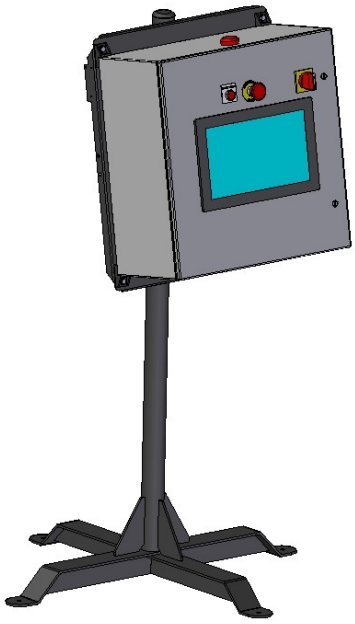
U-Treat Automation

For Automated Main Control Panels

(Operates a Wide Range of Bin Sites, Treaters, Pumps and more)



Operators Manual

Software Release: U-Treat v5.0

Document: TD-09-06-1050 Revision: G Effective Date: Dec. 2024






2320 124th Road, Sabetha, Kansas 66534 PH: (785) 431-7900 www.usclic.com

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.

The technical information provided in this document is based on extensive testing under controlled conditions at the USC research and development facility. This information is given without guarantee as the conditions of operation and storage of the equipment are beyond our control. Variables such as temperature, humidity, viscosity of chemical products and changes in seed size or variety may all effect the accuracy of application and seed coverage. Periodically check the equipment calibration while treating and make adjustments as required. This will insure the optimum seed coverage.

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 upper right hand corner of the main control panel.

SERIAL NUMBER:_____

TABLE OF CONTENTS

SAFETY INSTRUCTIONS

SECTION A

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.

MOTS ET SYMBOLES SÉCURITÉ

Il est très important que les opérateurs et le personnel d'entretien à comprendre les mots et les symboles qui sont utilisés pour communiquer des informations de sécurité. Mots de sécurité, de leur signification et le format, ont été normalisés pour les fabricants américains et publié par l' American National Standards Institute (ANSI). La Communauté européenne (CE) a adopté un format différent sur la base de l'Organisation internationale de normalisation (ISO) et des directives de machines applicables. Les deux formats sont présentés ci-dessous. Les symboles graphiques ne sont pas standardisés, mais la plupart des fabricants utilisent une variante de ceux observés dans ce manuel.

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

! DANGER Indique une situation extrêmement dangereuse qui, si pas évitée, entraînera la mort ou des blessures graves.

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

! ATTENTION Indique une situation potentiellement dangereuse qui, si pas évitée, pourrait entraîner la mort ou des blessures graves.

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

! AVERTISSEMENT Indique une situation potentiellement dangereuse qui, si pas évitée, peut entraîner des blessures mineures ou modérées et / ou des dommages.

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

CONSIGNES DE SÉCURITÉ Fournit des informations supplémentaires que l'opérateur doit être conscient de d'éviter une situation potentiellement dangereuse.

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

AVIS Avis est utilisé pour informer les gens des informations de maintenance qui ne est pas danger lié importante installation, l'exploitation ou.

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

Symbole de puissance verrouillage obligatoire. Débranchez, de verrouillage et de déconsignation énergie électrique et d'autres sources avant d'inspecter, de nettoyage ou de la maintenance de ce panneau.

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.

Sécurité Symbole International Alert . Le point d'exclamation (!) Entouré par un triangle jaune indique que un risque de blessure existe . Cependant, il ne indique pas la gravité des blessures potentielles. Le point d'exclamation (!) Est également utilisé avec les symboles DANGER, AVERTISSEMENT et ATTENTION de sorte que le risque de blessure est indiqué.

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

Symbole de danger d'électrocution . Ce symbole indique qu'un danger d'électrocution existe. Des blessures graves ou la mort pourraient résulter de contact haute tension.

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

Danger d'électrocution international. Ce symbole indique qu'un danger d'électrocution existe. Des blessures graves ou la mort pourraient résulter de contact haute tension.

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

Obligatoire Lire Symbole d'action Manuel. (Format ISO) Ce symbole indique le personnel de lire le manuel de l'opérateur avant de réparer ou d'utiliser l'équipement.

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

Obligatoire Lire Symbole d'action Manuel . Ce symbole indique le personnel de lire le manuel de l'opérateur avant de réparer ou d'utiliser l'équipement.

