleared themselves of seed and shutdown.

8. SCREEN EXIT BUTTON: Pressing this button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

9. REPORTS BUTTON: Pressing this button advances the operator to the Reports screen.

10. CUSTOMER EDITING BUTTON: Pressing this button advances the operator to the Customer Editing screen. (page 25)

11. PRODUCT EDITING BUTTON: Pressing this button advances the operator to the Product Editing Screen. (page 24)

12. SECURITY BUTTON: Pressing this button advances the operator to the Security screen. (page 20)

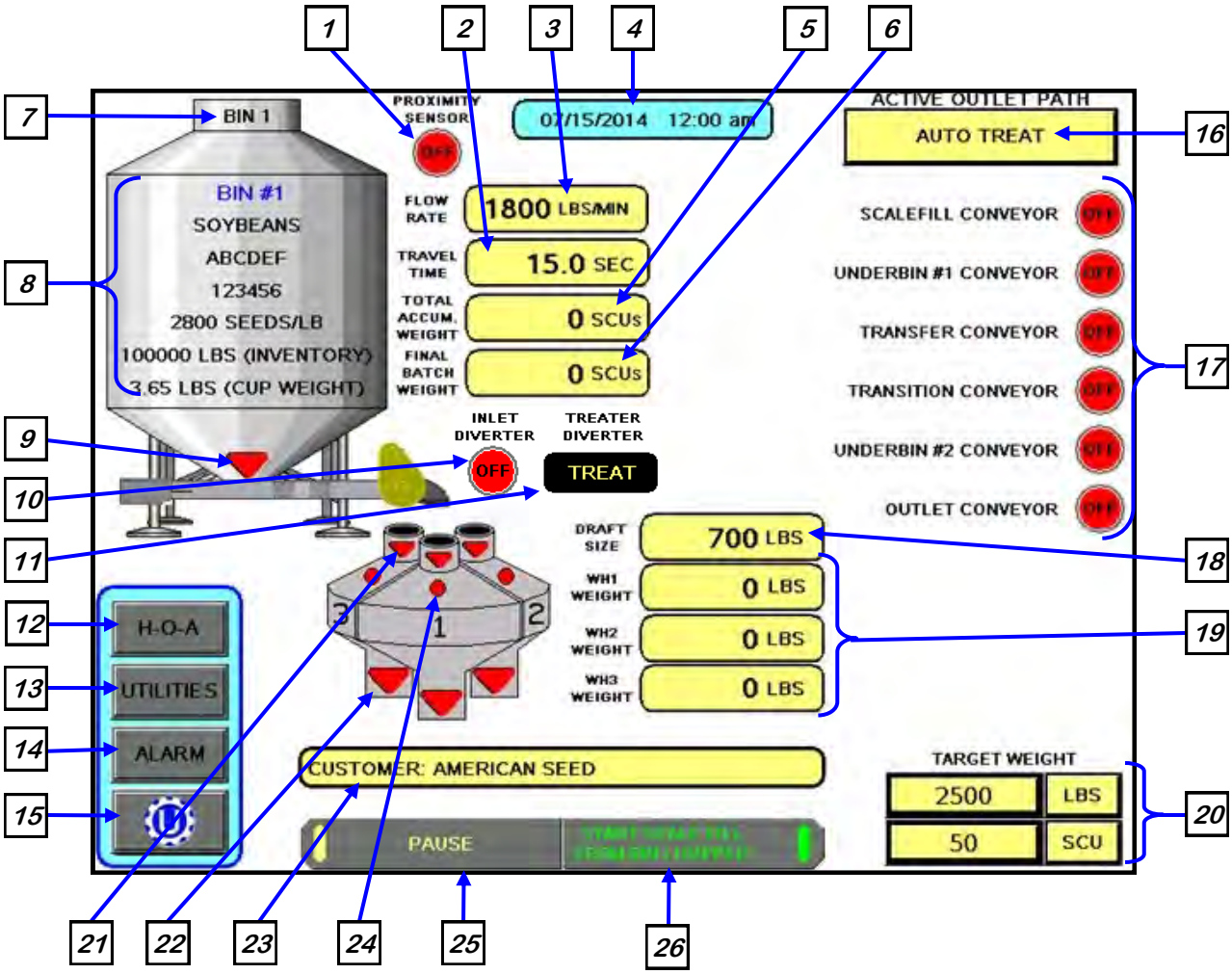
13. HELP: Pressing this button takes the operator to the Help Screen where you can find common solutions for problems you may encounter.

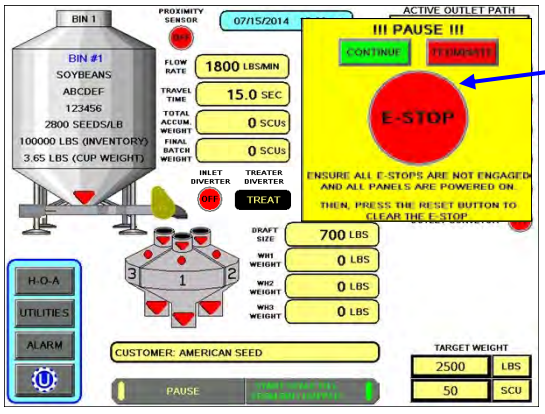
14. ABOUT USC BUTTON: Pressing this button allows the operator see what software release is installed in the system.

SECTION C-4 TRI - FLO ® AUTOMATION

MAIN SCREEN

This screen informs the operator of the status of all system motors and electrical devices and allows for control / adjustment of system operations.





Main Screen Button Descriptions

1. INLET HOPPER PROXIMITY SWITCH INDICATOR (optional): Informs the operator of the status of the proximity switch if one is located in the supply hopper on the treater. If the switch is ON (green) it is detecting seed. If it is OFF (red) it is not detecting seed. This is only used with a non-PLC based treaters.

2. TRAVEL TIME DISPLAY: Informs the operator of the amount of time seed takes to flow from the currently selected bin to the Tri - Flo ® .

3. FLOW RATE DISPLAY: Informs the operator of the flow rate of seed from the currently selected bin.

4. CURRENT DATE and TIME DISPLAY.

5. TOTAL ACCUM. WEIGHT DISPLAY: Informs the operator of the current running total of seed that has entered the Tri - Flo ® system for this particular run of seed.

6. FINAL BATCH WEIGHT DISPLAY: Informs the operator of the weight of seed that has been recorded by the scale printer and has exited the Tri - Flo ® system during a given run of seed.

7. CURRENT BIN SELECTED: Indicates the currently selected bin.

8. CURRENT BIN INFO: Displays the bin information that has been entered into the currently selected bin. Includes seed type, seed variety, lot number, seeds/lb, amount in inventory and cup weight.

9. BIN SLIDE GATE INDICATOR: Informs the operator of the slide gate position. If it is green the gate is OPEN. If it is red the gate is CLOSED.

10. TRI - FLO® INLET DIVERTER MOTOR STATUS INDICATOR: Informs the operator if the inlet diverter motor is on or off.

4.

11. DIVERTER INDICATOR (optional): Informs the operator if the diverter is currently in the treat or bypass position. This indicator will only be present if the Tri - Flo ® System has a diverter.

12. H-O-A (Hand-Off-Auto) BUTTON: This button advances the operator to the H-O-A screen (page 55).

13. UTILITIES BUTTON: This button advances the operator to the UTILITIES screen (page 59).

14. ALARM BUTTON: This button advances the operator to the ALARMS screen (page 109).

15. TREATER BUTTON (optional): This button advances the operator to the treater main screen. This button is only available if the Tri - Flo ® system is being operated in conjunction with a PLC controlled seed treater.

Main Screen Button Descriptions

16. ACTIVE OUTLET PATH DISPLAY: This display shows the active path for the seed to follow. This can include treating the seed in auto or manual mode as well as bypassing the treater with a diverter and any necessary conveyors. The outlet paths are customizable and set based on the site configurations. Active mode will run both the bin site and treater in sequence with all corresponding conveyors. Manual mode will run just the bin site and the operator will need to go to the treater screen to start the treating process.

17. CURRENT CONVEYOR MOTOR STATUS INDICATOR: Informs the operator if a particular conveyor motor is on or off.

18. DRAFT SIZE DISPLAY: Is the seed weight that is to be loaded into each hopper before the system rotates and begins to fill the next hopper.

19. WEIGH HOPPER DISPLAY: Gives the operator a real time running weight total for each of the three individual hoppers.

20. TARGET WEIGHT DISPLAY: This shows the operator the set target weight and target seed count units requested. This can be changed for a new run on the startup wizard where it allows the operator to enter the amount of seed that is to be pulled in from the selected bin. The operator can also select to call in seed via seed count units (SCU). If SCU is selected, the system will base the units upon the seed count defined for each product on the Edit Product Names screen. That number will vary depending on the type of seed.

21. TRI - FLO® INLET DIVERTER DISPLAY: Informs the operator which one of the three weigh hoppers the diverter is in position to load seed into. The active hopper will be green.

22. TRI - FLO® WEIGH HOPPER SLIDE GATE INDICATORS: Informs the operator of the status of the air-actuated slide gate located at the bottom of each hopper. Green indicating the open position and red for the closed position.

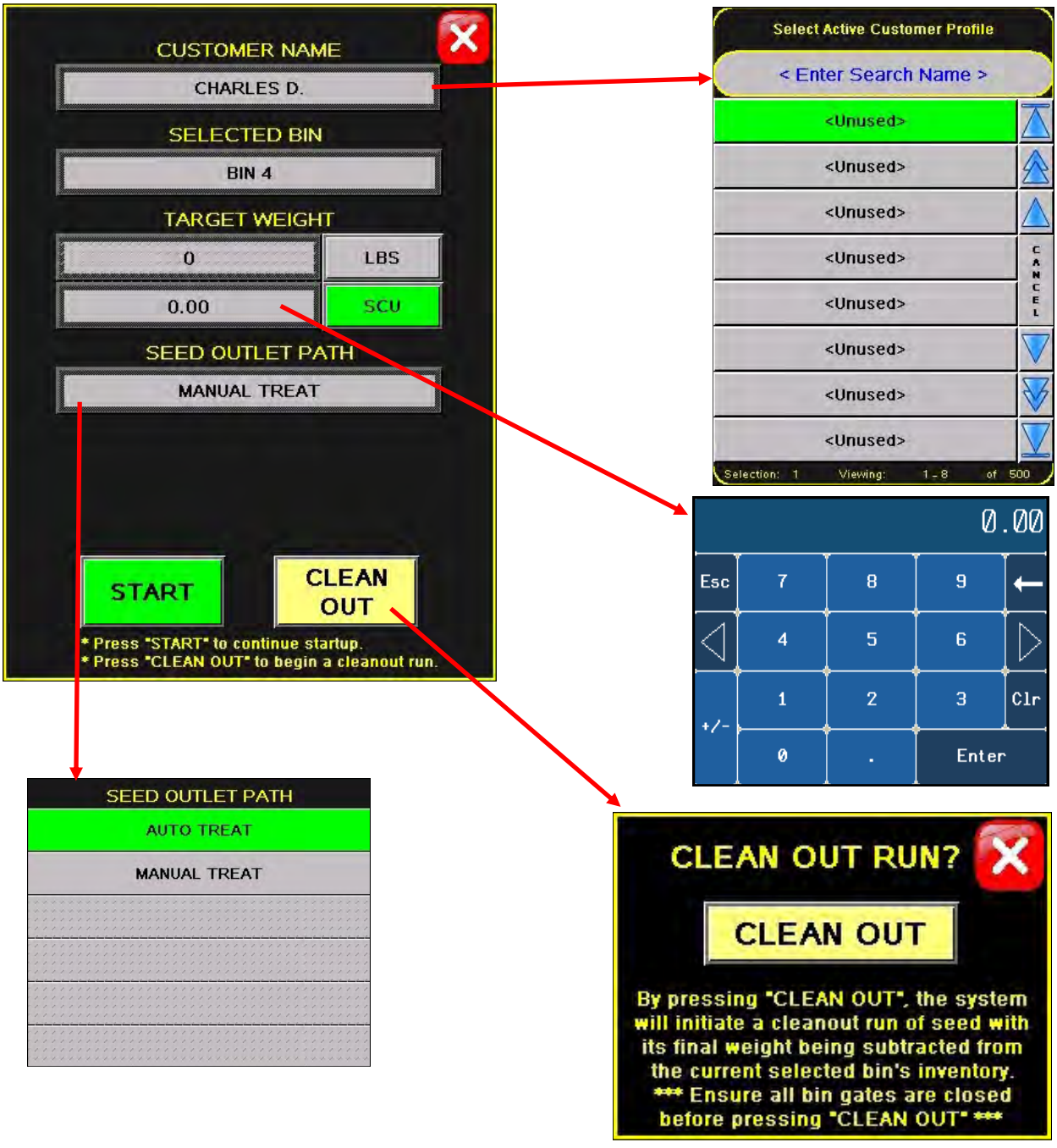
23. CUSTOMER DISPLAY: This displays the current customer for the run. If a new customer is needed for a new run you will select it after hitting the start button.

24. SEED PROXIMITY INDICATOR DISPLAY: Informs the operator when any one of the three hoppers is over full. Green indicates full.

25. PAUSE BUTTON: Allows the operator to pause the ongoing process in the event of a set-up error or an alarm situation. Pushing this button will activate the pause screen (right). Once the issue is resolved push CONTINUE to re-start the process. Or use the TERMINATE button.

Main Screen Button Descriptions

26. START SCALE FILL FROM BIN/HOPPER BUTTON: Opens the startup wizard where the operator can choose to run from a manual hopper or from a bin. Here they will also choose the customer, target weight or SCUs desired and the outlet path. If for any reason after a run there is seed left in any of the weigh hoppers or conveyors you may run Clean Out. The Clean Out functions the same as a regular run except with the bin slide gate closed. After all seed has been weighed and cleared from the system a separate report is generated accounting for the weight of that seed.



Main Screen Button Descriptions

26. (continued): If the operator is running from Manual Hopper a verification screen (right) appears to allow them to modify any of the Pro Box information for that particular run. The Treater Flow Rate is displayed on the right side of this screen. The operator may select the button and change the Treater Flow Rate without having to return to the Main Treater screen.

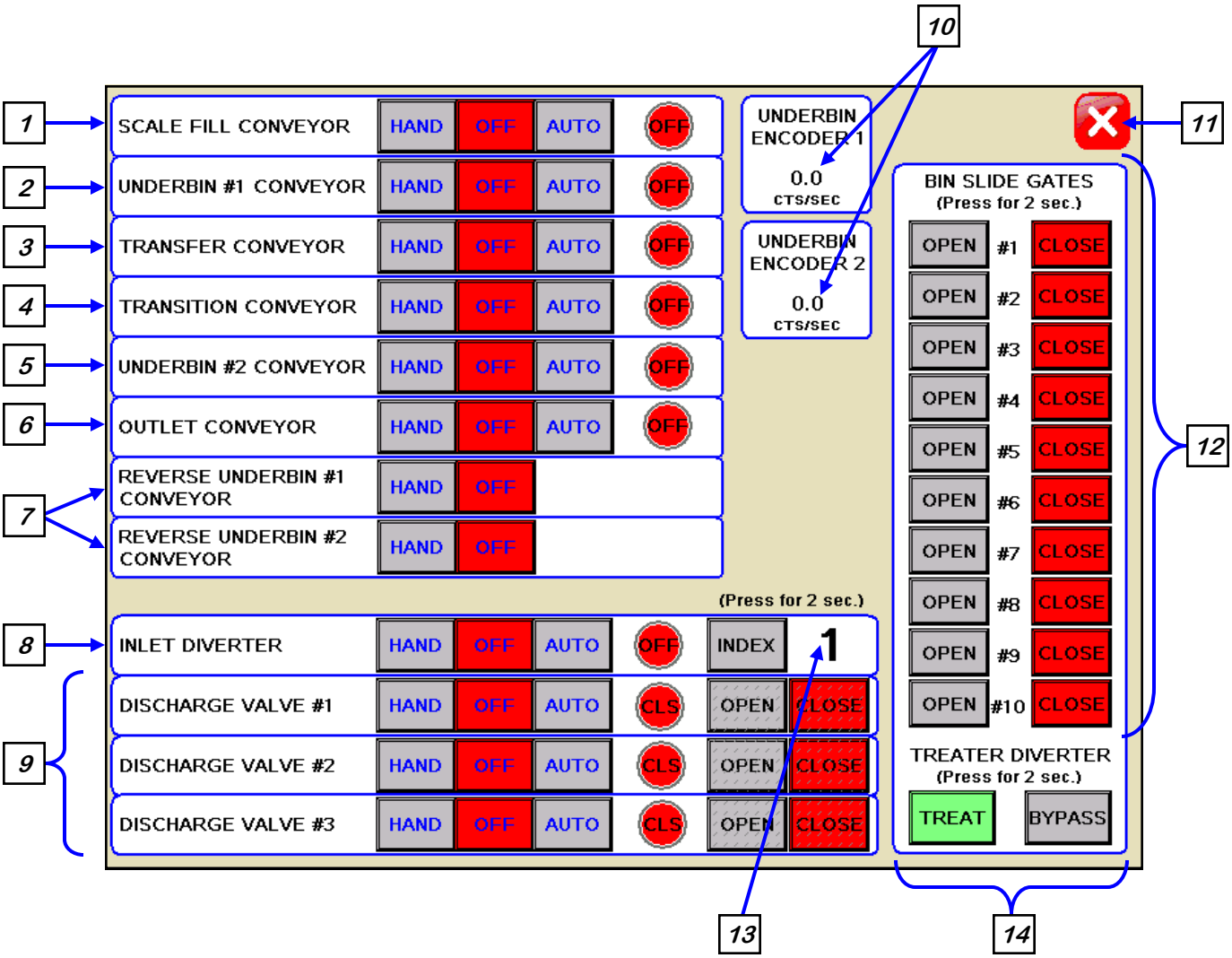
27. EMERGENCY STOP INDICATOR: This blinking display is activated when the system's E-Stop button is activated.

TRI - FLO ® "H-O-A" (HAND-OFF-AUTO) SCREEN

Hand-Off-Auto controls are provided for most of the automated devices in the system, and are accessed on this screen.

WARNING

These H-O-A buttons force the selected component to be energized HAND, de-energized OFF or automatically energized by the normal logic sequence AUTO. The HAND function will cause the component to operate independent of whatever else the system is trying to do automatically. These functions should not normally be used if the automated sequencing is active. **Be sure to understand the impact of energizing or de-energizing a component with the HAND/OFF settings before using them. These commands are not a substitute for lockout/tagout procedures when working on or near this machine. Use proper lockout/tagout procedures to disable the equipment before servicing it.**



H-O-A Button Descriptions

1. SCALE FILL CONVEYOR CONTROL MODULE: This module controls the function of the scale fill conveyor. The HAND button will place the scale fill conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

2. UNDERBIN #1 CONVEYOR CONTROL MODULE: This module controls the function of the underbin #1 conveyor. The HAND button will place the underbin #1 conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

3. TRANSFER CONVEYOR CONTROL MODULE (optional): This module controls the function of the transfer conveyor. The HAND button will place the transfer conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the Tri - Flo ® System has a transfer conveyor.

4. TRANSITION CONVEYOR CONTROL MODULE (optional): This module controls the function of the transition conveyor. The HAND button will place the transition conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the Tri - Flo ® system has a transition conveyor.

H-O-A Button Descriptions

5 . UNDERBIN #2 CONVEYOR" CONTROL MODULE (optional): This module controls the function of the underbin #2 conveyor. The HAND button will place the underbin #2 conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen. This button will only be present if the Tri - Flo ® system has a second underbin conveyor.

6. OUTLET CONVEYOR CONTROL MODULE: This module controls the function of the outlet conveyor. The HAND button will place the outlet conveyor in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation. The motor will not operate in this mode unless all other needed devices are in the AUTO mode and the START SCALE FILL button is pressed on the Main screen.

7. REVERSE UNDERBIN CONVEYOR CONTROL MODULE (optional): This module operates in the manual mode only. Pressing the HAND button allows the operator to run the underbin conveyor in reverse. **ALWAYS ENSURE THE BELT IS IMMEDIATELY AND PROPERLY ALIGNED WHEN RUNNING IN REVERSE! BELTS WILL OFTEN SHIFT ALIGNMENT WHEN THEIR DIRECTION OF TRAVEL IS REVERSED. BE SURE TO RE-CHECK THE ALIGNMENT AFTER IT IS RETURNED TO THE FORWARD DIRECTION.** This module will only be present if the bin site system has the reversing option for the underbin conveyor.

8. TRI - FLO® INLET DIVERTER CONTROL MODULE : This module controls the function of the inlet diverter. The HAND button will place the inlet diverter in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation and would then be controlled by the Tri - Flo ® PLC program.

9. TRI - FLO® WEIGH HOPPER DISCHARGE VALVE CONTROL MODULE:
This module controls the function of the hopper discharge valve located at the bottom of each of the three individual hoppers. The HAND button will place the discharge valve in the manual mode of operation. The OFF button will turn the associated device in the OFF mode of operation. The AUTO button will place the device in the automatic mode of operation and would then be controlled by the Tri - Flo ® PLC program.

H-O-A Button Descriptions

10. COUNTS PER SECOND DISPLAY (optional): This display shows the current counts per second that the underbin encoder is reading. This allows the bin site system to be sure that the underbin conveyor is running properly and that the belt is not slipping. This display will only be present if the bin site system has an underbin encoder on the underbin conveyor. If not working correctly, calibration of the seed flow will be effected.

11. SCREEN EXIT BUTTON: This button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

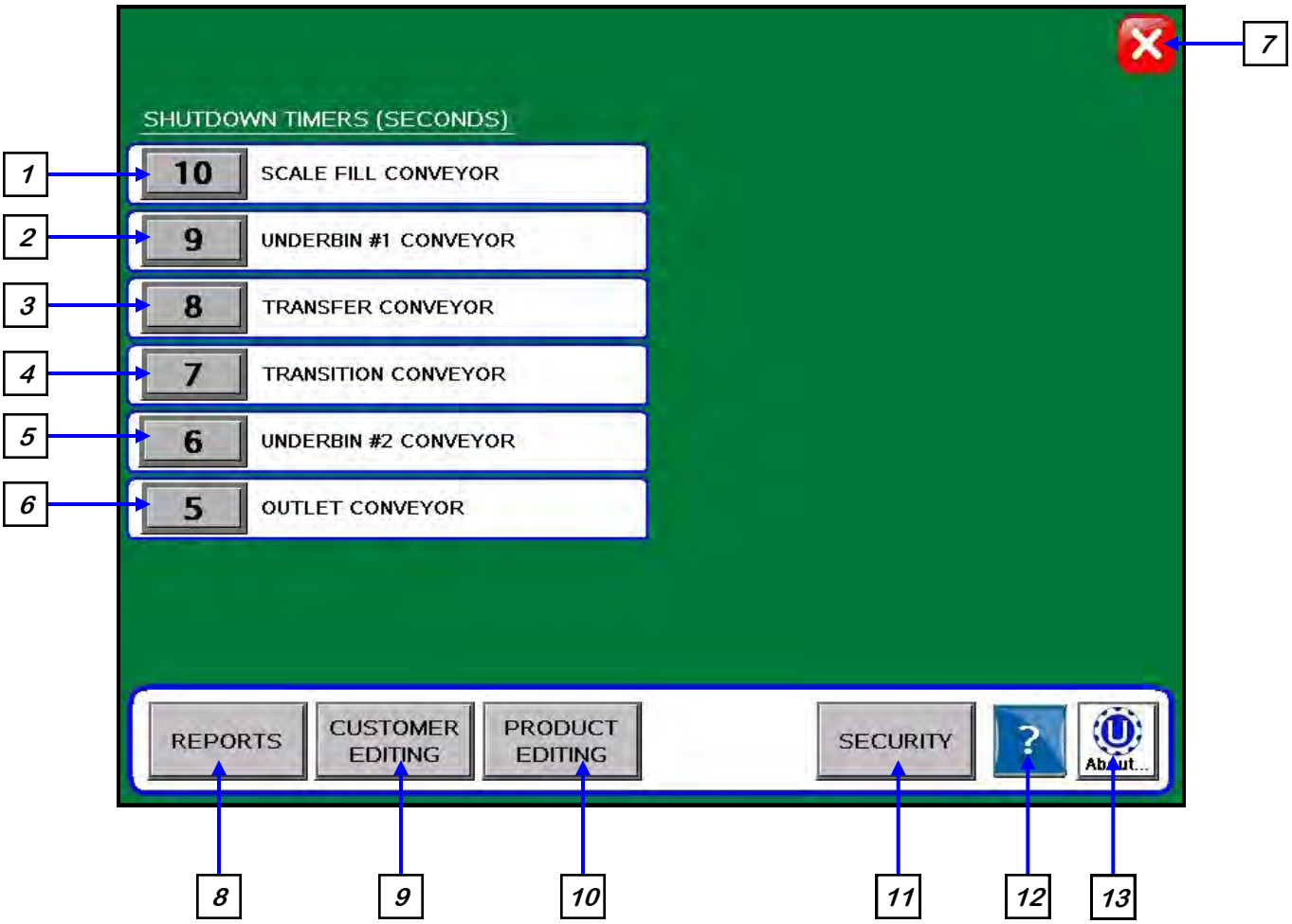
12. BIN SLIDE GATES CONTROL MODULE: This module allows the operator to manually control the operation of the slide gates that are located underneath each bin. The bin slide gates will be opened and closed automatically when the operator presses the START SCALE FILL button on the Main screen.

13. TRI - FLO® INLET DIVERTER INDEX DISPLAY: Informs the operator which one of the three weigh hoppers the diverter is in position to load seed into. The active hopper will be green on the main screen.

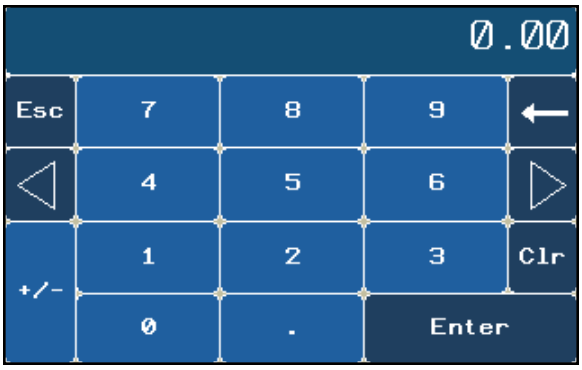
14. DIVERTER CONTROL MODULE (optional): This module controls the function of the diverter. The module allows the operator to choose if the diverter is in the treat or bypass mode. In treat mode seed will be run through the treater and in bypass mode seed will be diverted so that it does not pass through the treater. This module will only be present if the Tri - Flo ® system has a diverter.

TRI - FLO ® UTILITIES SCREEN

This screen allows the operator to set various system parameters and gives access to the Bin Site Reports, Alarms, Security and Customer Info screens.



NOTICE When buttons 1-6 are pressed, a numeric touch pad (right) will appear allowing the operator to enter in a number for that particular parameter.



Utilities Screen Button Descriptions

1. SCALE FILL CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the scale fill conveyor.

2. UNDERBIN #1 CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the underbin #1 conveyor. This timer will begin once the bin slide gate has closed and will allow the underbin conveyor to clean itself out.

3. TRANSFER CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the transfer conveyor. This timer will allow the Pro Box hopper to clean itself out. This button will only be present if the Pro Box hopper is being used.

4. TRANSITION CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the transition conveyor. This timer will allow the transition conveyor to clean itself out.

5. UNDERBIN #2 CONVEYOR SHUTDOWN TIME (optional): Pressing this button allows the operator to adjust the shutdown time of the underbin #2 conveyor. This timer will begin once the batch is finished and will allow the underbin conveyor to clean itself out. This button will only be present if the Tri - Flo ® System has a second underbin conveyor.

6. OUTLET CONVEYOR SHUTDOWN TIME: Pressing this button allows the operator to adjust the shutdown time of the outlet conveyor. This timer will always be set to the longest shutdown time to be sure all other conveyors and the treater have cleared themselves of seed and shutdown.

7. SCREEN EXIT BUTTON: Pressing this button is used to exit back to the previous screen. Its functionality is the same throughout the HMI display.

8. REPORTS BUTTON: Pressing this button advances the operator to the Reports screen (page 62).

9. CUSTOMER EDITING BUTTON: Pressing this button advances the operator to the Customer Editing screen (page 25).

10. PRODUCT EDITING BUTTON: Pressing this button advances the operator to the Product Editing screen (page 24).

11. SECURITY BUTTON: Pressing this button advances the operator to the Security screen (page 20).

12. HELP: Pressing this button takes the operator to the Help Screen where you can find common solutions for problems you may encounter.

13. ABOUT USC BUTTON: Pressing this button allows the operator see what software release is installed in the system.

CALIBRATION & OPERATION

SECTION D

DETERMINING SEED CUP WEIGHT

The following is a list of steps to use when determining seed cup weight. A seed calibration cup, funnel, stand and scale are required.

1. Set the empty seed calibration cup on the scale and zero out the weight of the cup.
2. Place the funnel and stand in the seed to be treated or a separate container (figure 1). This will help to avoid any unnecessary clean-up while filling and leveling the top of the seed calibration cup.
3. Place your hand under the bottom of the funnel and fill the funnel up with seed.

Seed Calibration Cup

4. Place the calibration cup under the funnel stand and remove your hand from the bottom of the funnel, and allow the cup to be filled. (figure 1)
5. After the cup has been filled, strike off the top of the seed calibration cup with a straight edge. (figure 2)

NOTICE Do NOT shake the cup.

6. Weigh the sample of seed. (figure 3)

NOTICE A typical weight of the sample of seed will be anywhere between 2.8 to 4.0 lbs. Anything over or under this range could be caused by not zeroing out the weight of the cup, or the scale may be set on the wrong units.

Figure 1

Figure 2

Figure 3

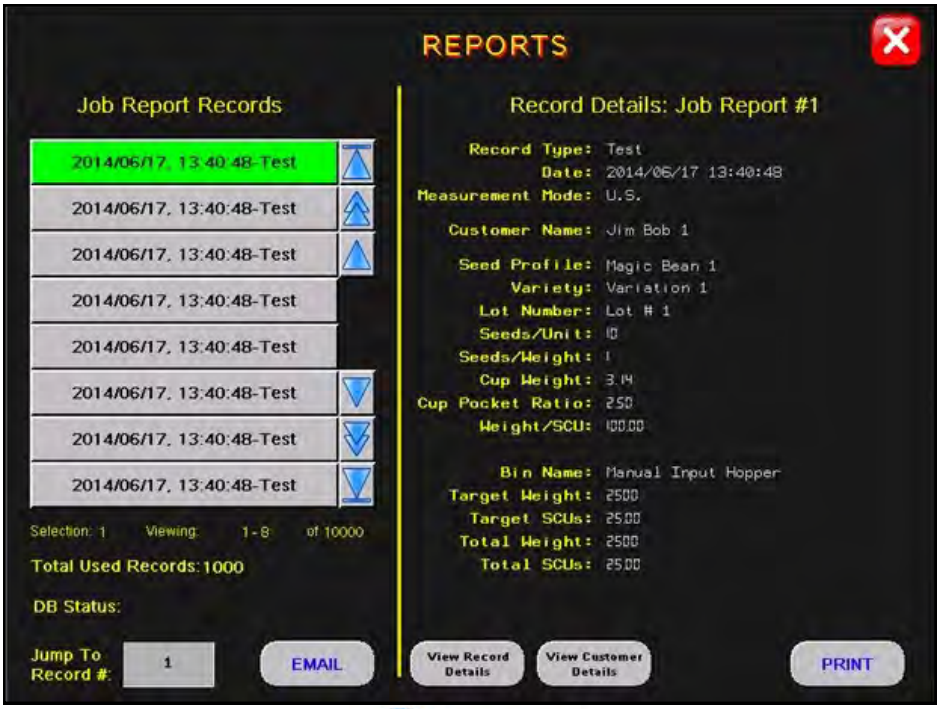
SECTION D-1 GENERAL CALIBRATION & OPERATION

EMAILING & PRINTING REPORTS

The following steps explain how reports are accessed and can be managed after a run has been completed.

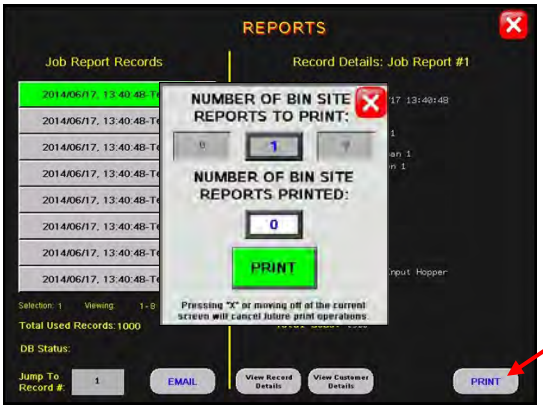
1. After the SHUTDOWN button has been pressed a window will pop-up notifying the operator that the system will shut down after a specified amount of time. (right)

2. Once a run is finished the data is saved automatically under the reports, the operator may access these records from the REPORTS screen (bottom) which can be accessed through the UTILITIES screen. Under the reports screen, on the right side of the screen is a list of report records. To see the details select the record you want and it will show data on the right. To view more details use the buttons on the bottom for more information. If emailing is enabled you will see an email button that allows you to email a specific record. You may also choose to print a record from this screen.

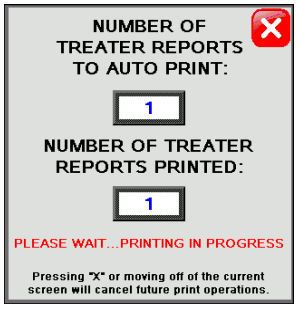


EDITING - PRINTING REPORTS

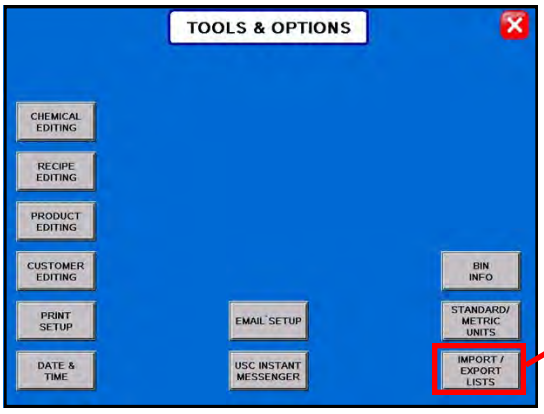
3. Press the PRINT button and a popup window appears. From this screen you can enter the number of reports to print for the customers records. Then press the X in the top right corner of the screen to exit back to the main screen.



4. If the Auto Print Report has been activated on the Print Set-up screen (see page 26) steps 2 and 3 will not be required. The print verification screen will appear and automatically print the number of reports specified.



5. If you would like to erase the reports, press the SECURITY button under the UTILITIES screen to advance to the security screen. Enter the password **USC** and then press the TOOLS & OPTIONS button. From this screen press IMPORT/EXPORT LISTS to go into your records management. On this screen you can find the Job Reports List where you can Export or Delete the records.



DOWNLOADING REPORTS

The USB port located on the bottom of the Main Control Panel allows the operator to download reports to a compact flash device.

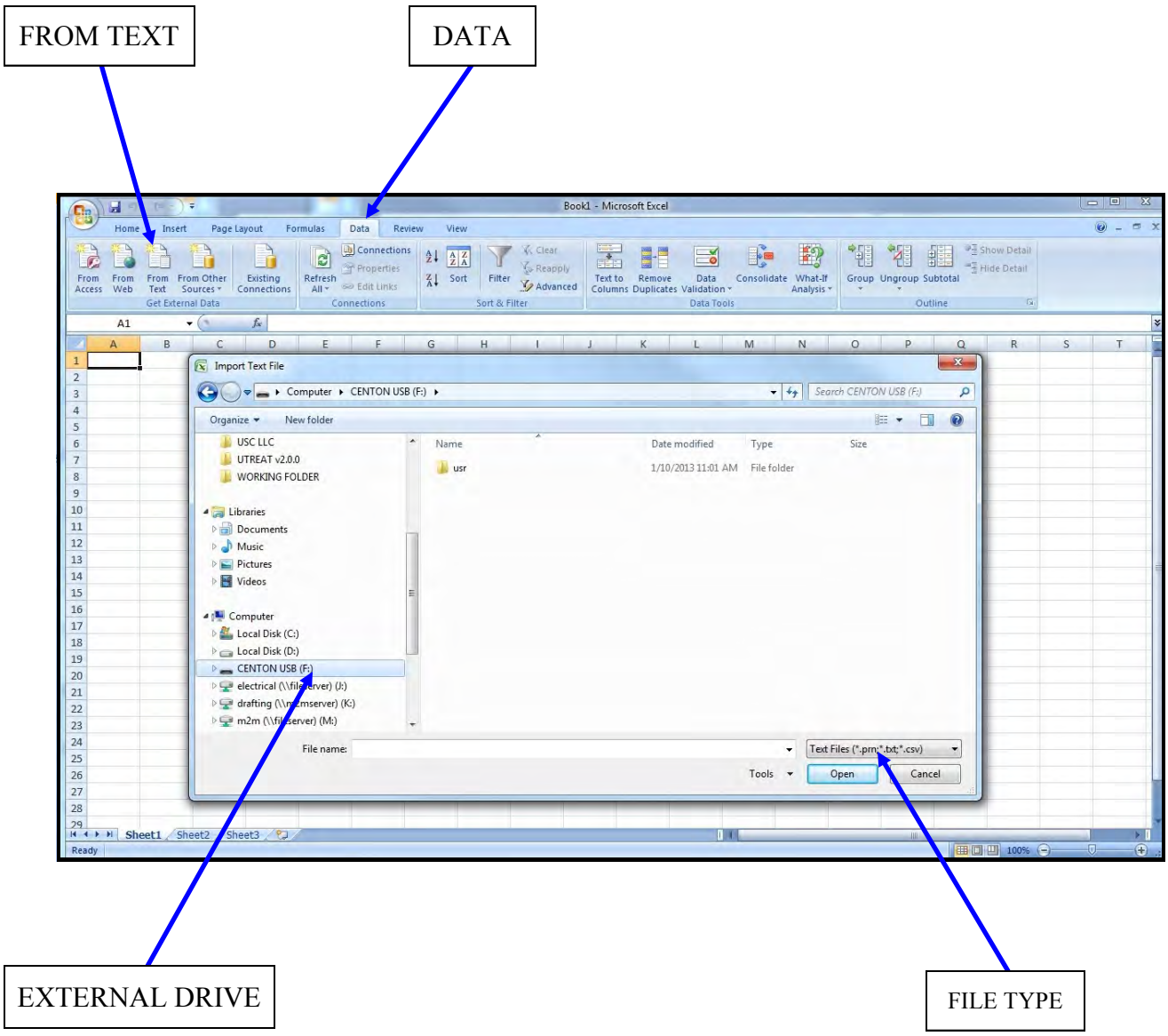
Use the following steps to download reports to a computer.

1. Insert a Compact Flash device into the USB port. The Flash device must be in Fat 32 format.
2. Advance to the Tools & Options screen.
3. Press the IMPORT/EXPORT LISTS button. Find the Job Reports List section and press Export the data transfer status will appear above the export button until it is finished and it will disappear. Once it has disappeared it is finished and you can move to step 4.
4. Remove the compact flash device from the control panel and insert into your computer.

DOWNLOADING REPORTS

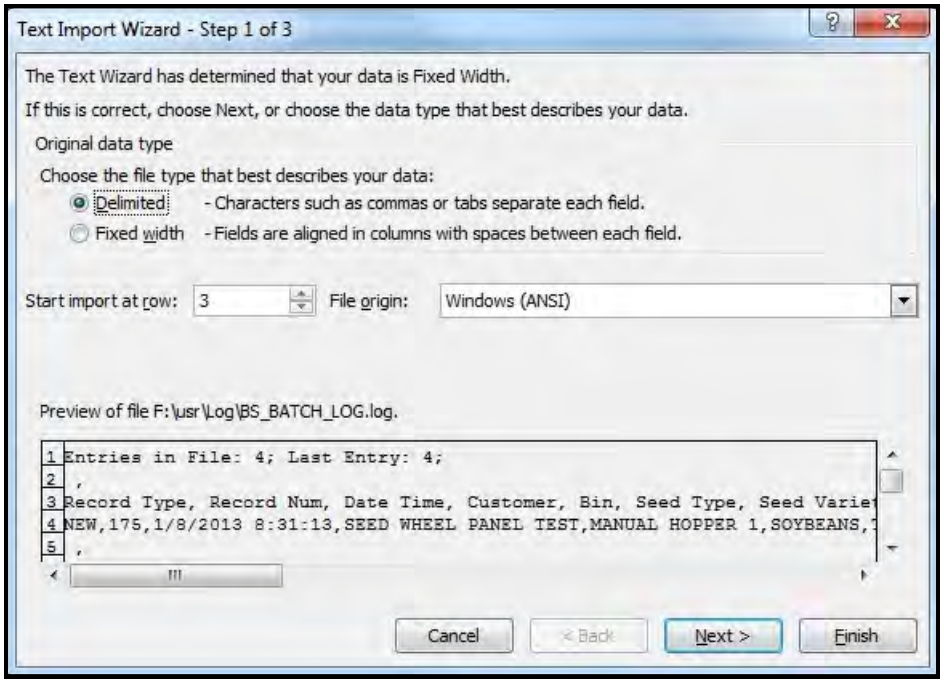
5. Start Microsoft Office Excel. From the top menu select DATA then FROM TEXT.

6. From the Input Text File screen select the appropriate external drive. Then select the folders USR / LOG. Change the file type to ALL FILES. Select the file you want to work with and the Text Import Wizard window will open.

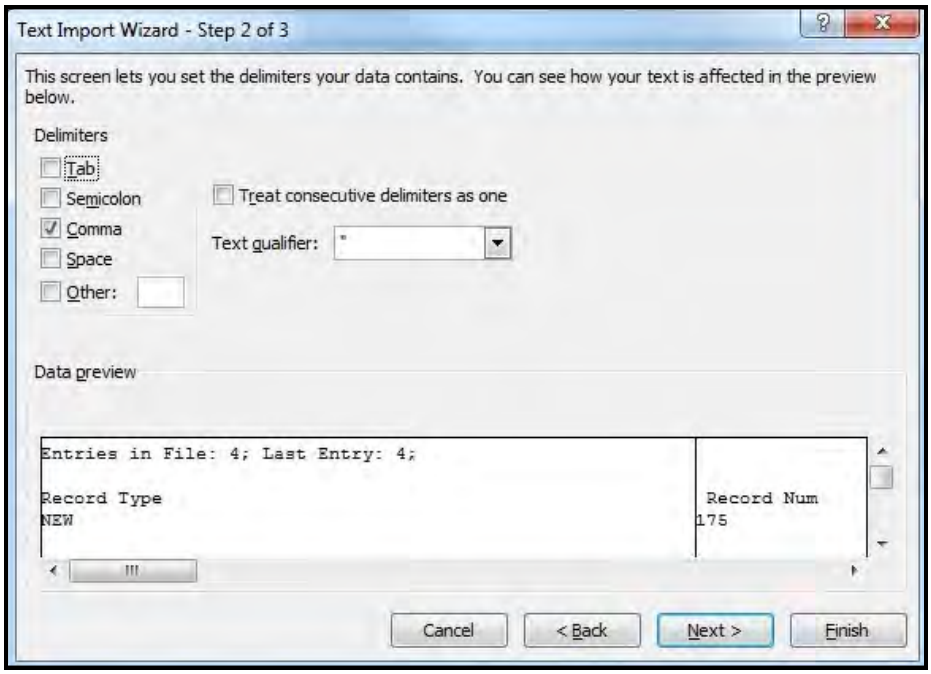


DOWNLOADING REPORTS

7. Under Original data type select Delimited. Change Start import row to 3, then click Next.

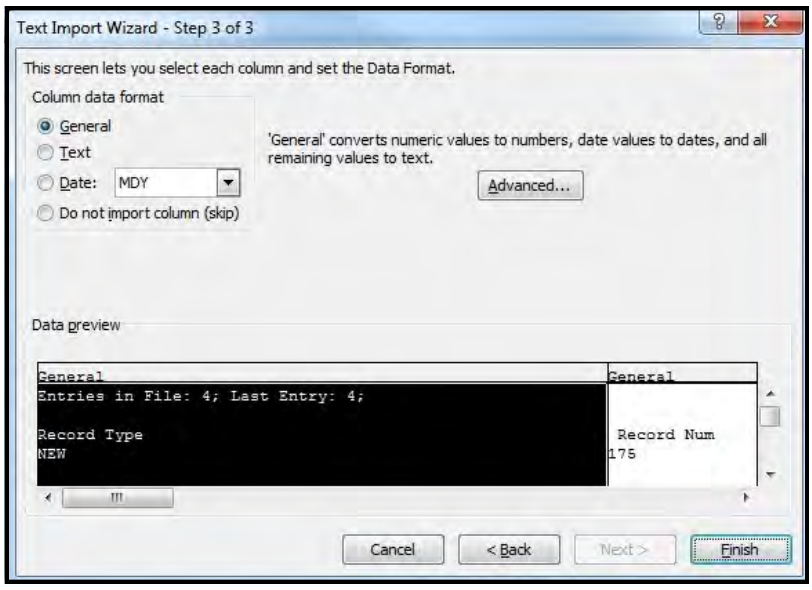


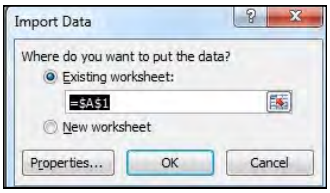
8. Under Delimiters deselect Tab and select Comma. Then click Next.