DANGER! RISK OF ELECTRIC SHOCK AND ARC FLASH

Avoid any alteration to the equipment. Alterations may produce dangerous situations, where serious injury or death may occur. This equipment shall be installed in accordance with local installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made. Owners/operators are responsible for knowing what requirements, hazards, and precautions exist with this equipment. Owners/operators are responsible for informing all personnel associated with the equipment and all who are in the general area of the equipment, the requirements, hazards, and precautions that exist with this equipment. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation and has received safety training to recognize and avoid the hazards involved. Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and/or with this product. Owners/operators must ensure that all authorized persons have sufficient technical training, knowledge, and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical, and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work. Servicing and maintaining the equipment should only occur if the equipment is deenergized and properly locked out and tagged out. If it is unfeasible to service or maintain the equipment while deenergized, the following standards shall be referenced to ensure safe practices are being followed and proper PPE is being used: 29 CFR § 1910.333 and 29 CFR § 1910.137. No responsibility is assumed by USC, LLC for any consequences arising out of the use of this material.

DANGER! RISQUE DE CHOC ÉLECTRIQUE ET D'ARC ÉLECTRIQUE

Évitez toute modification de l'équipement. Les modifications peuvent produire des situations dangereuses, pouvant entraîner des blessures graves ou la mort. Cet équipement doit être installé conformément aux codes d'installation locaux et aux réglementations applicables qui doivent être scrupuleusement respectés dans tous les cas. Les autorités compétentes doivent être consultées avant la réalisation des installations. Les propriétaires / opérateurs sont responsables de connaître les exigences, les dangers et les précautions associés à cet équipement. Les propriétaires / opérateurs sont responsables d'informer tout le personnel associé à l'équipement et tous ceux qui se trouvent dans la zone générale de l'équipement, les exigences, les dangers et les précautions qui existent avec cet équipement. L'équipement électrique doit être installé, utilisé, réparé et entretenu uniquement par du personnel qualifié. Une personne qualifiée est une personne qui possède des compétences et des connaissances liées à la construction et au fonctionnement du matériel électrique et à son installation et qui a reçu une formation en matière de sécurité pour reconnaître et éviter les risques encourus. Seules les personnes correctement formées qui connaissent et comprennent le contenu de ce manuel et toute autre documentation pertinente sur le produit sont autorisées à travailler sur et / ou avec ce produit. Les propriétaires / opérateurs doivent s'assurer que toutes les personnes autorisées ont une formation, des connaissances et une expérience techniques suffisantes et être en mesure de prévoir et de détecter les dangers potentiels pouvant être causés par l'utilisation du produit, en modifiant les paramètres et par les équipements mécaniques, électriques et électroniques. de l'ensemble du système dans lequel le produit est utilisé. Toutes les personnes travaillant sur et avec le produit doivent être parfaitement familiarisées avec toutes les normes, directives et réglementations de prévention des accidents applicables lors de l'exécution de ces travaux. L'entretien et la maintenance de l'équipement ne doivent avoir lieu que si l'équipement est hors tension et correctement verrouillé et étiqueté. S'il est impossible de réparer ou d'entretenir l'équipement lorsqu'il est hors tension, les normes suivantes doivent être référencées pour s'assurer que les pratiques de sécurité sont suivies et que des EPI appropriés sont utilisés: 29 CFR § 1910.333 et 29 CFR § 1910.137. Aucune responsabilité n'est assumée par USC, LLC pour les conséquences découlant de l'utilisation de ce matériel.

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 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.”

LES PROCEDURES DE VERROUILLAGE / ETIQUETAGE

Verrouillage / étiquetage est le placement d'un verrouillage / tag sur un dispositif d'isolement de l'énergie conformément à une procédure établie. Lors de la prise hors service des équipements pour effectuer la maintenance ou de réparation, toujours suivre les procédures de verrouillage / débranchement comme indiqué dan la norme OSHA 1910.147. Cette norme "oblige les employeurs à établir un programme et appliquer des procédures pour la fixation des dispositifs de verrouillage appropriés ou des dispositifs déconsignation à l'énergie dispositifs d'isolement et d' autre machines ou équipements désactiver pour éviter énergisant inattendu, start-up, ou la libération de l'énergie stockée dans le but de prévenir les blessures aux employés."

EMERGENCY STOP

There is an Emergency Stop push button on all LPV and LPX Seed Treaters which is located on the Treater Control Panel. The LPX Automated Treater has an additional Emergency Stop pushbutton on the Main 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.

ARRET D'URGENCE

Il existe un bouton-poussoir d'arrêt d'urgence sur tous les produits LPV et LPX Seed Treaters qui se trouvent sur le panneau de commande Treater. Le LPX Automated Treater dispose d'un bouton-poussoir d'arrêt d'urgence supplémentaire sur le panneau de commande principal. Les actionneurs de l'arrêt d'urgence doivent être colorés en couleur. Le fond immédiatement autour de l'actionneur de l'appareil doit être coloré JAUNE. Le bouton-poussoir du servomoteur doit être du type à la tête de la palme ou au champignon.