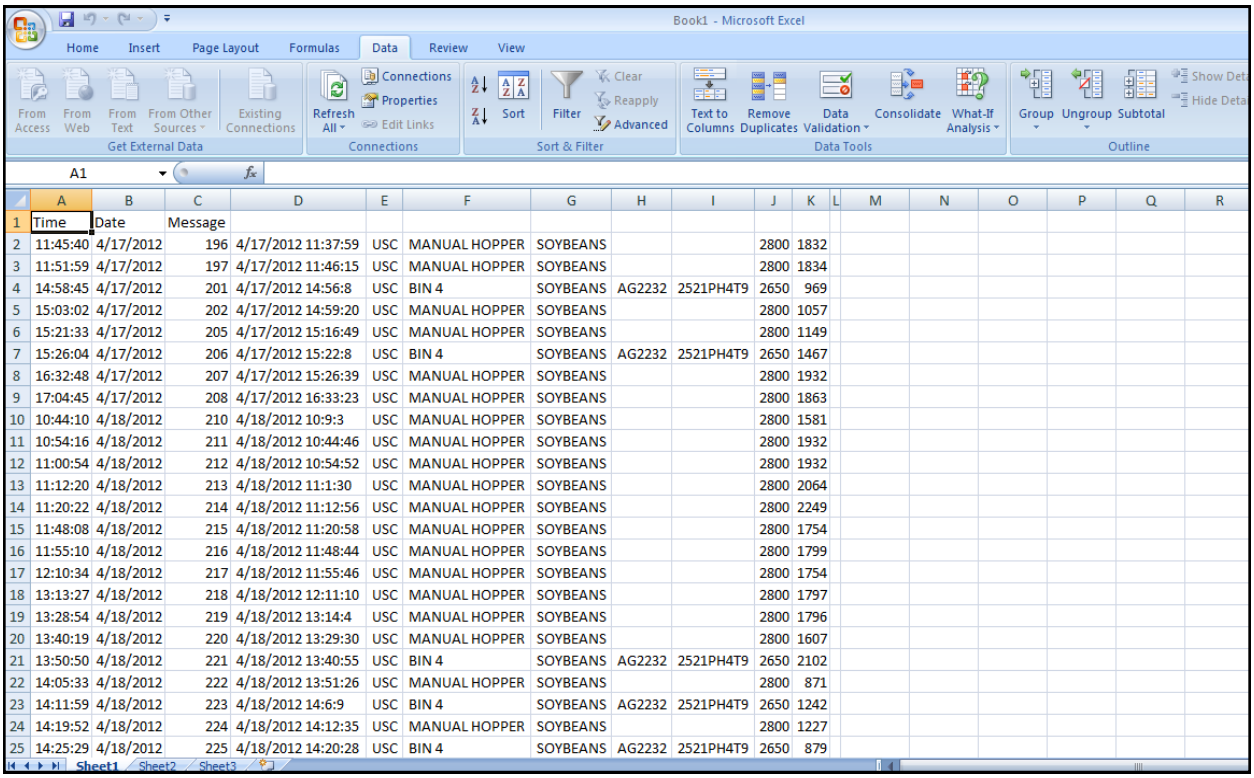
DOWNLOADING REPORTS

9. Click Finish and the Import Data window appears. Click OK.





10. The Report conversion process is complete. In the File menu, click Save As and file the report.

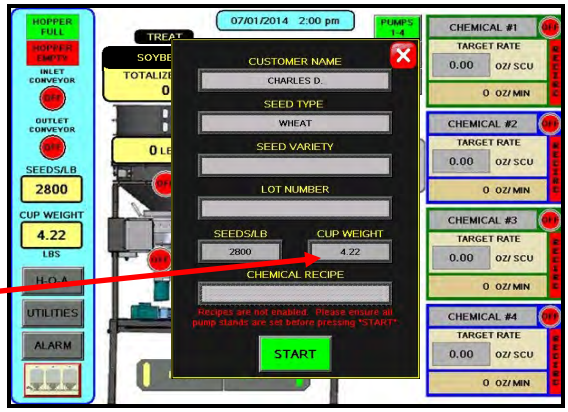


	A	B	C	D	E	F	G	H	I	J	K
1	Time	Date	Message								
2	11:45:40	4/17/2012	196	4/17/2012 11:37:59	USC	MANUAL HOPPER	SOYBEANS			2800	1832
3	11:51:59	4/17/2012	197	4/17/2012 11:46:15	USC	MANUAL HOPPER	SOYBEANS			2800	1834
4	14:58:45	4/17/2012	201	4/17/2012 14:56:8	USC	BIN 4	SOYBEANS	AG2232	2521PH4T9	2650	969
5	15:03:02	4/17/2012	202	4/17/2012 14:59:20	USC	MANUAL HOPPER	SOYBEANS			2800	1057
6	15:21:33	4/17/2012	205	4/17/2012 15:16:49	USC	MANUAL HOPPER	SOYBEANS			2800	1149
7	15:26:04	4/17/2012	206	4/17/2012 15:22:8	USC	BIN 4	SOYBEANS	AG2232	2521PH4T9	2650	1467
8	16:32:48	4/17/2012	207	4/17/2012 15:26:39	USC	MANUAL HOPPER	SOYBEANS			2800	1932
9	17:04:45	4/17/2012	208	4/17/2012 16:33:23	USC	MANUAL HOPPER	SOYBEANS			2800	1863
10	10:44:10	4/18/2012	210	4/18/2012 10:9:3	USC	MANUAL HOPPER	SOYBEANS			2800	1581
11	10:54:16	4/18/2012	211	4/18/2012 10:44:46	USC	MANUAL HOPPER	SOYBEANS			2800	1932
12	11:00:54	4/18/2012	212	4/18/2012 10:54:52	USC	MANUAL HOPPER	SOYBEANS			2800	1932
13	11:12:20	4/18/2012	213	4/18/2012 11:1:30	USC	MANUAL HOPPER	SOYBEANS			2800	2064
14	11:20:22	4/18/2012	214	4/18/2012 11:12:56	USC	MANUAL HOPPER	SOYBEANS			2800	2249
15	11:48:08	4/18/2012	215	4/18/2012 11:20:58	USC	MANUAL HOPPER	SOYBEANS			2800	1754
16	11:55:10	4/18/2012	216	4/18/2012 11:48:44	USC	MANUAL HOPPER	SOYBEANS			2800	1799
17	12:10:34	4/18/2012	217	4/18/2012 11:55:46	USC	MANUAL HOPPER	SOYBEANS			2800	1754
18	13:13:27	4/18/2012	218	4/18/2012 12:11:10	USC	MANUAL HOPPER	SOYBEANS			2800	1797
19	13:28:54	4/18/2012	219	4/18/2012 13:14:4	USC	MANUAL HOPPER	SOYBEANS			2800	1796
20	13:40:19	4/18/2012	220	4/18/2012 13:29:30	USC	MANUAL HOPPER	SOYBEANS			2800	1607
21	13:50:50	4/18/2012	221	4/18/2012 13:40:55	USC	BIN 4	SOYBEANS	AG2232	2521PH4T9	2650	2102
22	14:05:33	4/18/2012	222	4/18/2012 13:51:26	USC	MANUAL HOPPER	SOYBEANS			2800	871
23	14:11:59	4/18/2012	223	4/18/2012 14:6:9	USC	BIN 4	SOYBEANS	AG2232	2521PH4T9	2650	1242
24	14:19:52	4/18/2012	224	4/18/2012 14:12:35	USC	MANUAL HOPPER	SOYBEANS			2800	1227
25	14:25:29	4/18/2012	225	4/18/2012 14:20:28	USC	BIN 4	SOYBEANS	AG2232	2521PH4T9	2650	879

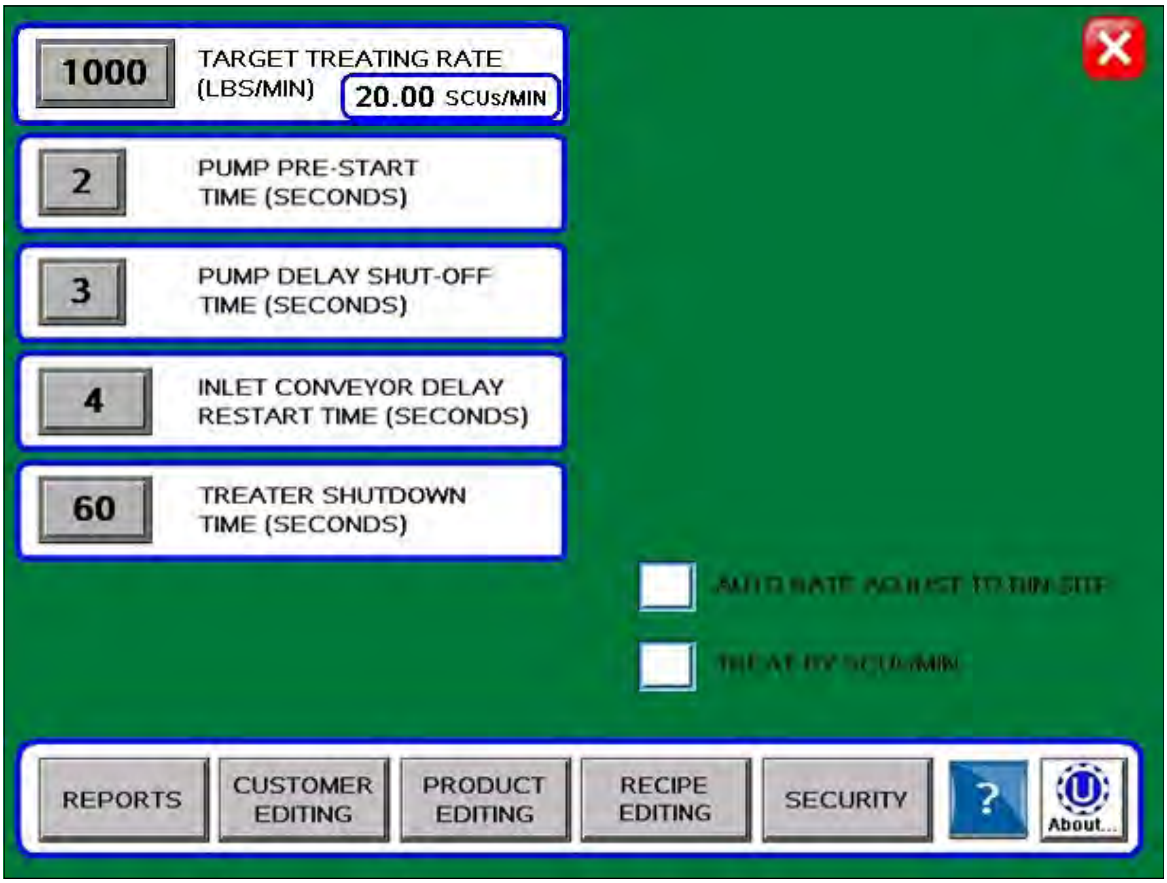
SECTION D-2 LPX TREATER CALIBRATION & OPERATION

SEED FLOW CALIBRATION

1. Take the weight of the seed sample and enter it into the startup wizard under CUP WEIGHT and select the correct seed type then exit the startup wizard window.

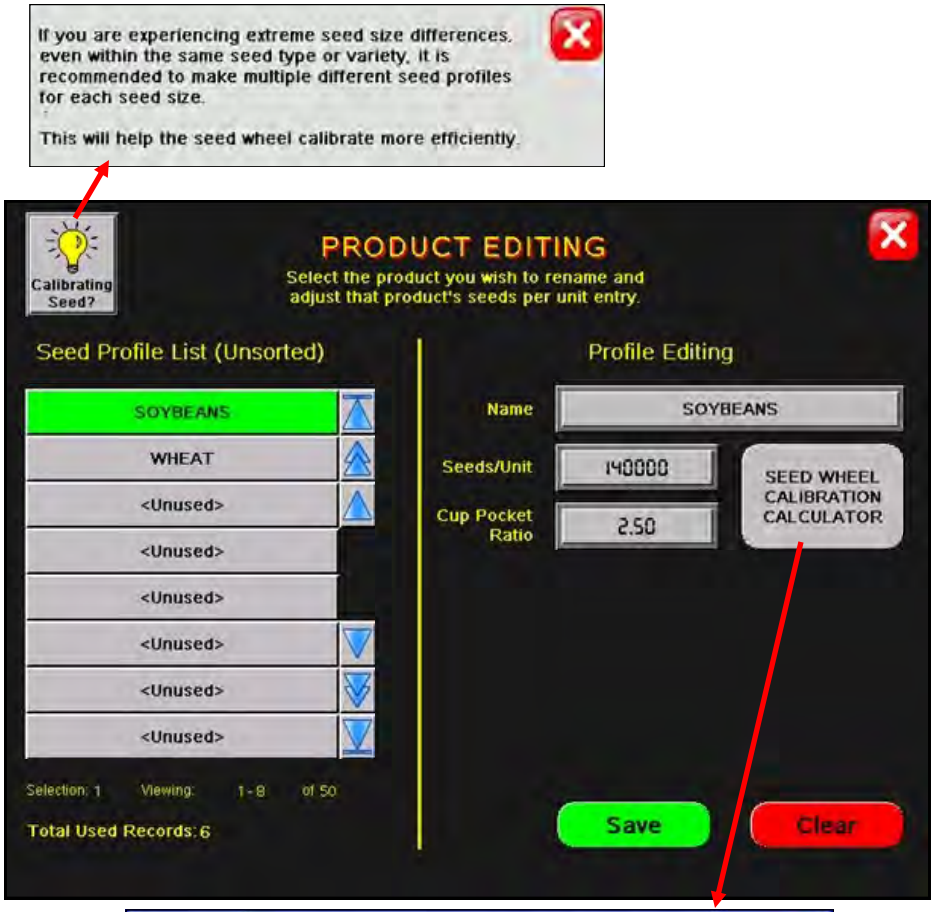


2. Press the UTILITIES button on the main screen to advance to the utilities screen. Enter in the TARGET TREATING RATE in pounds per minute. Also at this time fill in all other parameters on this screen. Below is a screen shot of the utilities screen with typical numbers to use when beginning to treat.



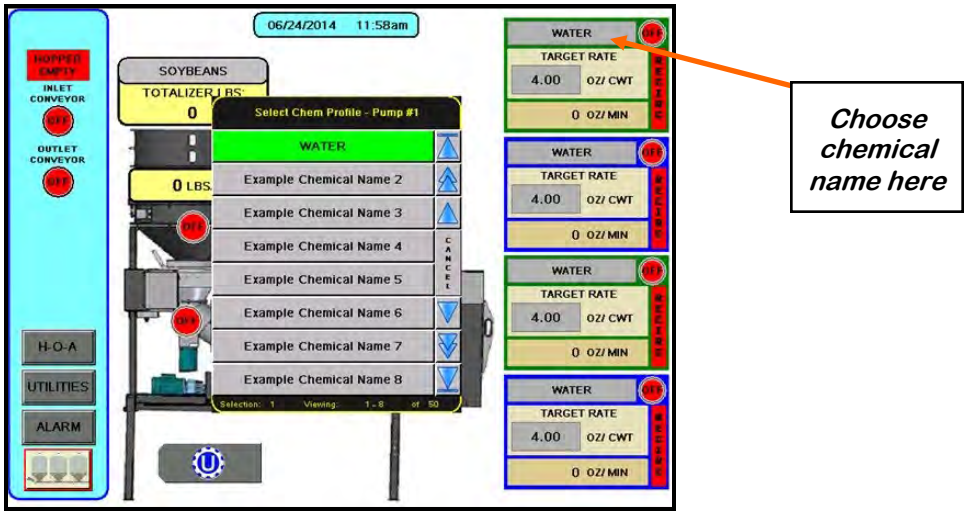
SEED FLOW CALIBRATION

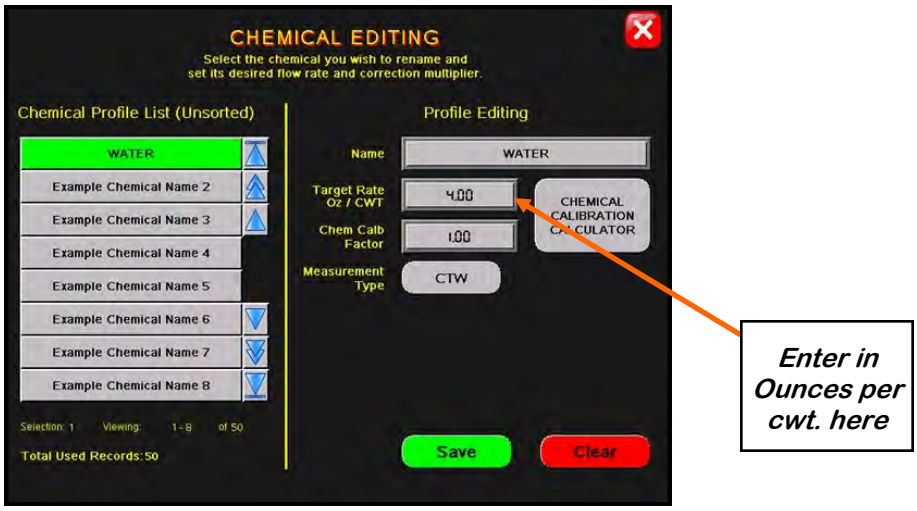
3. Next, press the PRODUCT EDITING button to advance to the product editing screen. Select the type of seed you will be treating on the left side of the screen from the list. The seed profile details will populate on the right where it can be edited and the seed wheel can be calibrated for that seed. The operator must press SAVE before leaving the profile if any changes were made or the changes will be lost and go back to what was previously set to that profile.



PUMP CALIBRATION

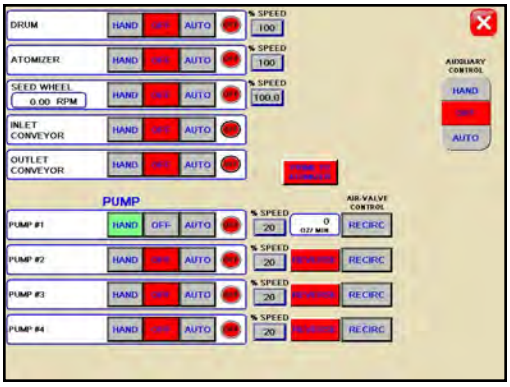
1. Lock down the pump tubing in the pump head.
2. Premix enough liquid for the amount of seed you are treating and pour into the chemical mix tank. It's always a good practice to mix an extra half gallon of slurry to help fill all the lines.
3. On the automated mix tank control panel, place the mix tank motor to the ON position. This will ensure that the chemical mixture within the mix tank is blended appropriately.
4. From the MAIN screen, select the chemical name box from the desired pump module and a selection window appears. Choose the type of chemical you will be applying. Press the TARGET RATE box below the chemical name on the main screen and you will be taken to the CHEMICAL EDITING screen. Select the RATE box next to the applicable chemical name and use the keypad to enter the value. See CHEMICAL EDITING on page 22 for more detail.



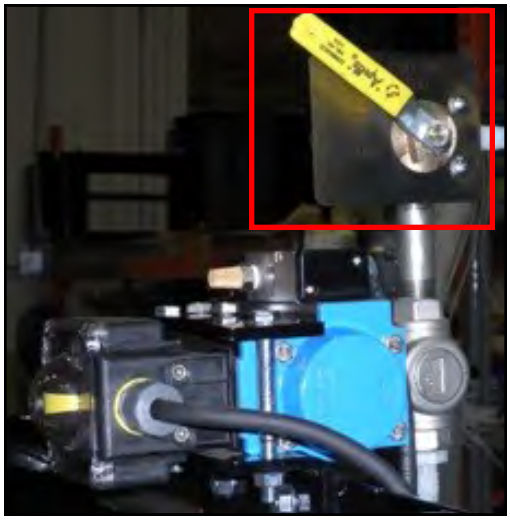


FLOW METER CALIBRATION

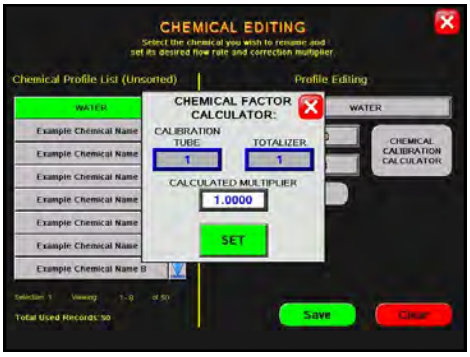
Due to the composition of some types of chemicals, additional flow meter calibration may be required. It is recommended that, like other calibration devices, the flow meter(s) is checked regularly and calibrated when needed. When calibrating the flow meter(s), each chemical slurry must be checked and adjusted for.



1. To begin the calibration process, fill the appropriate mix tank with the slurry that is going to be used for this calibration.
2. Turn the corresponding pump to the hand position and adjust the flow rate until it reads about 20 percent on the pump control module (top). Let the system run in recirculation mode for 15 minutes. This will remove any air from the system.
3. Using a stop watch, place the MIX TANK/ CALIBRATION TUBE valve that is located on top of the mix tank (middle) to the calibration tube position and begin timing for one minute. When one minute is up, place the valve back in the mix tank position. Note the total ounces of chemical that is in the calibration tube. Also, note the reading of the flow meter on the main screen.



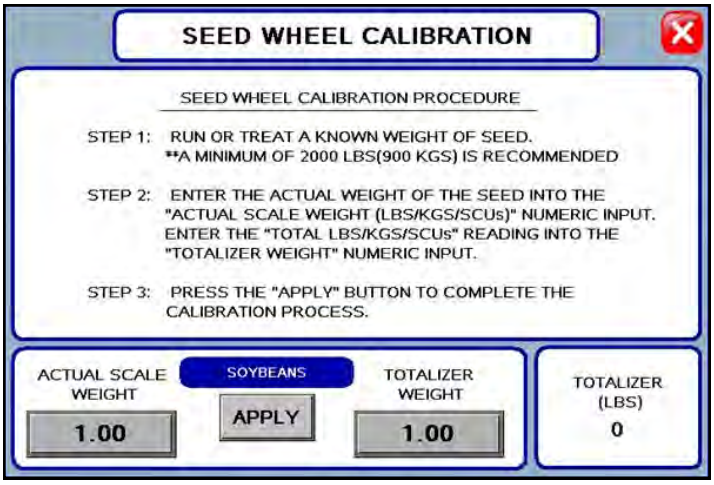
4. From the Edit Chemical Screen (bottom) press the button for the corresponding chemical and the Chemical Factor Calculator appears. Enter the calibration tube ounces into the calibration tube box and the flow meter reading into the totalizer box. Press the SAME button and it will automatically calculate the multiplier and enter it for that chemical.
5. Exit to the main screen and re-select the chemical name to set the new multiplier and ensure proper calibration on this chemical. The multiplier will not show up on the screen but will be used by the system for calibration purposes.
6. Repeat the process as necessary and for each different chemical slurry used.