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.

ARRET CONTROLE

Ce est l' arrêt du mouvement de la machine en réduisant le signal de commande électrique à 0 (zéro) dès que le signal d'arrêt a été reconnue.

HAZARD REVIEW

RISQUE EXAMEN

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.

Risque d'électrocution

Les accidents d'électrocution sont les plus susceptibles de se produire lors de la maintenance du système électrique ou pour travailler sur ou à proximité du câblage haute tension exposé. Ne existe pas ce danger lorsque l'alimentation électrique a été déconnecté, bien verrouillé et étiquetés sur.

⚠ WARNING

! AVERTISSEMENT

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.

Démarrer danger automatique

Cet équipement peut être contrôlé par un système auto matisé et peut démarrer sans avertissement. Sources de l'équipement contrôlé à distance non débranché correctement, lock-out, et tous déconsignation énergie crée une situation très dangereuse et pourrait causer des blessures ou même la mort. Se IL VOUS PLAÎT rester à l'écart et d'être vigilant.

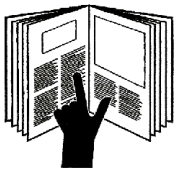
YOU are responsible for the **SAFE** operation and maintenance of your USC, LLC equipment . **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained 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 labels 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 labels 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.

⚠ WARNING

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.

! AVERTISSEMENT

Avant de placement de l'équipement, assurez-vous que sol est relativement plat. L'équipement peut tomber ou mal fonctionner si le sol est trop inégale, endommager l'équipement et / ou causer des blessures.

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 labels clean. Replace any sign that is damaged or not clearly visible.

SAFETY LABELS

1. Keep safety labels clean and legible at all times.
2. Replace safety labels that are missing or have become illegible.
3. Replaced parts that displayed a safety label should also display the current label.
4. Replacement safety labels are available. Contact USC.

How to Install Safety Labels:

- 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.

Situé sur l'équipement USC vous trouverez des étiquettes de sécurité. Veillez à toujours lire et suivre toutes les instructions sur les étiquettes.

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

Gardes fournis avec des équipements USC doivent rester en place pendant le fonctionnement.

C2D2 SPECIFICATIONS AND LABELS

1. All 120VAC connections must be hard wired to a listed IP65 rated enclosure in accordance with local electrical codes.

2. The C2D2 certifications are only valid for equipment operating at 60 HZ.

3. The approved operating temperature for this equipment is between 0°C (32ºF) and 40°C (104°F).

4. All RJ45 and USB pass-through connector caps must remain closed to achieve a C2D2 rating. Hard wire these connections in accordance with local electrical codes.

The following labels and certification plates must be mounted to the outside of the control panel so that they are in plain view. These labels must only be applied at the USC Sabetha plant.

SECTION B INSTALLATION

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

HAUTE TENSION ~ Toujours débrancher la source d'alimentation avant de travailler sur ou près du panneau de commande ou les câbles.

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

HAUTE TENSION ~ Utilisez des outils isolés lors des réglages, tandis que les commandes sont sous tension.

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

Installation permanente peut exiger cordons électriques, des tubes supplémentaires chimique, et les conduites d'air, puisque chaque installation est.

USC equipment may operate within a Group II, Division 2, Class G hazardous area which contains seed dust. If so, the equipment must be certified for use in this area. 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 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.