SEED WHEEL CALIBRATION

1. If the totalized weight from the seed wheel differs from the actual weight of the seed that was ran through the treater. The seed wheel can be calibrated to increase accuracy. Press the Utilities button on the Main screen. Next, press the PRODUCT EDITING button, here you will choose the product and press the SEED WHEEL CALIBRATION button (top). This will advance you to the Seed Wheel Calibration screen (bottom).
2. Enter in the ACTUAL SCALE WEIGHT of the seed that was treated, and the TOTALIZER WEIGHT from what the seed wheel recorded.
3. Press the APPLY button. The PLC will automatically calibrate the seed wheel and exit back to the main screen.

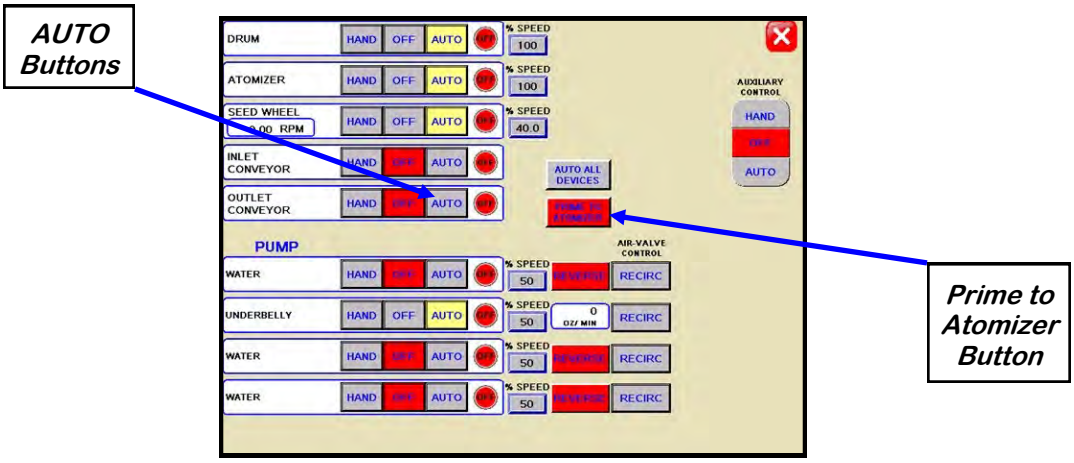
Note: The seed wheel calibration screen will adjust the seed profiles Cup Pocket Ratio automatically.



TREATING SEED

1. Under the H-O-A screen, place the DRUM, ATOMIZER, SEED WHEEL, INLET CONVEYOR, OUTLET CONVEYOR and desired pumps in AUTO.

2. Next, prime the chemical line to the atomizer. Ensure that the valve on each of the chemical attachment ports on the treater are in the correct position. Then, press and hold the PRIME TO ATOMIZER button. The atomizer will turn on and liquid will begin pumping up to the atomizer. When liquid reaches the atomizer release the PRIME TO ATOMIZER button.



3. Return to the main screen and press the START button. The startup wizard screen appears. Press the gray button to change any fields such as customer, seed type, cup weight etc. Press START to begin the run. The drum, atomizer, inlet conveyor and outlet conveyor will activate. The pump will turn on and re-circulate until it reaches the desired flow rate needed to match the target treating rate that was entered. The inlet conveyor will then begin dumping seed into the seed wheel.

TREATING SEED

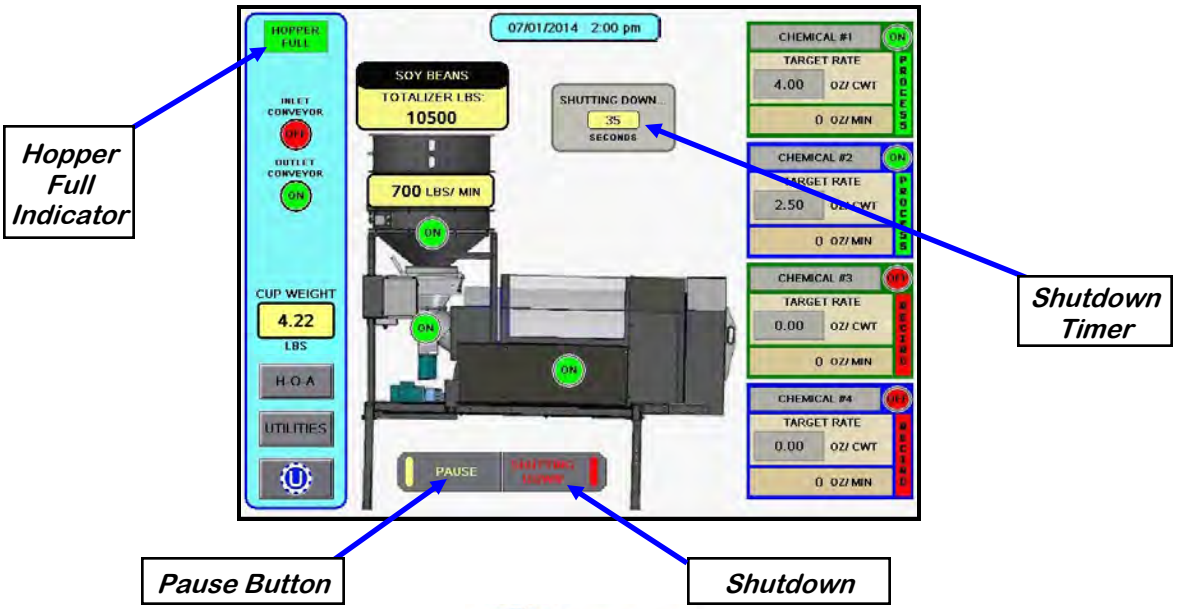
4. When the pump's flow rate has been reached and seed is covering the proximity sensors inside of the seed wheel, the air actuated 3-way valve will open and allow liquid to pump up to the atomizer. A moment later (based on the settings in the utilities screen), the seed wheel will turn on and the seed treating process will begin.

5. As the seed is being treated, the main screen will display the pounds per minute, the total pounds, and the liquid flow rate. If the system needs to be stopped for a moment because of a problem. The PAUSE button can be pressed to halt the process. When ready to begin again, the CONTINUE button is pressed.

6. When the seed wheel hopper is full the HOPPER FULL indicator light will come on and the inlet conveyor will shut off. The flow of seed into the treater will begin again once seed is no longer present at the top proximity sensor in the hopper and the Inlet Conveyor Delay Restart time defined on the utilities has expired. This is done to ensure that seed will not overfill the hopper and flow onto the ground.

7. When all seed passes through the seed wheel, the seed wheel will turn off and the pump will switch to re-circulate. When more seed is fed into the treater, the treating process will continue.

8. After all seed has been treated the inlet conveyor and the seed wheel will shutdown automatically. The 3-way valve on the pump stand will switch to re-circulate. However, the atomizer, drum and outlet conveyor will still be running. Press the SHUTDOWN button at the bottom of the screen and the shutdown timer appears and begins to count down the seconds left before complete shutdown. The operator decides how much time is adequate for all product to clear the drum and outlet conveyor. The time is entered on the utilities screen and can be adjusted whenever necessary.



BATCH HOPPER CALIBRATION & OPERATION

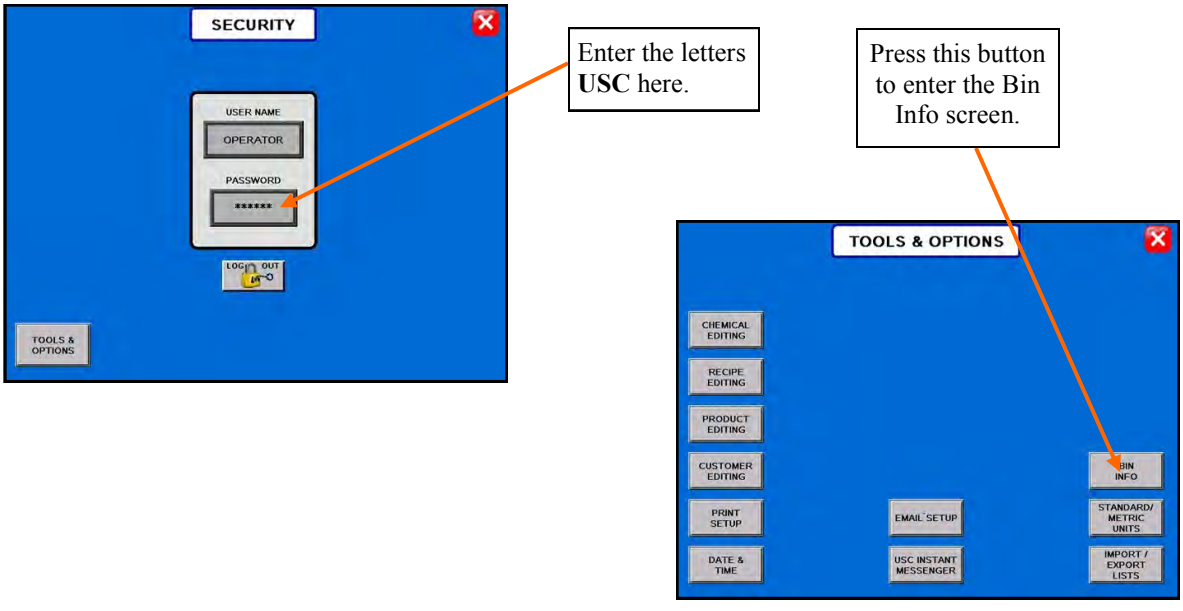
SECTION D-3

LOADING SEED INTO BINS

Before seed is pulled out of the bins and run through the batch hopper system, all the applicable information about the seed that was loaded into each individual bin must first be entered into the batch hopper system. If the same seed was loaded into multiple bins the same information still needs to be loaded into each bin separately.

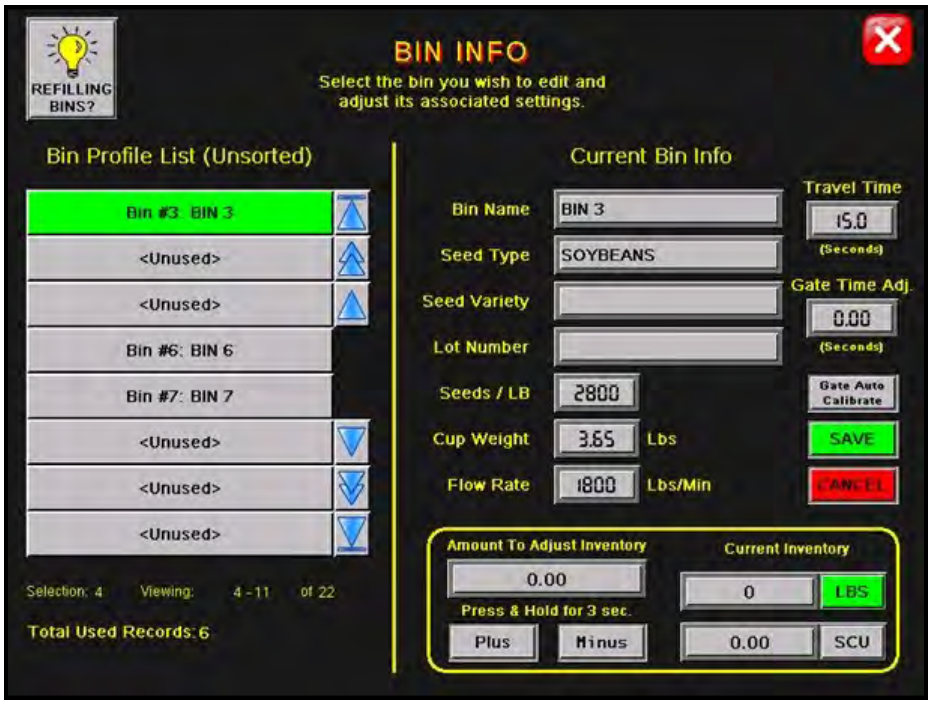
The following is a list of steps to perform to enter the bin information for each bin once seed has been loaded into that bin:

1. Load the seed into the bin. Take a seed sample for the cup weight of each bin at this time. Also, note the seed type, seed variety, lot number, seed weight and total inventory weight of the seed that is loaded into the bin. The seed weight can be defined in either pounds, seed count units or seed weight units.
2. Press the UTILITIES button in the lower left corner of the Bin Site main screen.
3. Press the SECURITY button on the bottom of the Utilities screen.
4. Press the PASSWORD box, then from the popup keyboard enter the letters USC and press enter.
5. Press the TOOLS & OPTIONS button in the lower left hand corner of the Security screen.
6. Press the BIN INFO button on the Tools & Options screen.



LOADING SEED INTO BINS

7. Select the desired bin to enter information into from the select bin list..
8. Enter the seed type, seed variety, lot number, seeds per pound and cup weight of the seed in the bin into their respective box under the Current Bin Info.
9. Enter in the total weight of seed that was added to the bin into the bin inventory section on the lower portion of the screen. The system will automatically subtract inventory after each run. Press the save button when all the information has been entered.
10. When finished, exit back to the Main screen.



SETTING THE SEED FLOW RATE

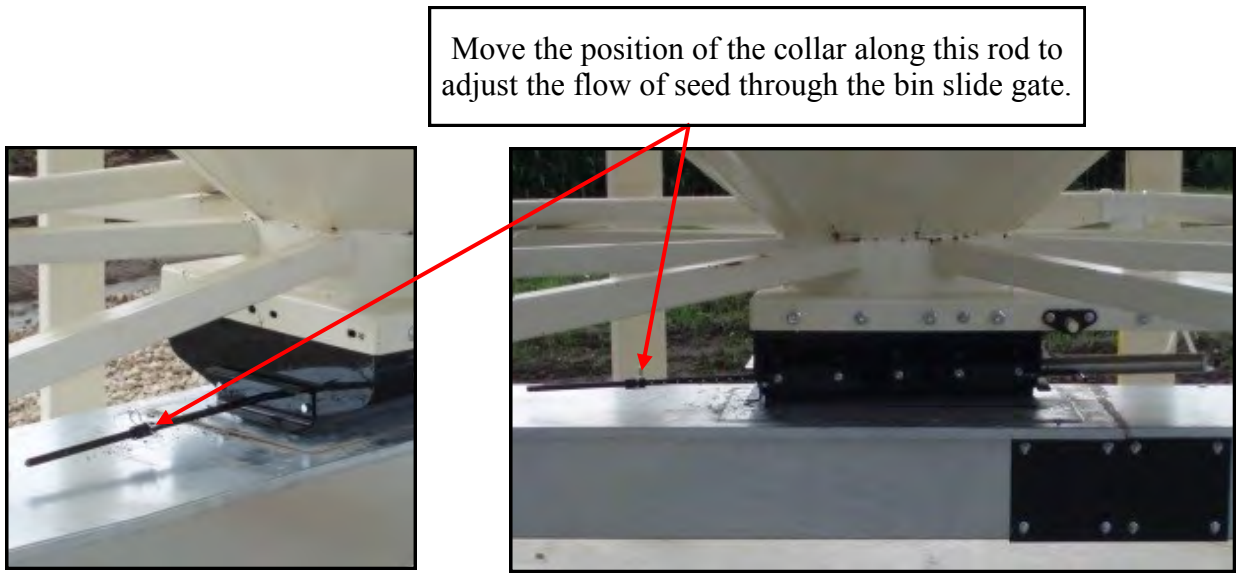
The following is a list of steps for setting the seed flow rate. This must be completed before running the batch hopper system. Repeat steps 1 & 2 for each bin.

1. Set the manual gate on the bin to the fully open position. Once opened, this gate should be set in place and not moved through out the entire season. If this gate is adjusted during a run or between runs then it will effect the calibration of the system and the system will need to be re-calibrated. (page 82)

2. Set the stop for the air actuated slide gate on the bin. This stop controls how far the slide gate will open and the flow rate at which seed can exit the bin. To set the stop, adjust the position of the collar on the rod that exits the slide gate opposite of the air valve (below). Placing the collar closer to the slide gate will restrict flow and farther away from the slide gate will increase seed flow for the system. Once a collar location has been selected, use the hitch pin to lock the collar in place. If the stop is adjusted between runs then it will effect the calibration of the system and the system will need to be re-calibrated. (page 82)

NOTICE It is recommended to initially place the collar closer to the slide gate and then move it farther away from the slide gate one hole at a time to increase the flow rate of the system. This will protect against overloading the underbin conveyor with seed.

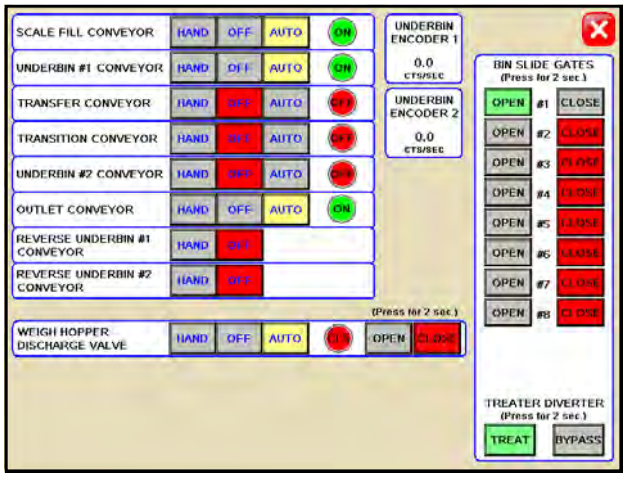
3. Finally, set the position of the manual slide gate that is located under the weigh hopper. This gate will control the flow of seed out of the weigh hopper by restricting the size of the opening from the weigh hopper. The more open the gate is, the faster seed will exit the weigh hopper. To set this gate, simply loosen the three nuts on the gate. Then adjust the gate to the desired position, and retighten the nuts.

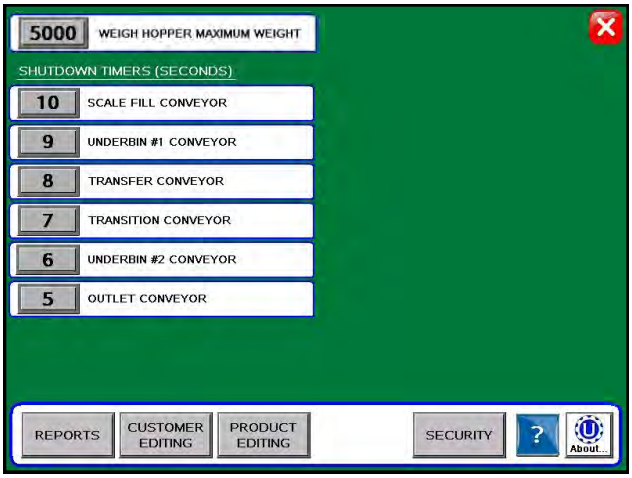


SCALE FILL FROM BIN

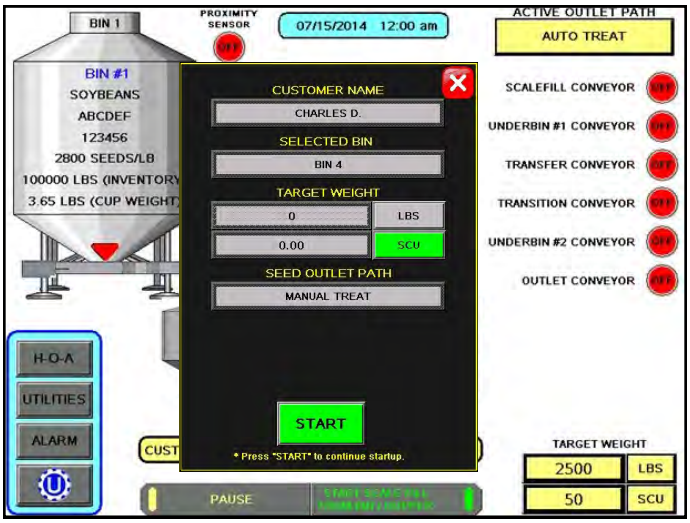
The following is a list of steps to use when running the batch hopper system in the Scale Fill From Bin mode of operation. This allows the operator to automatically fill the scale from the bin.

1. Under the H-O-A screen place all necessary conveyors into the AUTO mode of operation. (below left) Ensure that the diverter is in the appropriate position as well.
2. Under the Utilities screen, ensure that all settings are appropriate. (below right)





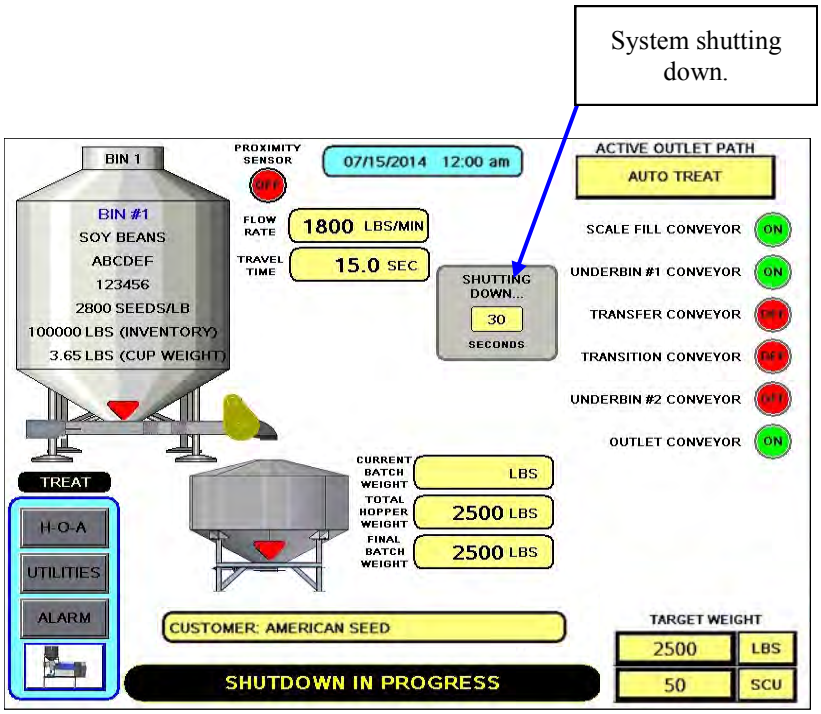
3. Select the bin that you wish to call seed from by pressing the START SCALE FILL FROM BIN/HOPPER button on the Main screen and press the gray button under selected bin then select the bin from the pop-up window. (right)



4. Next press the seed outlet path button and then select either AUTO TREAT or MANUAL TREAT / BYPASS mode of operation depending upon what you plan to do with the seed once it has been pulled from the bin and weighed by the batch hopper system.
5. In the box labeled TARGET WEIGHT enter the amount of weight that is to be brought into the batch hopper on this run.
6. Press the box labeled CUSTOMER at the top of the startup wizard and enter in the current customer's name in the search box or scroll through the list with the navigation buttons.

SCALE FILL FROM BIN

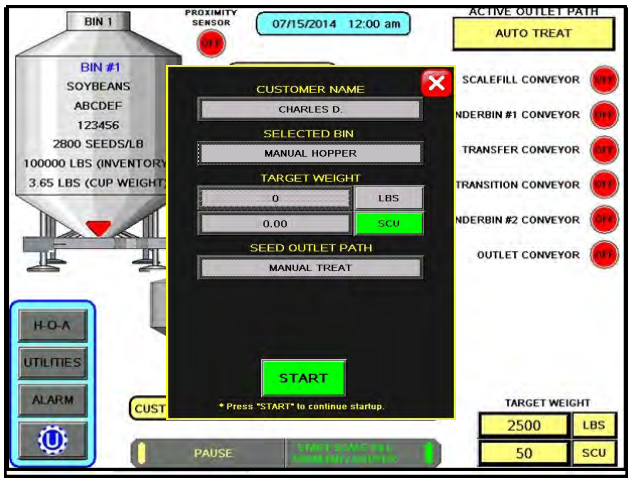
7. Once all fields are set press START from the pop-up screen. This toggles the start button to CANCEL SCALE FILL FROM BIN and activates the PAUSE button. The system will first turn on the scale fill conveyor and then the underbin conveyor. Once all needed conveyors are running, the slide gate for the selected bin will open and seed will flow through the conveyors to the batch hopper.
8. As the batch hopper system is running, the main screen will display the total pounds of seed in the weigh hopper, and the status of the conveyor motors.
9. The slide gate on the bin will automatically close once the target weight in seed passes through the slide gate. Once the gate closes, a window will appear notifying the operator that the batch is finishing. It will then be replaced with another window indicating amount of time before the system shuts down. If operating in the Manual Treat mode the treater will have to be turned on and off separately. The system will then shutdown the conveyors in reverse order of startup. This will ensure the conveyors have an opportunity to clean out any product from them. (right)
10. If the system is running in the AUTO TREAT mode the hopper gate will open automatically at the appropriate time. In the MANUAL TREAT mode the operator must go to the H.O.A. screen, place the Weigh Hopper Discharge Valve in the HAND mode and press and hold the OPEN button. There may be other names set for different outlet paths an operator may see based on different configuration settings.

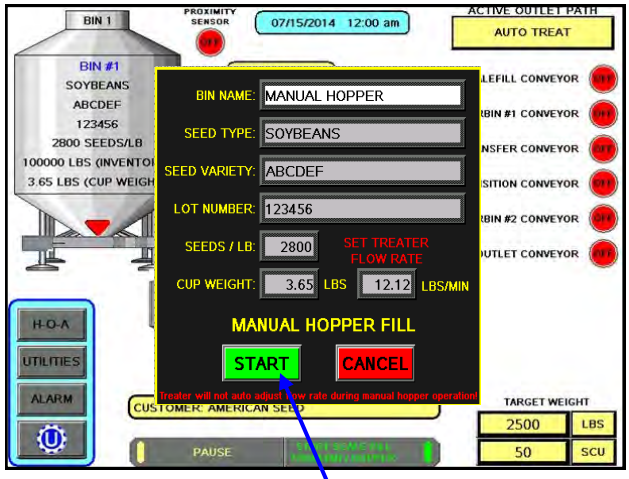


CALLING IN SEED FROM PRO BOXES

The following is a list of steps to use when running the batch hopper system using the START SCALE FILL FROM BIN/HOPPER button. This button will automatically move seed from the manual hopper, via the transfer conveyor, to the scale.

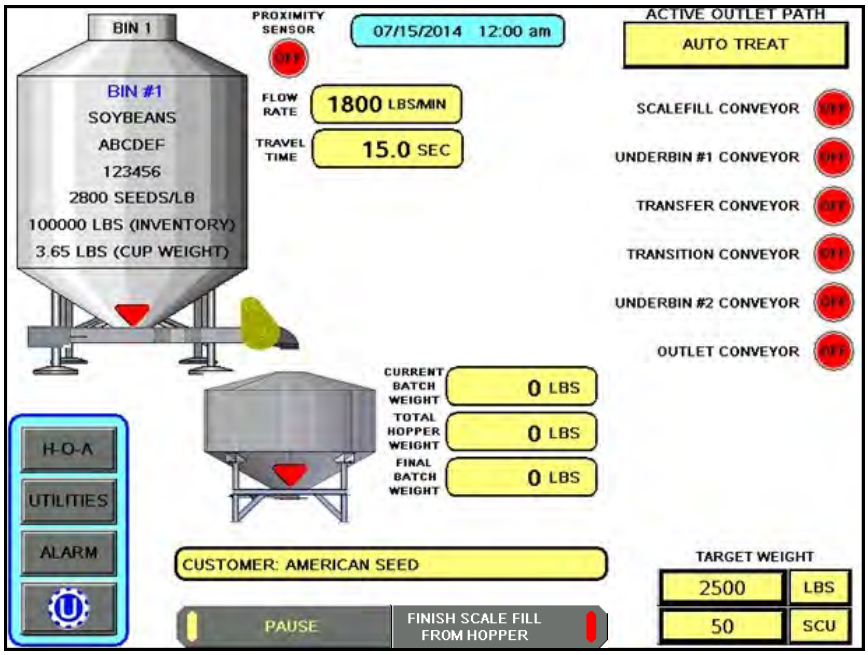
1. Under the H-O-A screen place all necessary conveyors into the AUTO mode of operation. Depending upon the setup of the equipment, some bin sites will require only the transfer conveyor or the scale fill conveyor to be in AUTO mode and some sites will require the transfer, underbin and scale fill conveyors to all be in the AUTO mode. Ensure that the diverter is in the appropriate position as well.
2. Under the Utilities screen, ensure that all settings are appropriate.
3. Press the START SCALE FILL FROM BIN/HOPPER button and under Bin Select button choose MANUAL HOPPER.
4. Press the Seed Outlet Path button and then select either AUTO TREAT or MANUAL TREAT mode of operation depending upon what you plan to do with the seed once it has been pulled from the Pro Box and weighed by the batch hopper system. There may be other names set for different outlet paths an operator may see based on different configuration settings.
5. Press START button at the bottom of the startup wizard screen. The MANUAL HOPPER FILL window will pop up. Once all seed information is correct press START. The system will first turn on the scale fill conveyor, the underbin conveyor, then the transfer conveyor (If applicable) and the outlet conveyor (If applicable).





CALLING IN SEED FROM PRO BOXES

6. As the batch hopper system is running, the Main screen will display the total pounds of seed in the batch hopper. If the system needs to be stopped for a moment because of a problem, the PAUSE button can be pressed to halt the process. When ready to begin again, the CONTINUE button is pressed.
7. Once all of the seed has passed from the manual hopper, through the conveyors and through the weigh hopper, press the FINISH SCALE FILL FROM HOPPER button. At this point, the conveyors will shutdown in reverse order of startup.
8. The system will automatically print the report for the run from the scale head printer.



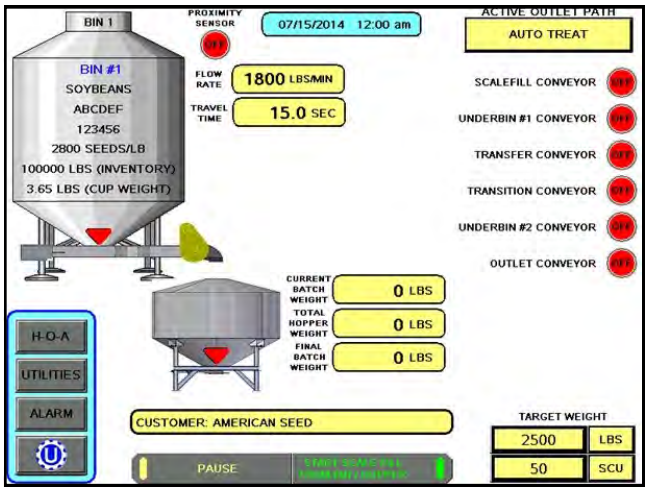
BATCH HOPPER CALIBRATION

Once the initial calibration is established, the system continuously updates the seed flow rate. The calibration is based upon time and weight. The system first calculates the amount of time it takes for the seed to travel from the bin slide gate to the weigh hopper. This is called the travel time. Then the system calculates how long it takes to fill the weigh hopper. This allows the system to calculate the seed flow rate of pounds per minute. Finally, the system uses the travel time and seed flow rate to calculate the amount of seed in the conveyors at any given time. Once this weight is known, it will automatically close the bin gate at the appropriate time to reach the target weight of seed that the operator has entered.

Initial calibration procedure:

1. Set the bin collar in the fourth hole from the end of the rod in. This sets the Flow Rate at approximately 1200 pounds. Adjust as needed (each hole adjusts up or down by approximately 200 pounds). These figures are based on Soybeans.
2. From the main screen check the Flow Rate to verify it is at the default setting of 1800 lbs/min and the Travel Time is at it's default of 15.0 sec. Then set your Target Weight at 2000 pounds. This Target Weight is recommended but not necessary depending on the setup. After the run, check to see if the Flow Rate and Travel Time have changed from the default settings. If they have the system has been successfully calibrated. Each bin must be individually calibrated. As long as there have been no pauses or alarms the system will re-calculate and update the flow rate display after the run is complete. For the Travel Time to update, there must be seed in the hopper before the bin slide gate closes

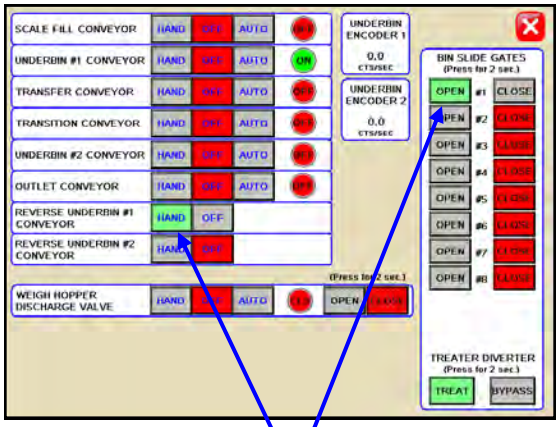
NOTE: If you change the location of the bin collar or the bin runs out of seed before the Target Weight is reached the system will need to be re-calibrated.



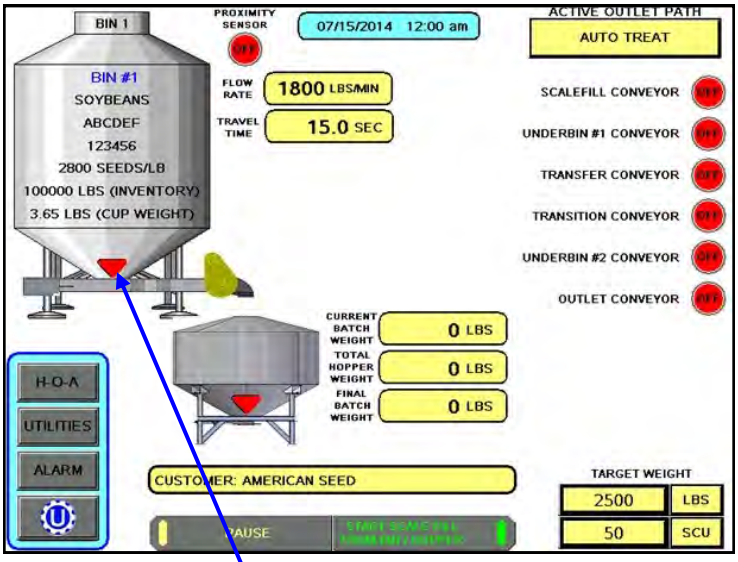
UNDERBIN OPERATION IN REVERSE MODE

The following is a list of steps to use when running the batch hopper system using the REVERSE mode. This mode of operation will allow the operator to clean out the underbin conveyor and to remove any excess seed from the bins at the end of the treating season. **ALWAYS ENSURE THE BELT IS IMMEDIATELY AND PROPERLY ALIGNED WHEN RUNNING IN REVERSE! BELTS WILL OFTEN SHIFT ALIGNMENT WHEN THEIR DIRECTION OF TRAVEL IS REVERSED.**
The REVERSE UNDERBIN CONVEYOR for the underbin conveyor will only be present if the batch hopper system has the reversing option for the underbin conveyor.

1. Place a conveyor and seed storage container under the reversing end of the underbin conveyor to catch seed as it exits the underbin conveyor. Turn that conveyor motor on.
2. Under the H-O-A screen place the REVERSE UNDERBIN CONVEYOR operation in the HAND mode. (top) Ensure that the belt on the underbin conveyor is correctly aligned.
3. Then, manually place the desired bin slide gate to the OPEN position. (top)
4. The batch hopper main screen will show the underbin conveyor on and the bin slide gate in the open position. (bottom)
5. Once all seed has passed through the underbin conveyor and into the seed container, place the open bin slide gate back to the CLOSED position.
6. Allow the underbin conveyor to run for at least 15 seconds. This will allow the underbin conveyor to clean itself out. Then place the underbin conveyor motor back to the OFF position.



Press the HAND button and then place the bin slide gate to the OPEN position.



Slide Gate Indicator.

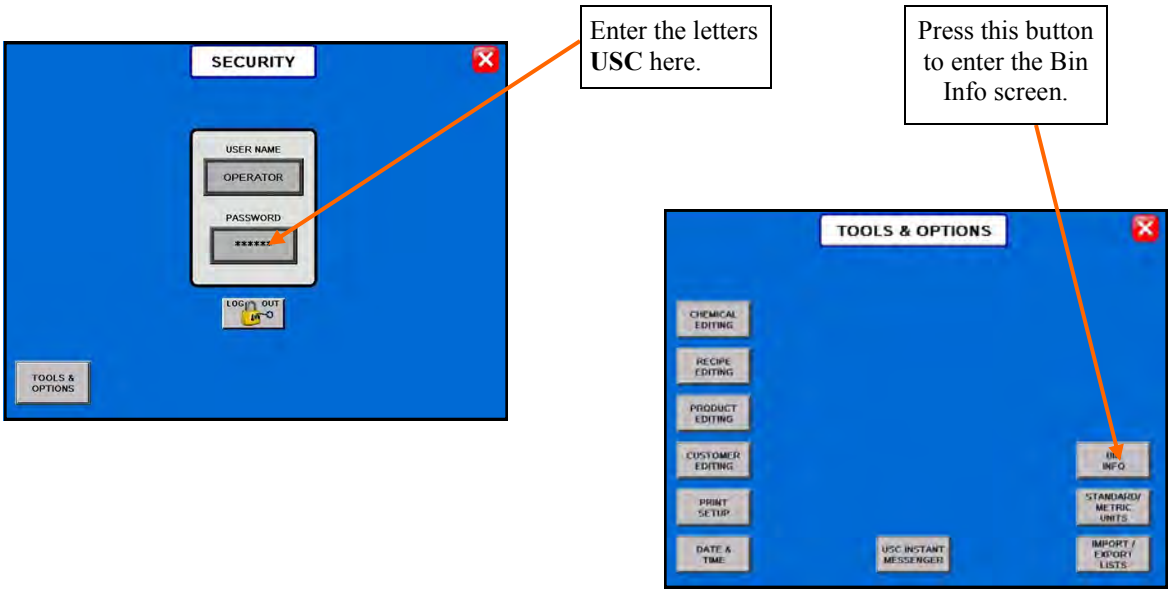
SECTION D-4 TRI-FLO® CALIBRATION & OPERATION

LOADING SEED INTO BINS

Before seed is pulled out of the bins and run through the Tri - Flo ® System, all the applicable information about the seed that was loaded into each individual bin must first be entered into the Tri - Flo ® System. If the same seed was loaded into multiple bins the same information still needs to be loaded into each bin separately.

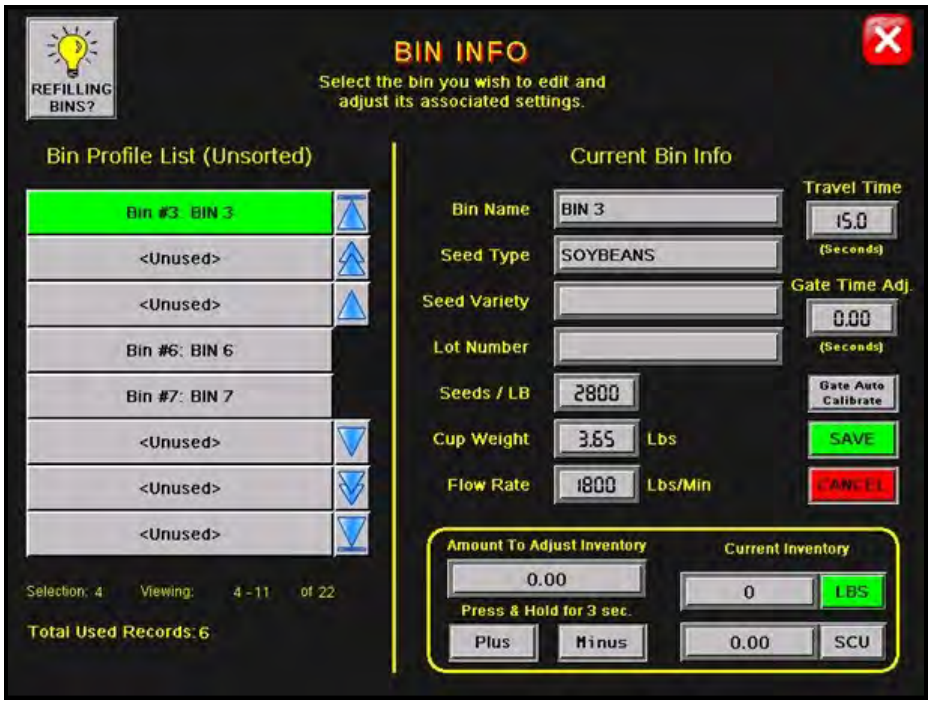
The following is a list of steps to perform to enter the bin information for each bin once seed has been loaded into that bin:

1. Load the seed into the bin. Take a seed sample for the cup weight of each bin at this time. Also, note the seed type, seed variety, lot number, seed weight and total inventory weight of the seed that is loaded into the bin. The seed weight can be defined in either pounds, seed count units or seed weight units.
2. Press the UTILITIES button in the lower left corner of the Bin Site main screen.
3. Press the SECURITY button on the bottom of the Utilities screen.
4. Press the PASSWORD box, then from the popup keyboard enter the letters USC and press enter.
5. Press the TOOLS & OPTIONS button in the lower left hand corner of the Security screen.
6. Press the BIN INFO button on the Tools & Options screen.



LOADING SEED INTO BINS

7. Select the desired bin to enter information into from the select bin list..
8. Enter the seed type, seed variety, lot number, seeds per pound and cup weight of the seed in the bin into their respective box under the Current Bin Info.
9. Enter in the total weight of seed that was added to the bin into the bin inventory section on the lower portion of the screen. The system will automatically subtract inventory after each run. Press the save button when all the information has been entered.
10. When finished, exit back to the Main screen.



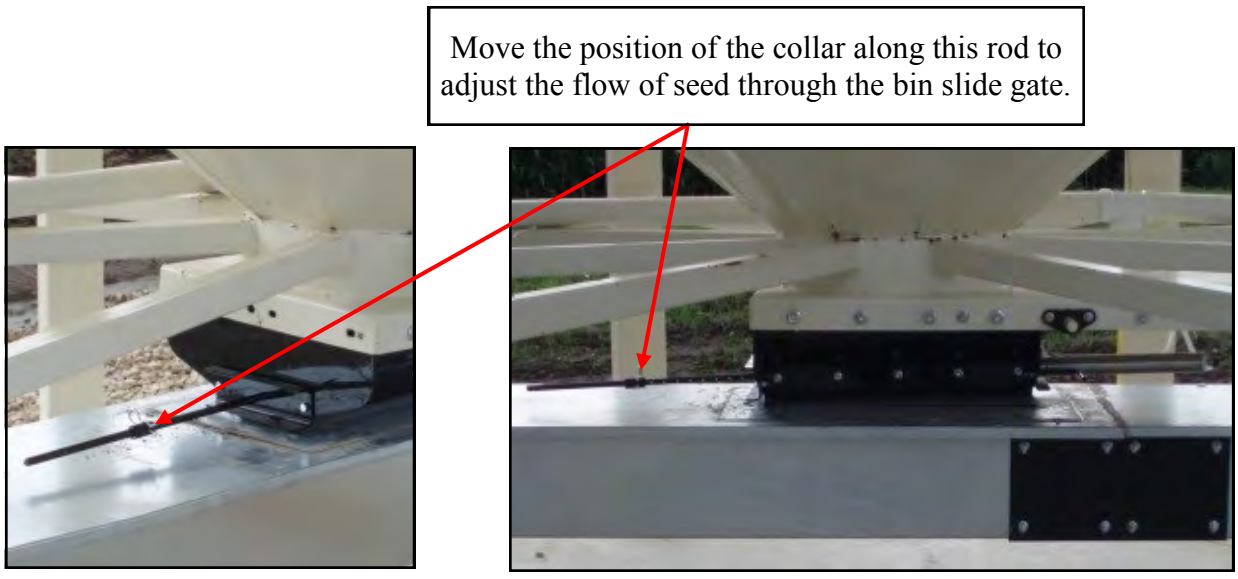
SETTING THE SEED FLOW RATE

The following is a list of steps for setting the seed flow rate. This must be completed before running the Tri - Flo ® system. Repeat steps 1 & 2 for each bin.

1. Set the manual gate on the bin to the fully open position. Once opened, this gate should be set in place and not moved through out the entire season. If this gate is adjusted during a run or between runs then it will effect the calibration of the system and the system will need to be re-calibrated. (page 91)
2. Set the stop for the air actuated slide gate on the bin. This stop controls how far the slide gate will open and the flow rate at which seed can exit the bin. To set the stop, adjust the position of the collar on the rod that exits the slide gate opposite of the air valve (below). Placing the collar closer to the slide gate will restrict flow and farther away from the slide gate will increase seed flow for the system. Once a collar location has been selected, use the hitch pin to lock the collar in place. If the stop is adjusted between runs then it will effect the calibration of the system and the system will need to be re-calibrated. (page 91)

NOTICE It is recommended to initially place the collar closer to the slide gate and then move it farther away from the slide gate one hole at a time to increase the flow rate of the system. This will protect against overloading the underbin conveyor with seed.