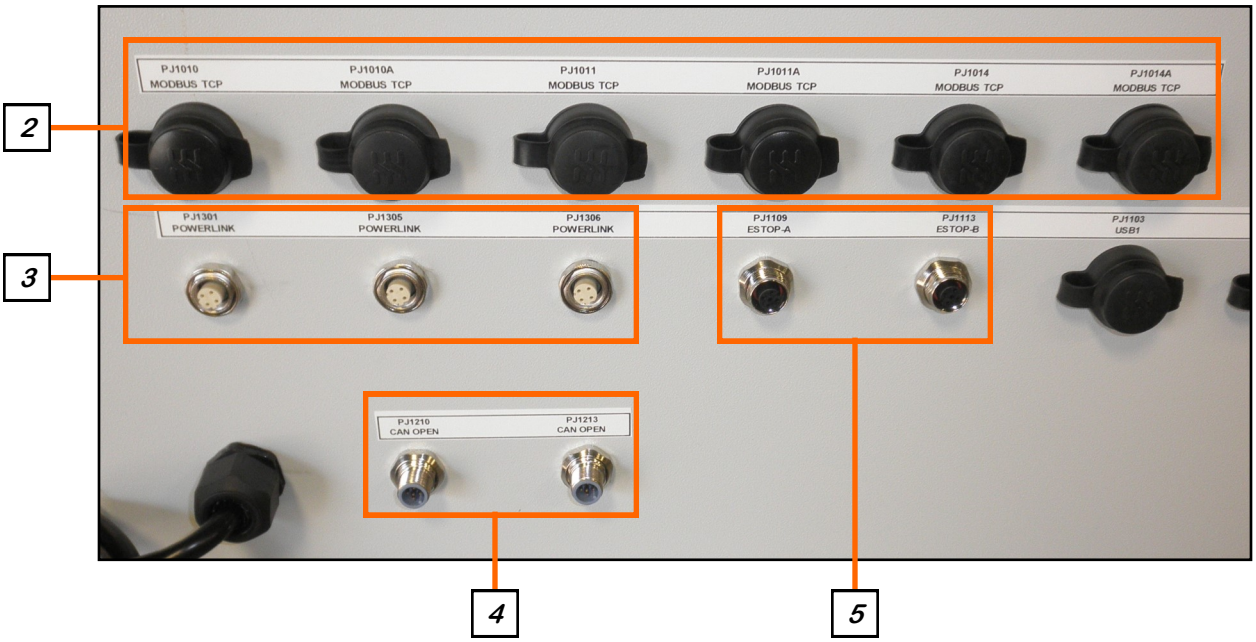
INSTALLATION

USC équipement peut fonctionner dans un Groupe II, Division 2, Class G zone dangereuse qui contient la poussière des semences. Si oui, l'équipement doit être certifié pour une utilisation dans ce domaine. Pour éviter la possibilité d'une explosion enflammé par l'électricité statique, tous les équipements USC devrait être la terre en attachant une bande de liaison à la structure métallique et la sécurisation cette bande au point de masse du fabricant.

Si étiquetés en conséquence, les produits USC sont conçus pour être conformes à la norme CSA 22.1 pour une utilisation dans une Class II, Division 2, Groupe G environnement. Lors du raccordement du USC alimentation du système cordon dans une alimentation, d'abord déterminer si l'offre est également dans la zone dangereuse où se trouve le système USC. Si oui, nous recommandons que le pouvoir soit câblé dans la source. Ne pas utiliser une prise électrique standard à cet effet. Pour les autres méthodes acceptables de se connecter à une source d'alimentation, ou tout autre matériel divers supplémentaire au système USC dans un endroit dangereux, se il vous plaît consulter la norme CSA 22.1, Section 18-200 et 18-274. Consultez la section appropriée et assurer la conformité avec l'une des options proposées.

Lors de la connexion à l'équipement USC depuis un emplacement distant et l'équipement USC est dans une classe dangereuse II, Groupe G environnement, les clients sont invités à suivre les exigences dans CSA 22.2 no. 25. Plus de détails peuvent également être trouvés dans 22,1 CSA 18-252 (Les méthodes de câblage). Il existe diverses options couvertes dans cette section pour le câblage dans une Class II, Groupe G (poussière) environnement. Sélectionnez la meilleure méthode adaptée pour votre emplacement spécifique.

MAIN CONTROL PANEL



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. There are six MODBUS TCP Ethernet connectors on the Main Control Panel (MCP). If the installation has a version 3 four pump controller, a twelve pump controller, or revision 01D PS60 pump panel, connect them using one of the Ethernet Ports. These are also used for connecting scale heads, printers, etc.

3. If being used with version 4 control panels, connect a cable with four pin connector to one of the three Powerlink connectors on the MCP. Connect the other end to the Powerlink connector on the closest control panel. Repeat this process until all control panels are connected. It may be MCP to Treater to Tri-Flo® to Bin Site panel. The order or number of devices is not important. It is important that all panel are connected. All revisions of the PS60 pump stand control panel **except revision 01D** will need to connected in a similar configuration.