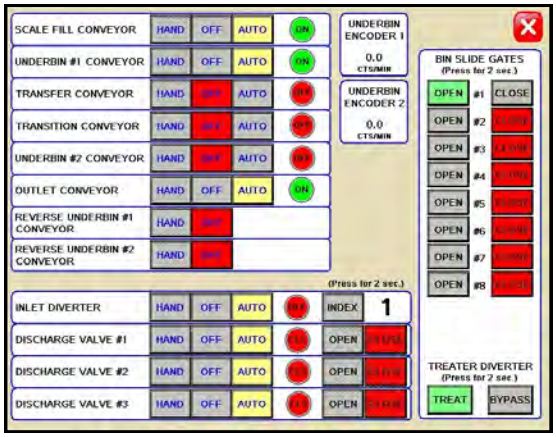
Note: A minimum of 2000 pounds is recommended but not nessacarily needed to calibrate flow rate for the first time. The system needs roughly that amount to enter it's real time calibration (depending on the distance of the bin, it may be far less) but at the end of any alarm/pause free run of seed the system will do a calibration. If the run is long enough, then no initial calibration is needed as the system will set it's calibration during the run. If running a small batch there may not be enough seed run to have the flow rate updating in real time during the run. As long as there have been no pauses or alarms the system will re-calculate and update the flow rate display after the run is complete.

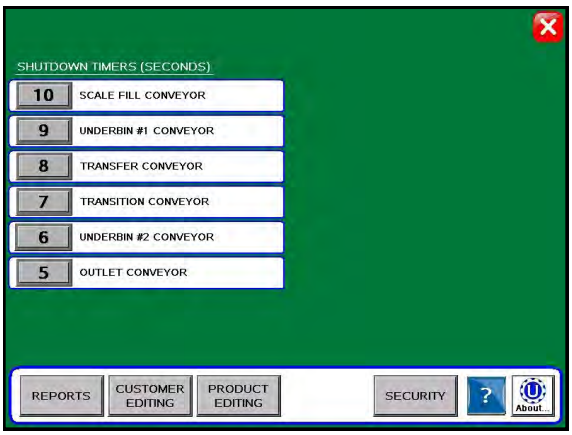


SCALE FILL FROM BIN

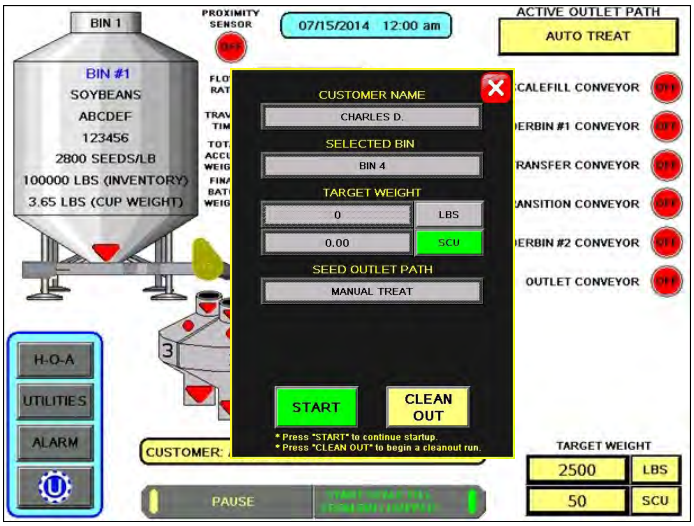
The following is a list of steps to use when running the Tri - Flo ® system in the Scale Fill From Bin mode of operation. This allows the operator to automatically fill the scale from the bin.

1. Under the H-O-A screen place all necessary conveyors into the AUTO mode of operation. (below left) Ensure that the diverter is in the appropriate position as well.
2. Under the Utilities screen, ensure that all settings are appropriate. (below right)



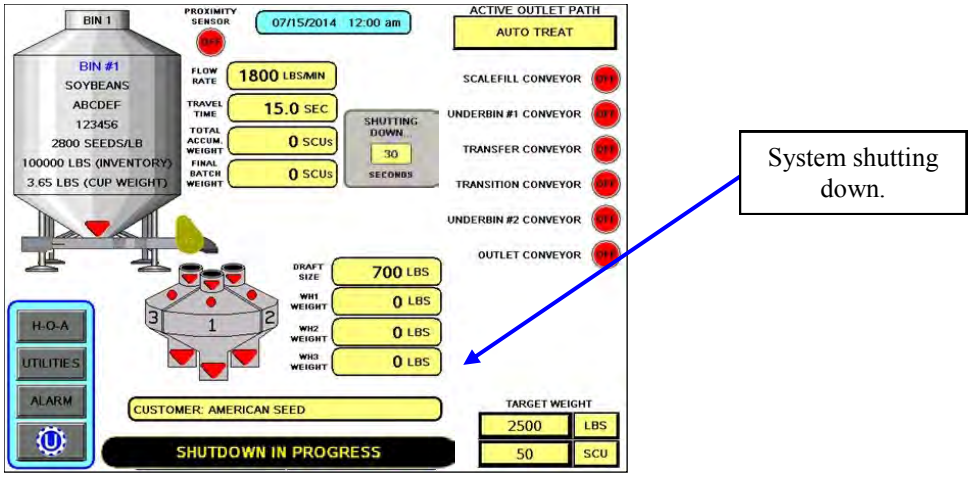


3. Select the bin that you wish to call seed from by pressing the START SCALE FILL FROM BIN/HOPPER button on the Main screen and press the gray button under selected bin then select the bin from the pop-up window.
4. Next press the seed outlet path button and then select either AUTO TREAT or MANUAL TREAT mode of operation depending upon what you plan to do with the seed once it has been pulled from the bin and weighed by the batch hopper system. There may be other names set for different outlet paths an operator may see based on different configuration settings.
5. In the box labeled TARGET WEIGHT enter the amount of weight that is to be brought into the Tri - Flo ® on this run.
6. Press the box labeled CUSTOMER at the top of the startup wizard and enter in the current customer's name in the search box or scroll through the list with the navigation buttons.



SCALE FILL FROM BIN

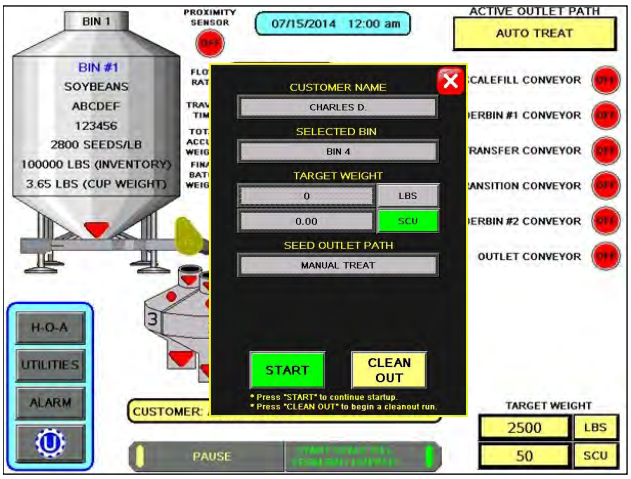
7. Press the START button at the bottom of the startup wizard screen. This toggles the button to CANCEL SCALE FILL FROM BIN and activates the PAUSE button. The system will first turn on the scale fill conveyor and then the underbin conveyor. Once all needed conveyors are running, the slide gate for the selected bin will open and seed will flow through the conveyors to the Tri - Flo ® hoppers.
8. As the Tri - Flo ® system is running, the main screen will display the total pounds of seed in each of the three weight hoppers, and the status of the conveyor motors.
9. The slide gate on the bin will automatically close once the target weight in seed passes through the slide gate. Once the gate closes, a window will appear notifying the operator that the batch is finishing. It will then be replaced with another window indicating amount of time before the system shuts down. If operating in the Manual Treat mode the treater will have to be turned on and off separately. The system will then shutdown the conveyors in reverse order of startup. This will ensure the conveyors have an opportunity to clean out any product from them. (bottom)



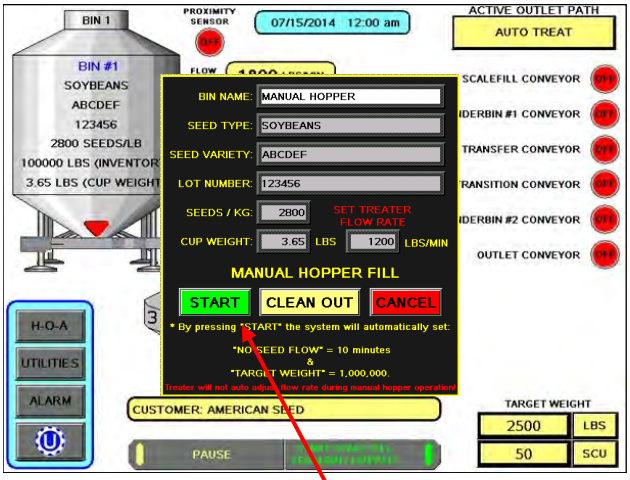
CALLING IN SEED FROM PRO BOXES

The following is a list of steps to use when running the Tri - Flo ® system using the START SCALE FILL FROM HOPPER button. This button will automatically move seed from the manual hopper, via the transfer conveyor, to the scale.
The START SCALE FILL FROM HOPPER button is only available if the Tri - Flo ® system has a manual hopper.

1. Under the H-O-A screen place all necessary conveyors into the AUTO mode of operation. Depending upon the setup of the equipment, some bin sites will require only the transfer conveyor or the scale fill conveyor to be in AUTO mode and some sites will require the transfer, underbin and scale fill conveyors to all be in the AUTO mode. Ensure that the diverter is in the appropriate position as well.
2. Under the Utilities screen, ensure that all settings are appropriate.
3. Press the START SCALE FILL FROM BIN/HOPPER button and under Bin Select button choose MANUAL HOPPER.
4. Press the Seed Outlet Path button then select either AUTO TREAT or MANUAL TREAT mode of operation depending upon what you plan to do with the seed once it has been pulled from the Pro Box and weighed by the Tri - Flo ® system. There may be other names set for different outlet paths an operator may see based on different configuration settings.



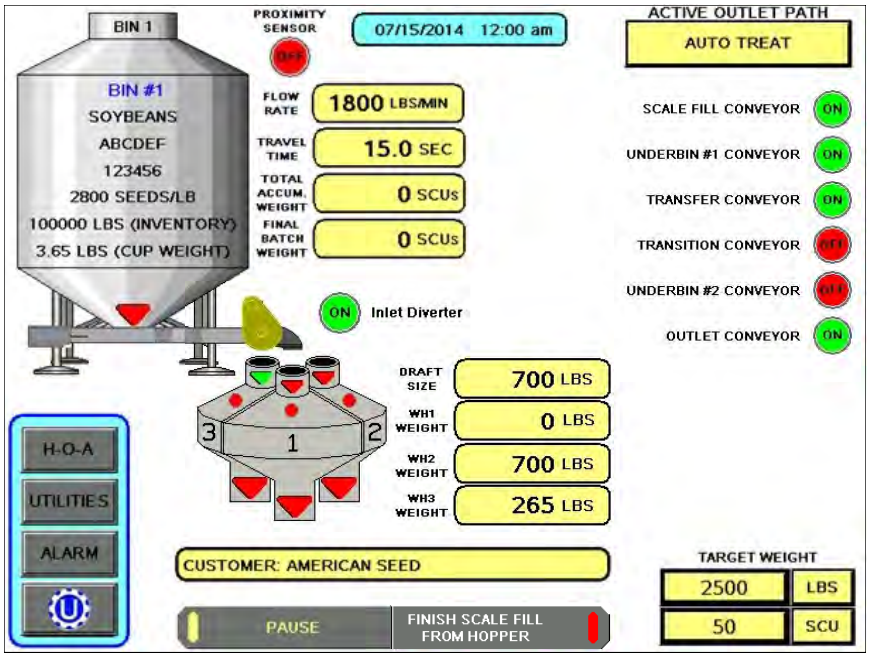
5. Press START button at the bottom of the startup wizard screen. Once all seed information is correct press START. This toggles the button to FINISH SCALE FILL FROM HOPPER and activates the PAUSE button. The system will first turn on the scale fill conveyor, the underbin conveyor, then the transfer conveyor (If applicable) and the outlet conveyor (If applicable).



Start

CALLING IN SEED FROM PRO BOXES

6. As the Tri - Flo ® system is running, the Main screen will display the total pounds of seed in each of the three Tri - Flo ® weigh hoppers. If the system needs to be stopped for a moment because of a problem, the PAUSE button can be pressed to halt the process. When ready to begin again, the CONTINUE button is pressed.
7. Once all of the seed has passed from the manual hopper, through the conveyors and through the weigh hoppers, press the FINISH SCALE FILL FROM HOPPER button. At this point, the conveyors will shutdown in reverse order of startup.
8. The system will automatically print the report for the run from the scale head printer.



TRI - FLO ® CALIBRATION

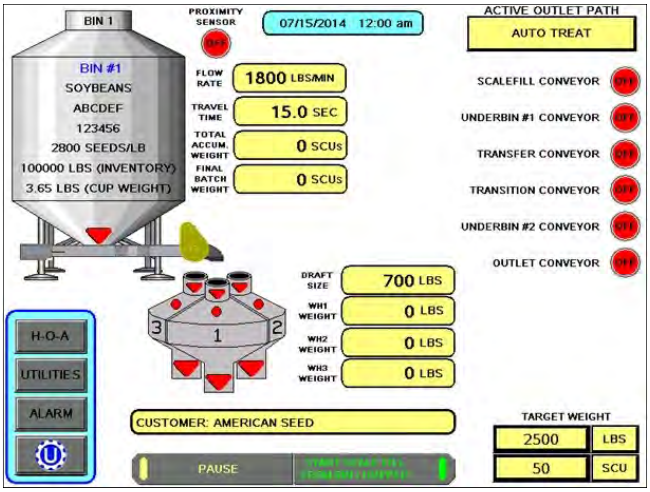
Once the initial calibration is established, the system continuously updates the seed flow rate. The calibration is based upon time and weight. The system first calculates the amount of time it takes for the seed to travel from the bin slide gate to the first Tri - Flo ® weigh hopper. This is called the travel time. Then the system calculates how long it takes to fill the first weigh hopper. This allows the system to calculate the seed flow rate of pounds per minute. Finally, the system uses the travel time and seed flow rate to calculate the amount of seed in the conveyors at any given time. Once this weight is known, it will automatically close the bin gate at the appropriate time to reach the target weight of seed that the operator has entered.

Initial calibration procedure:

1. Set the bin collar in the fourth hole from the end of the rod in. This sets the Flow Rate at approximately 1200 pounds. Adjust as needed (each hole adjusts up or down by approximately 200 pounds). These figures are based on Soybeans.

2. From the main screen check the Flow Rate to verify it is at the default setting of 1800 lbs/min and the Travel Time is at it's default of 15.0 sec. Then set your Target Weight at 2000 pounds. At the end of the run the Final Batch Weight must be 1500 pounds. These values are recommended but not necessary depending on the setup. For the system to be able to record the calibration the first two Tri - Flo ® hoppers must be weighed full and the third is in the process of filling with no alarm faults. After the run, check to see if the Flow Rate and Travel Time have changed from the default settings. If they have the system has been successfully calibrated. Each bin must be individually calibrated. If running a small batch there may not be enough seed run to have the flow rate updating in real time during the run. As long as there have been no pauses or alarms the system will re-calculate and update the flow rate display after the run is complete.

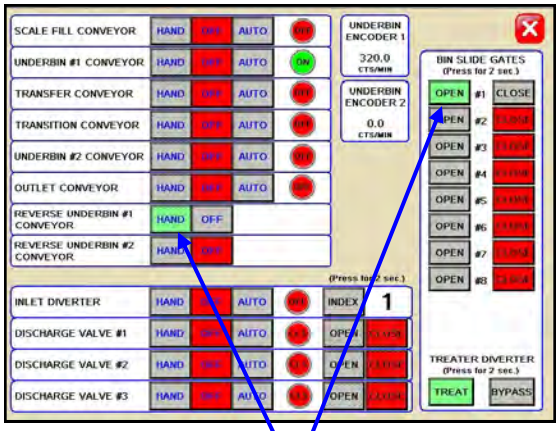
NOTE: If you change the location of the bin collar or the bin runs out of seed before the Target Weight is reached the system will need to be re-calibrated.



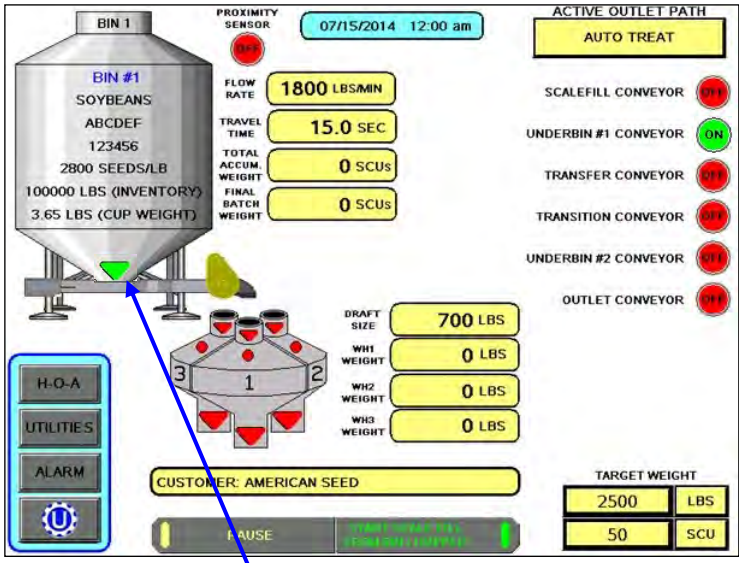
UNDERBIN OPERATION IN REVERSE MODE

The following is a list of steps to use when running the Tri - Flo ® system using the Reverse mode. This mode of operation will allow the operator to clean out the underbin conveyor and to remove any excess seed from the bins at the end of the treating season. **ALWAYS ENSURE THE BELT IS IMMEDIATELY AND PROPERLY ALIGNED WHEN RUNNING IN REVERSE! BELTS WILL OFTEN SHIFT ALIGNMENT WHEN THEIR DIRECTION OF TRAVEL IS REVERSED.** The REVERSE UNDERBIN CONVEYOR for the underbin conveyor will only be present if the Tri - Flo ® system has the reversing option for the underbin conveyor.

1. Place a conveyor and seed storage container under the reversing end of the underbin conveyor to catch seed as it exits the underbin conveyor. Turn that conveyor motor on.
2. Under the H-O-A screen place the REVERSE UNDERBIN CONVEYOR operation in the HAND mode. (top) Ensure that the belt on the underbin conveyor is correctly aligned.
3. Then, manually place the desired bin slide gate to the OPEN position. (top)
4. The Tri - Flo ® Main Screen will show the underbin conveyor on and the bin slide gate in the open position. (bottom)
5. Once all seed has passed through the underbin conveyor and into the seed container, place the open bin slide gate back to the CLOSED position.
6. Allow the underbin conveyor to run for at least 15 seconds. This will allow the underbin conveyor to clean itself out. Then place the underbin conveyor motor back to the OFF position.



Press the "HAND" button and then place the bin slide gate to the "OPEN" position.



Slide Gate Indicator.

TROUBLESHOOTING & ALARMS

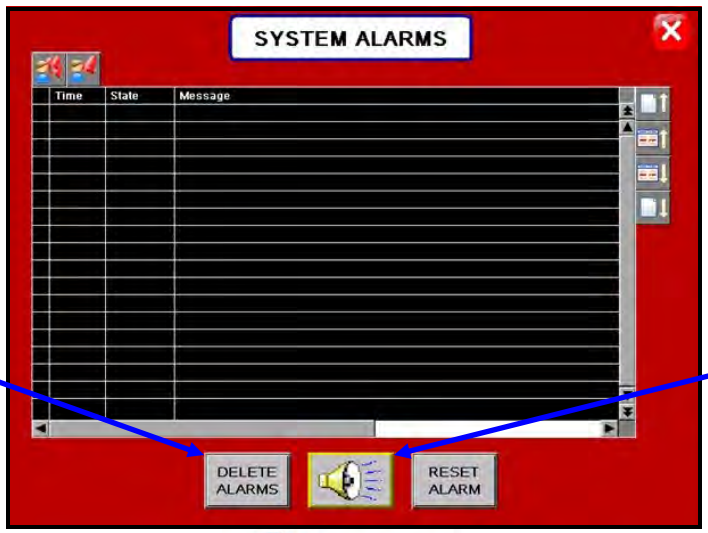
SECTION E

TROUBLESHOOTING

This section contains tables describing the most frequent problems and solutions with the USC systems on the pages noted below. For further assistance, contact the USC Service department at (785) 431-7900.

SYSTEM ALARMS - FAULTS

The table on the pages noted below provide a general description of all the system alarms (faults & warnings) of the different USC systems. When a fault or warning condition is detected by the system, the alarms screen will pop-up describing the cause of the alarm or fault. Any motor fault will activate the alarm screen on the operator control panel. If running, the system will then progress to the pause state. A warning will alert the operator of a system condition which needs attention or correction. The alarms are reset when the fault condition is cleared and the “Reset Alarm” button is pressed. The horn is silenced by pressing the “Silence Alarm” button on the alarm screen. For further assistance, contact the USC Service department at (785) 431-7900.



SECTION E-1 TREATER TROUBLESHOOTING

TROUBLESHOOTING

Below is a table describing the most frequent problems and solutions with the USC LPX Automated Seed Treater. For further assistance, contact USC at (785) 431-7900.

Problem	Possible Cause	Solution
Inlet Conveyor will not turn on.	1. Inlet Conveyor proximity switch is activated. 2. Inlet Conveyor proximity switch is too sensitive. 3. Conveyor is plugged into wrong outlet on seed treater panel.	1. Clean proximity switch. 2. Adjust the Inlet Conveyor proximity switch sensitivity by turning the adjustment screw counter-clockwise (page 96). 3. Check to make sure the Inlet Conveyor is plugged into the inlet conveyor receptacle.
Pump will not turn off in “AUTO” when seed runs out.	1. Proximity switch is dirty. 2. Proximity switch is set too sensitive.	1. Clean proximity switch. 2. Adjust the pump proximity switch sensitivity by turning adjustment screw counter-clockwise (page 96).
Pump will not turn on in “AUTO”.	1. Proximity switch is not staying covered. 2. Proximity switch is not sensitive enough.	1. Make sure proximity switch is staying covered with seed. 2. Adjust pump proximity switch sensitivity by turning the adjustment screw clockwise (page 96).
Inlet conveyor won’t shut off when supply hopper is full.	1. Seed is not hitting proximity switch. 2. Proximity switch is not set sensitive enough. 3. Inlet Conveyor is plugged into wrong receptacle.	1. Make sure seed is hitting proximity switch. 2. Adjust the inlet conveyor proximity switch by turning the adjustment screw clockwise (page 96). 3. Make sure Inlet Conveyor is plugged inlet conveyor receptacle.
Shutdown due to not having all needed devices available.	1. An interlock on one of the bin site conveyors is not properly setup and is keeping the conveyor from starting. 2. The system was “paused” during startup.	1. Contact USC service department for assistance with changing the interlock. 2. Restart the run of seed.

Problem	Possible Cause	Solution
Pump is fluctuating.	1. Restriction in tubing 2. Filter is plugged or missing gasket.	1. Flush tubing and check filter for any restrictions. 2. Clean filter and check for gasket.
Seed calibration is fluctuating.	1. Seed treater supply hopper is not staying full. 2. Restriction in the supply hopper or seed wheel. 3. Build-up in the atomizing chamber.	1. Make sure the supply hopper and seed wheel are staying full. May have to lower seed flow rate in order to have a consistent flow of seed. 2. Check supply hopper and seed wheel for any debris, and remove. 3. Remove atomizing housing and clean out any build-up of material.
Drum is slipping and seed is coming out the inlet side of the drum.	1. Drum is wet. 2. The seed treater is set too level. 3. Chains are too loose.	1. Dry off any moisture that may have collected on the outside of the drum. 2. Adjust the slope of the seed treater to at least a 3" drop from front to back. If desired, more slope can be applied. 3. Check and tighten the drive chains. Also check the chain alignment.
None of the motors will turn to "ON" in "HAND" mode.	1. Processor is faulted. 2. Emergency Stop button is activated.	1. Disconnect power and wait 30 seconds before reconnecting power. 2. Pull out the emergency stop button.
E-stop is flashing.	1. An E-stop may be depressed. 2. Power may not be on to the control panels. 3. One of the control panels may not be connected to all of the others.	1. Ensure all E-stops are not depressed. 2. Check incoming power to each control panel. 3. Check the wiring and connections to each control panel.

PROXIMITY SWITCH ADJUSTMENT GUIDE

The proximity switches mounted in the extension ring and the seed wheel detect when seed is present.

The proximity switch located in the extension ring is used to automatically shut off the inlet conveyor when the surge hopper is full. This proximity switch is not present on tower systems.

The proximity switches located in the seed wheel automatically shut off the pump when all seed has left the hopper.

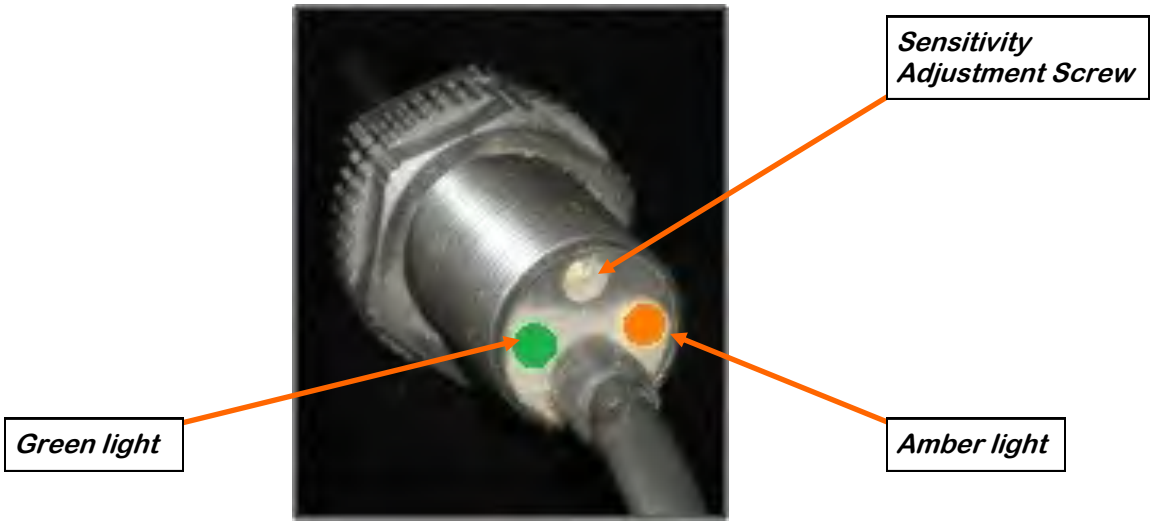
If the proximity switch is not working properly, this can be caused by wear, dust, or even moisture. The first step is to clean the lens of the proximity switch. If this does not solve the problem, the next step would be to adjust the sensitivity of the proximity switch.

The green light indicates the power status. If it is active the device is powered.

The amber light indicates when seed is being detected. If it is active it detects seed, if inactive it does not detect seed.

Using the small screwdriver provided inside the control panel, you can adjust the proximity switch by turning the adjusting screw on the back of the proximity switch.

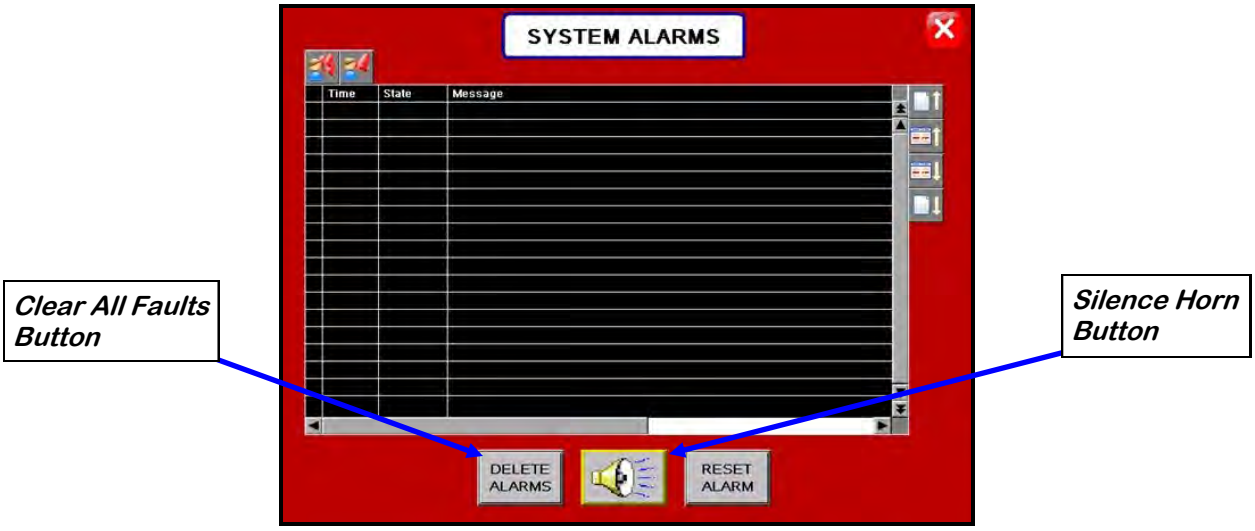
- Turn Clockwise to make the proximity switch more sensitive.
- Turn Counterclockwise to make the proximity switch less sensitive.



Proximity Switch Screwdriver

SYSTEM ALARMS - FAULTS

The table below and on the following pages provides a general description of all the system alarms (faults & warnings) of the LPX Automated Seed Treater. When a fault or warning condition is detected by the system, the alarms screen will pop-up describing the cause of the alarm or fault. Any motor fault will activate the alarm screen on the operator control panel. If running, the system will then progress to the pause state. A warning will alert the operator of a system condition which needs attention or correction. The alarms are reset when the fault condition is cleared and the "Reset Alarm" button is pressed. The horn is silenced by pressing the "Silence Alarm" button on the alarm screen. For further assistance, contact the USC Service department at (785) 431-7900.



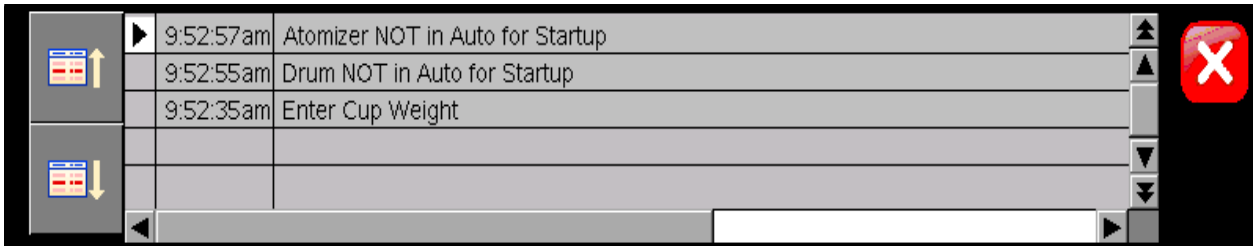
Alarm - Fault	Possible Cause	Solution
Drum Motor Fault	1. No signal from Drum motor drive (VFD) indicating that the Drum is running. 2. Drum motor has been shutdown while in Auto mode of operation.	1. Verify that the VFD is powered up, or check if it is faulted out. Check the Information screen. 2. Verify that the Drum was not turned "Off" while the system was in Auto mode of opera-tion.
Seed Wheel Motor Fault	1. No signal from Seed Wheel motor drive (VFD) indicating that the Seed Wheel is running. 2. Seed Wheel motor has been shutdown while in Auto mode of operation.	1. Verify that the VFD is powered up, or check if it is faulted out. Check the Information screen. 2. Verify that the Seed Wheel was not turned "Off" while the system was in Auto mode of operation.

Alarm - Fault	Possible Cause	Solution
Atomizer Motor Fault	1. No signal from Atomizer motor drive (VFD) indicating that the Atomizer is running. 2. Atomizer motor has been shutdown while in Auto mode of operation.	1. Verify that the VFD is powered up, or check if it is faulted out. 2. Verify that the Atomizer was not turned “Off” while the system was in Auto mode of operation.
Flow rate less than 300 or greater than 1800 lbs/min 136-820 KGS/min	1. There could be an obstruction in the seed path. 2. May have set run speed to high.	1. Check seed path for obstruction and remove it. 2. Slow run speed down.
Treater Inlet Conveyor Motor Fault	1. Inlet Conveyor motor auxiliary contact was not sensed after being energized to run.	1. Verify that the motor starter has power and is turned on.
Treater Outlet Conveyor Motor Fault	1. Outlet Conveyor motor auxiliary contact was not sensed after being energized to run.	1. Verify that the motor started has power and is turned on.
Pump - Not In Process:	1. Valve of the liquid displayed failed to divert to process when requested.	1. Verify valve has diverted, if so troubleshoot sensor, if not check air supply and signal to valve.
Seed Wheel - Lbs/Min Under Range	1. Actual Lbs/Min is under 95% of target rate.	1. Make sure the VFD is not maxed out at the specified target rate. Check for sluggish or oscillating Seed Wheel response. Call the manufacturer.
Check Operation Of Seed Sensors In Seed Wheel	1. Seed Wheel is in Auto mode of operation, and only one proximity sensor has been activated for the past ten seconds.	1. Verify both proximity sensors are working properly. (This alarm will also be activated if seed is only flowing through one side of the seed wheel.)
Treater Pump # Liquid Flow Rate Alarm: Flow is more than ## percent out of range for X seconds.	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.

Alarm - Fault	Possible Cause	Solution
Treater Pump # Liquid Flow Rate Alarm: Flow is more than xxx out of range for X seconds.	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.
Pump ## Three Way Valve Not In Process Alarm	1. Valve of the liquid displayed failed to divert to process when requested.	1. Verify valve has diverted, if so troubleshoot sensor, if not check air supply and signal to valve.
Treater Surge Suppressor - L1 FAILED!!!	1. L1 of the Surge Protector will no longer protect the electrical panel against voltage surges.	1. Replace the Surge Protector.
Check pump flow rate - Must be above 80% Target Rate for 30 seconds	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.
Check pump flow rate - Less than 10oz/min below Target Rate for 10 seconds	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.
Check pump flow rate - Less than 50% Flow Rate for 5 seconds	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.
Check pump flow rate - Less than 80% Flow Rate for 10 seconds	1. Filter may be clogged. 2. Hoses may be obstructed. 3. Pump Head not locked down. 4. Pump Head hoses may be worn out.	1. Remove filter and clean. 2. Check to see if hoses are blocked or pinched. May need to clean or replace. 3. Lock down Pump Head. 4. Replace Pump Head hoses.
Mix Tank ## Motor Fault	1. Mix Tank motor auxiliary contact was not sensed after being energized to run.	1. Verify that the motor starter has power and is turned on.

SYSTEM MESSAGES

The table below provides a general description of some of the system messages that could occur. When a warning condition is detected, a window will appear (below) notifying the operator that the system will not start because of a certain condition. When the condition has been corrected, the START button can be pressed to start the system.



Message
Atomizer NOT in Auto or Ready for Startup
Drum Not In Auto or Ready For Startup
Treater outlet conveyor is not in auto.
Automatic seed flow rate adjustment has occurred. Seed flow rate was out of range.
Pumps 5-8: Ethernet Communication Failure
Pumps 9-12: Ethernet Communication Failure
Reports are nearly full. Please, save reports to USB and then delete reports.
Reports are full. Information loss may occur!
Seed wheel not in auto or ready for startup.
Bin site shutdown due to not having all needed devices available for operation. Contact USC Service Rep for assistance.
Treater seed flow rate is set higher than the calculated bin site seed flow rate.
Enter Cup Weight
No Product Selected
Auto Startup - No Seed Type match
Treater Reports - FULL. Transfer reports to USB to keep from losing data.
Treater Reports - almost FULL. Transfer reports to USB."
Conveyor # is not in auto.
Operation not selected.

BATCH HOPPER TROUBLESHOOTING

SECTION E-2

TROUBLESHOOTING

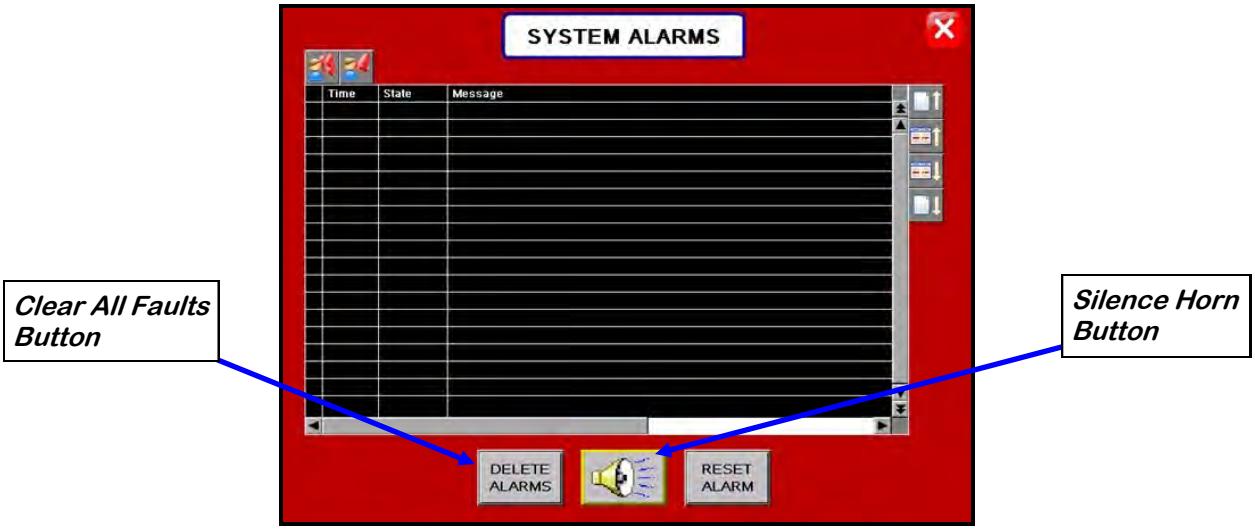
Below is a table describing the most frequent problems and solutions with the USC Batch Weigh Hopper system. For further assistance, contact USC at (785) 431-7900.

Problem	Possible cause	Solution
System is not consistently calibrating correctly.	1. Bin slides gates or manual gates have been moved. 2. Underbin conveyor belt is slipping. 3. Bin slide gate is not consistently opening to the same point. 4. The operator is pressing the CANCEL SCALE FILL button before the run ends. 5. System is being paused during the run.	1. Ensure that the slide gate collar and manual gate is locked into place. Then recalibrate. 2. Tighten the underbin conveyor belt. 3. Check for any obstruction that may be restricting the movement of the slide gate. 4. Allow the system to shutdown on its own. 5. Make another run without pausing system.
System calibration for currently selected bin is incorrect.	1. System is too far out of calibration to recalibrate automatically.	1. Recalibrate the system. (see page 82)
Weight display not reading steady (Bouncing)	1. Bad load cell. 2. Wind Drafts. 3. Poor grounding.	1. Replace load cell. 2. Close doors. 3. Check grounding and ensure that it meets all area codes.
No scale reading on the weigh hopper indicator on the touch screen.	1. Ethernet cable is disconnected. 2. Scale head is unplugged.	1. Check all Ethernet cables for connectivity and damage. 2. Ensure that the scale head has power and is turned on.
Scale is reading incorrect weight.	1. Something is touching the scale. 2. Scale needs recalibrated. 3. Ethernet cable may be damaged or receiving electrical interference	1. Ensure that the area around the scale is clean and that nothing is leaning on or resting on the hopper. 2. Zero scale. If still incorrect, have a professional scale technician recalibrate the scale. 3. Ensure that Ethernet cable is not located directly next to any electrical lines.

Problem	Possible Cause	Solution
No bin slide gates will open or close when their corresponding button is pressed on the touch screen.	1. No air or not enough air is being supplied to the solenoid bank on the side of the bin site control panel. 2. The bin site panel may be off. 3. Power surge has disrupted electrical communications.	1. Ensure that at least 100 psi of air is being supplied to the solenoid bank. 2. Ensure that the bin site control panel has power to it, is on and that all of the breakers inside the panel are on as well. 3. Power off all panels for 30 seconds then power them back on.
Air gate will not close fully.	1. Something is obstructing the air gate from closing. 2. Air pressure to the gate is not strong enough.	1. Remove obstruction. 2. Ensure that the bin slide gate has at least 100 psi of air being supplied to it.
Air gate is opening when it should be closing and vice versa.	1. Air lines to the air gate are reversed.	1. Exchange air line for the proper solenoid on the back of the solenoid bank.
Diverter is leaking seed through bypass side while in TREAT mode of operation.	1. Too low of air pressure to actuate the diverter. 2. An obstruction in the diverter is stopping correct placement of the diverter plate.	1. Ensure that at least 100 psi of air pressure is present at the diverter. 2. Remove obstruction.
Solenoids are making a buzzing sound when air gates are actuated.	1. Moisture in the air system. 2. Electric actuator on solenoid bank may be faulty.	1. Remove moisture from the air lines. 2. Replace the electronic actuator on the solenoid.
The touch screen has warning triangles on each button.	1. The bin site PLC may be off.	1. Ensure that the bin site control panel has power to it, is ON and that all of the breakers inside the panel are on as well.
Conveyor will not start in HAND or AUTO mode.	1. Conveyor motor starter is tripped. 2. Conveyor is clogged.	1. Reset motor starter. 2. Remove obstruction or debris.

SYSTEM ALARMS - FAULTS

The table below and on the following pages provides a general description of all the system alarms (faults & warnings) of the Batch Weigh Hopper system. When a fault or warning condition is detected by the system, the Alarms screen will pop-up describing the cause of the Alarm or Fault. Any motor fault will activate the alarm screen on the operator control panel. If running, the system will then progress to the Pause state. A warning will alert the operator of a system condition which needs attention or correction. The alarms are reset when the fault condition is cleared and the Reset Alarm button is pressed. The horn is silenced by pressing the Silence Alarm button on the Alarms screen. For further assistance, contact USC at (785) 431-7900.

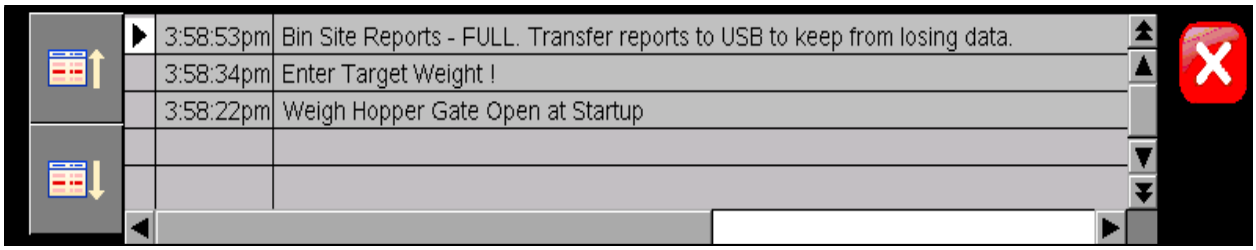


Alarm - Fault	Possible Cause	Solution
Weigh Hopper over Max weight	1. The current weight in the Weigh Hopper is above the number entered into the maximum scale weight in the Utilities screen.	1. Verify the number entered into the maximum scale weight box is correct. If yes, then re-calibrate and rerun system.
Bin Site SURGE SUPRESSOR-FAILED!!!	1. L1 of the Surge protector will no longer protect the electrical panel against voltage surges.	1. Replace the Surge Protector.
Conv # Belt/Encoder Fault	1. Conveyor belt is slipping. 2. Conveyor Speed encoder is not working correctly.	1. Tighten and adjust the Conveyor belt as necessary. 2. Verify that sensor is tight to shaft and wiring is correct. If yes to both, then replace sensor.

Alarm - Fault	Possible Cause	Solution
Conveyor #1 Motor Fault	1. Conveyor #1 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #1motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #1 was not turned OFF while the system was in Auto mode of operation.
Conveyor #2 Motor Fault	1. Conveyor #2 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #2 motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #2 was not turned OFF while the system was in Auto mode of operation.
Conveyor #3 Motor Fault	1. Conveyor #3 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #3 motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #3 was not turned OFF while the system was in Auto mode of operation.
Conveyor #4 Motor Fault	1. Conveyor #4 motor auxiliary contact was not sensed after being energized to run.	1. Verify that the motor starter has power and is turned on.
Weigh Hopper Discharge Gate Fault	1. OPEN/CLOSE slide gate sensor is not positioned properly. 2. OPEN/CLOSE slide gate solenoid failed to actuate.	1. Verify that the OPEN/CLOSE slide gate sensor is properly positioned. 2. Check air supply and signal to solenoid.
Bin Site Batch Overweight Alarm	1. Hopper received more weight than called. 2. Hopper scale calibration is off.	1. Recalibrate scale with new run.

SYSTEM MESSAGES

The table below provides a general description of all the system messages that could occur. When a warning condition is detected, a window will appear (below) notifying the operator that the system will not start because of a certain condition. When the condition has been corrected, the START SCALE FILL FROM BIN button can be pressed to start the system.



Message
Target weight too small.
Scale communications errors
Target weight larger than max hopper weight.
Weight hopper discharge valve not in auto.
Weigh hopper gate open at startup

SECTION E-3 TRI - FLO ® TROUBLESHOOTING

TROUBLESHOOTING

Below is a table describing the most frequent problems and solutions with the USC Tri - Flo ® bin site system. For further assistance, contact USC at (785) 431-7900.

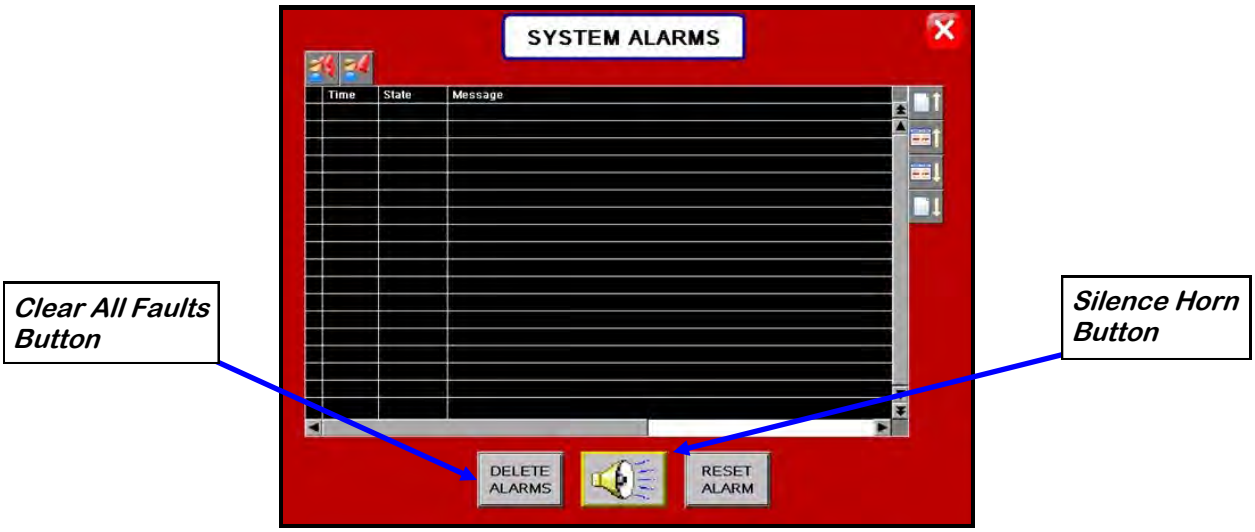
Problem	Possible cause	Solution
Tri - Flo ® : Minimum flow rate alarm.	1. Running too low capacity.	1. Adjust your air gates or manual gates.
Tri - Flo ® : Indicator weight shows two pounds in bin after run.	1. Tri - Flo ® did not empty completely.	1. Open gates on the Tri - Flo ® and zero scales.
Tri - Flo ® : Scale will not zero out.	1. Scale is in filing mode. 2. Scale is to far out of range.	1. Exit filling mode then end run. Needs to be in shipping mode. 2. Recalibrate scale
Tri - Flo ® : Even when all three scales are zeroed on Batch, the next batch gives a negative number on one of the hoppers with an overweight Alarm.	1. Tri - Flo ® was not emptied before zeroed. 2. Wind drafts. 3. Hoppers are touching.	1. Open gates and zero scale. 2. Close doors. 3. Loosen the four mounting bolts enough to be able to move the hopper. Make the gap on both sides of the hopper as even as possible.
Tri - Flo ® : If there are five pounds or less in the hopper, the system will not empty hopper.	1. Scale heel weight has not been reached.	1. Open and close the gate hopper.
System is not consistently calibrating correctly.	1. Bin slides gates or manual gates have been moved. 2. Underbin conveyor belt is slipping. 3. Bin slide gate is not consistently opening to the same point. 4. The operator is pressing the “Cancel Scale Fill” button before the run ends. 5. System is being paused during the run.	1. Ensure that the slide gate collar and manual gate is locked into place. Then recalibrate. 2. Tighten the underbin conveyor belt. 3. Check for any obstruction that may be restricting the movement of the slide gate. 4. Allow the system to shutdown on its own. 5. Make another run without pausing system.

Problem	Possible Cause	Solution
System calibration for currently selected bin is incorrect.	1. System is too far out of calibration to recalibrate automatically.	1. Recalibrate the system. (see page 91)
Weight display not reading steady (Bouncing)	1. Wind drafts. 2. Bad load cell. 3. Poor grounding.	1. Close doors. 2. Replace load cell. 3. Check grounding and ensure that it meets all area codes.
Scale is reading incorrect weight.	1. Something is touching the scale. 2. Scale needs recalibrated.	1. Ensure that the area around the scale is clean and that nothing is leaning on or resting on the hopper. 2. Zero scale. If still incorrect, have a professional scale technician recalibrate the scale.
No Tri - Flo ® slide gates will open or close when their corresponding button is pressed on the touch screen.	1. No air or not enough air is being supplied to the air regulator / filter on the frame cross member. 2. The Tri - Flo ® PLC may be off.	1. Ensure that at least 100 psi of air is being supplied to the regulator and it is adjusted for a minimum output of 45 PSI. Also, check to see that the filter is clean and no water has built up above the maximum allowed line. 2. Ensure that the Tri - Flo ® control panel has power to it, is “on” and that all of the breakers inside the panel are “on” as well.
No bin slide gates will open or close when their corresponding button is pressed on the touch screen.	1. No air or not enough air is being supplied to the solenoid bank on the side of the bin site control panel. 2. The bin site PLC may be off.	1. Ensure that at least 100 psi of air is being supplied to the solenoid bank. 2. Ensure that the bin site control panel has power to it, is “on” and that all of the breakers inside the panel are “on” as well.
Air gate will not close fully.	1. Something is obstructing the air gate from closing. 2. Air pressure to the gate is not strong enough.	1. Remove obstruction. 2. Ensure that the bin slide gate has at least 100 psi of air being supplied to it. If it is a Tri - Flo ® slide gate it needs at least 45 PSI.
Air gate is opening when it should be closing and vice versa.	1. Air lines to the air gate are reversed.	1. Exchange air line for the proper solenoid on the back of the solenoid bank.

Problem	Possible Cause	Solution
Diverter is leaking seed through bypass side while in “treat” mode of operation.	1. Too low of air pressure to actuate the diverter. 2. An obstruction in the diverter is stopping correct placement of the diverter plate.	1. Ensure that at least 100 psi of air pressure is present at the diverter. 2. Remove obstruction.
Solenoids are making a buzzing sound when air gates are actuated.	1. Moisture in the air system. 2. Electric actuator on solenoid bank may be faulty.	1. Remove moisture from the air lines. 2. Replace the electronic actuator on the solenoid.
The touch screen has warning triangles on each button.	1. The bin site PLC may be off. 2. The Tri - Flo ® panel may be off.	1. Ensure that the bin site control panel has power to it, is “on” and that all of the breakers inside the panel are “on” as well. 2. Ensure that the Tri - Flo ® control panel has power to it, is “on” and that all of the breakers inside the panel are ON as well.
Conveyor will not start in HAND or AUTO mode.	1. Conveyor motor starter is tripped. 2. Conveyor is clogged.	1. Reset motor starter. 2. Remove obstruction or debris.

SYSTEM ALARMS - FAULTS

The table below and on the following pages provides a general description of all the system alarms (faults & warnings) of the Tri - Flo ® System. When a fault or warning condition is detected by the system, the Alarms screen will pop-up describing the cause of the Alarm or Fault. Any motor fault will activate the alarm screen on the operator control panel. If running, the system will then progress to the Pause state. A warning will alert the operator of a system condition which needs attention or correction. The alarms are reset when the fault condition is cleared and the RESET ALARM button is pressed. The horn is silenced by pressing the SILENCE ALARM button on the Alarms screen. For further assistance, contact USC at (785) 431-7900.

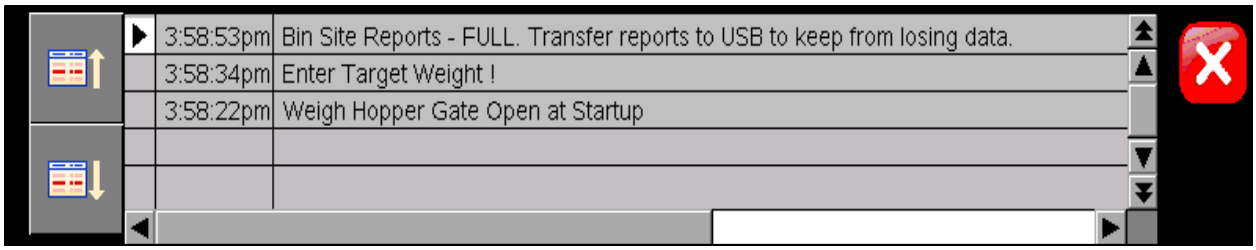


Alarm - Fault	Possible Cause	Solution
Tri-Flo inlet diverter limit switch 1 FAIL Tri-Flo inlet diverter limit switch 2 FAIL Tri-Flo inlet diverter limit switch 3 FAIL	1. Limit switch out of adjustment 2. Inverter did not fully rotate to the next hopper. 3. Limit switch failed.	1. Check adjustment on limit switch. 2. Manually rotate diverter to determine the problem. 3. Replace limit switch.
Tri-Flo WH1 discharge valve alarm Tri-Flo WH2 discharge valve alarm Tri-Flo WH3 discharge valve alarm	1. Air not on. 2. Limit switch out of adjustment.	1. Check to see if the main incoming air valve is open. 2. Adjust limit switch.

Alarm - Fault	Possible Cause	Solution
Tri-Flo WH1 high level Tri-Flo WH2 high level Tri-Flo WH3 high level	1. Weigh hopper is over full.	1. Empty hopper manually or move seed away from limit switch paddles by hand. 2. Run Cleanout.
Tri-Flo WH inlet diverter motor fault alarm	1. Motor over voltage tripped.	1. Reset overload.
Conveyor #1 Motor Fault	1. Conveyor #1 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #1motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #1 was not turned “Off” while the system was in Auto mode of operation.
Conveyor #2 Motor Fault	1. Conveyor #2 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #2 motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #2 was not turned “Off” while the system was in Auto mode of operation.
Conveyor #3 Motor Fault	1. Conveyor #3 motor auxiliary contact was not sensed after being energized to run. 2. Conveyor #3 motor has been shutdown while in Auto mode of operation.	1. Verify that the motor starter has power, is turned on and that the overload is not tripped. 2. Verify that the Conveyor #3 was not turned “Off” while the system was in Auto mode of operation.
Conveyor #4 Motor Fault	1. Conveyor #4 motor auxiliary contact was not sensed after being energized to run.	1. Verify that the motor starter has power and is turned on.
Tri-Flo surge supressor – FAILED!!!	1. L1 of the Surge protector will no longer protect the electrical panel against voltage surges.	1. Replace the Surge Protector.
Conv # Belt/Encoder Fault	1. Conveyor belt is slipping. 2. Conveyor Speed encoder is not working correctly.	1. Tighten and adjust the Conveyor belt as necessary. 2. Verify that sensor is tight to shaft and wiring is correct. If yes to both, then replace sensor.

SYSTEM MESSAGES

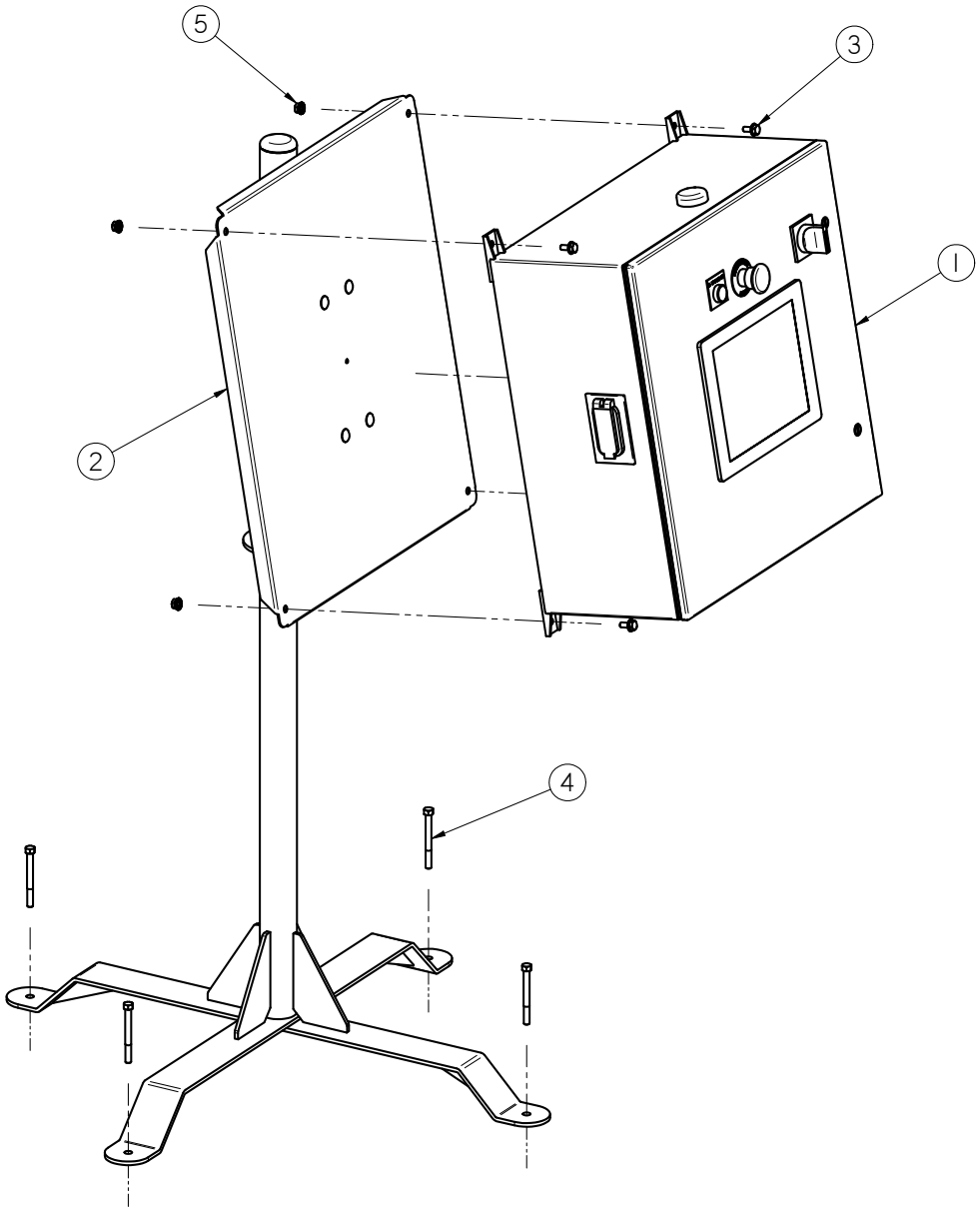
The table below provides a general description of all the system messages that could occur. When a warning condition is detected, a window will appear (below) notifying the operator that the system will not start because of a certain condition. When the condition has been corrected, the START SCALE FILL FROM BIN button can be pressed to start the system.



Message
Tri-Flo inlet diverter is not in auto
Tri-Flo WH 1 DCV is not in auto
Tri-Flo WH 2 DCV is not in auto
Tri-Flo WH 3 DCV is not in auto
Target weight too small
At least one of the Tri-flo scales is reading less than –5 LBS/KGS. Zero the scale(s)
Tri-Flo weigh hoppers are not empty, run clean out
Scale communications error
Bulk weigh ticket printer out of paper
Bulk weigh indicator not active. Check power and communication cables to the scale head & printer. Check printer paper.

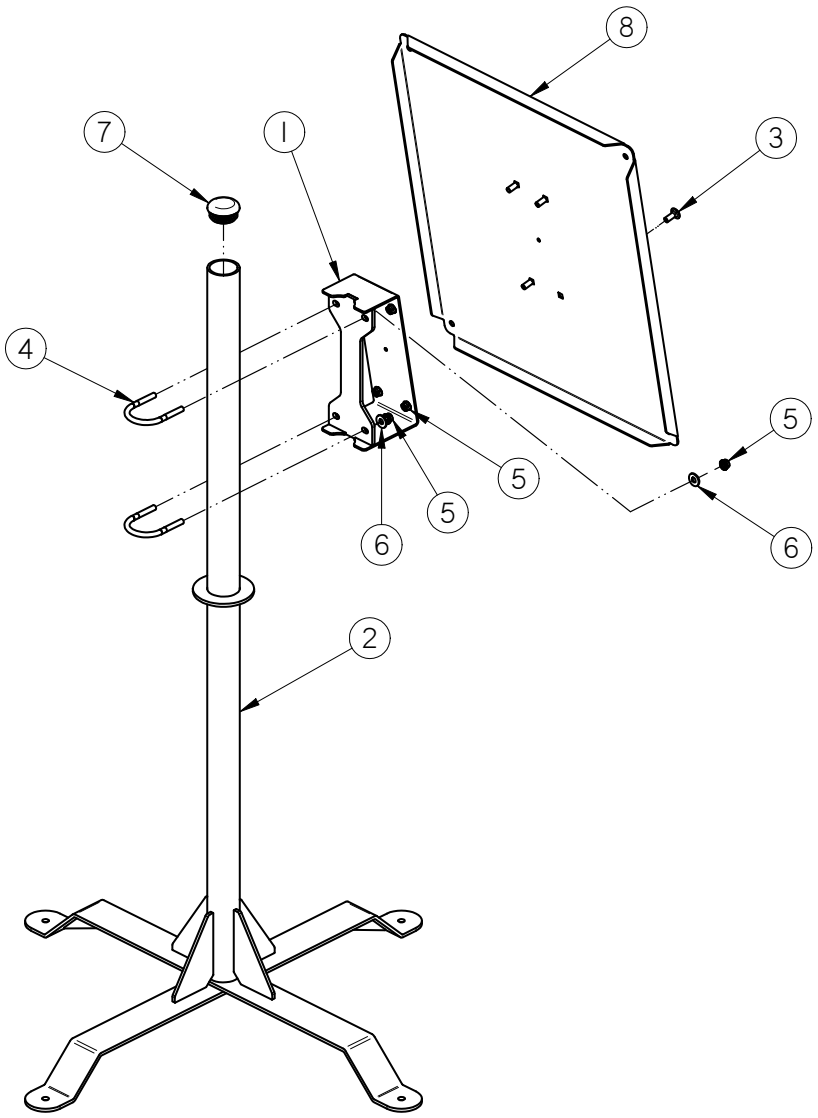
SECTION F MECHANICAL DRAWINGS

MAIN CONTROL PANEL ASSEMBLY (13-12-0118)



Item #	Part #	Description	Qty
1	03-12-0366	MAIN CONTROL PANEL U-TREAT	1
2	05-03-1471	ASSY PNL FRM 4PUMP SAP	1
3	06-01-0124	BOLT, FLG .375-16 UNC ZP GRADE 5; 3/4" LG	4
4	06-01-0220	BOLT .375-16 X 3.75 CONCRETE ZP	4
5	06-03-0033	NUT LOCK FLG .375-16 GR8	4

ADJUSTABLE STAND ASSEMBLY (05-03-1471)



Item #	Part #	Description	Qty
1	05-03-1479	WDMT PNL ADJ	1
2	05-03-1545	WDMT PANEL STAND	1
3	06-01-0115	BOLT CRG .375-16 X 1.00 ZP GR5	4
4	06-01-0287	BOLT U .375-16 X 2.50 X 3.125 ZP	2
5	06-03-0014	NUT LOCK FLG .375-16 ZP GR5	8
6	06-05-0004	WSHR FLAT .375 ZP	4
7	06-10-0056	PLUG TBG RD RIB POLY 2.38 X .156W	1
8	103651	PLT PNL MT	1

NOTES:

USC LIMITED WARRANTY

SECTION G

USC, LLC, (Manufacturer) warrants its seed treating equipment as follows:

1. **Limited Warranty:** Manufacturer warrants that the Products sold hereunder will be free from defects in material and workmanship for a period of 18 months from date of shipment. If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type and nature as to be covered by this warranty, Manufacturer shall, at its expense, furnish replacement Products or, at Manufacturer's option, replacement parts for the defective products. Shipping and installation of the replacement Products or replacement parts shall be at the Buyer's expense.

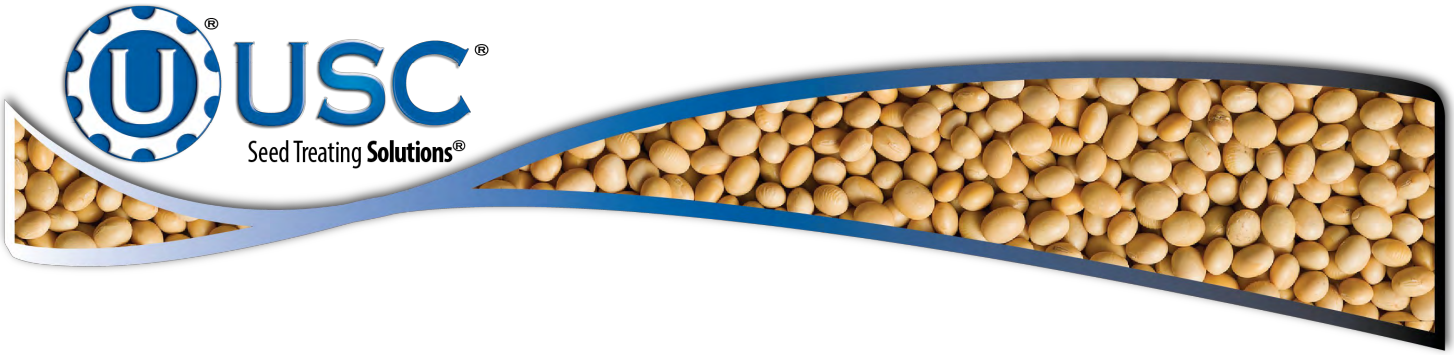
2. **Other Limits:** THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Manufacturer does not warrant against damages or defects arising from improper installation (where installation is by persons other than Manufacturer), against defects in products or components not manufactured by Manufacturer, or against damages resulting from such non-Manufacturer made products or components. Manufacturer passes on to the Buyer the warranty it received (if any) from the maker of such non-Manufacturer made products or components. This warranty also does not apply to Products upon which repairs and/or modifications have been effected or attempted by persons other than pursuant to written authorization by Manufacturer. Manufacturer does not warrant against casualties or damages resulting from misuse and/or abuse of product(s), acts of nature, effects of weather, including effects of weather due to outside storage, accidents, or damages incurred during transportation by common carrier.

3. **Exclusive Obligation:** THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of Manufacturer shall be to repair or replace the defective Products in the manner and for the period provided above. Manufacturer shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall Manufacturer be liable for incidental, special, or consequential damages.

4. **Other Statements:** Manufacturer's employees or representatives' oral or other written statements do not constitute warranties, shall not be relied upon by Buyer, and are not a part of the contract for sale or this limited warranty.

5. **Return Policy:** Approval is required prior to returning goods to USC, LLC. A restocking fee will apply.

6. **Entire Obligation:** This Limited Warranty states the entire obligation of Manufacturer with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.



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