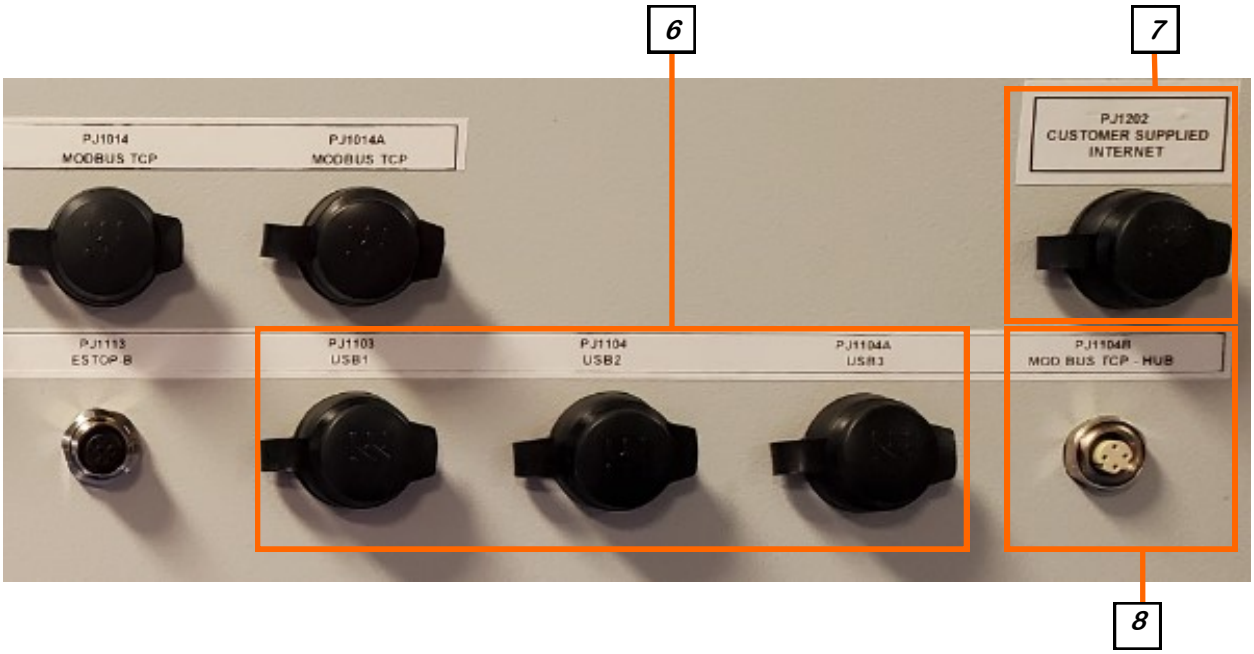
4. There are also two CAN OPEN connectors. These would only be used when the MCP is being installed on a system with Version 1, 2 or 3 control panels. Connect the gray cable with light blue endson the bottom of the MCP to one of OPEN CAN connectors on the bottom of closest control panel. Repeat this process until all control panels are connected in a daisy chain configuration. It may be MCP to Treater to Tri-Flo® to Bin Site panel. The order or number of devices is not important. It is important that no control panel is left out of the chain. Connect the two light blue plugs onto each of the remaining open PJCAN connectors on the first and last panel.

5. Connect the red cable to the PJESTOPA on the Main Control Panel (MCP) and then to the PJESTOPB on the next panel that is closest to the MCP. Repeat this process until all control panels are connected in a daisy chain configuration. It may be MCP to Treater to Tri-Flo® to Bin Site panel. The order or number of devices is not important. It is important that each cable is ran from an A connection to a B connection (never A to A or B to B), and that no control panel is left out of the chain. Connect the two red plugs onto each of the remaining open PJESTOP connectors on the first and last panel.

INSTALLATION

6. There are three USB ports located on the bottom of the panel that may be used to plug in a mouse, keyboard or download reports to a compact flash device.

7. There is also a connector (PJ1202) where the customer supplied internet connection is made. This is required to use the E-Mail Reports function.



8. The last port is the HUB Uplink port (PJ1014B). This port allows the Automated Main Control Panel to communicate to the HUB liquid blending system.

NOTICE

If using a scale printer, plug the printer communication cable into one of the available MODBUS 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.**

AVIS

Si vous utilisez une imprimante à échelle, branchez le câble de communication de l'imprimante dans l'un des ports Ethernet MODBUS disponibles situés en bas du panneau de commande principal. L'imprimante doit être située dans une zone sécurisée. **Ne pas utiliser dans une zone dangereuse contenant de la poussière.**

SECTION C ELECTRICAL OPERATION

The U-Treat Automation Software is highly configurable and can operate a wide array of USC equipment and even some 3rd-party equipment. As such, the various screens you may see throughout the program can vary in content and function depending on the specific combination of equipment you have configured for your system or site.

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

! DANGER HAUTE TENSION ~ Toujours débrancher la source d'alimentation avant de travailler sur ou près du panneau de commande ou les câbles.

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

! DANGER HAUTE TENSION ~ Utilisez des outils isolés lors des réglages, tandis que les commandes sont sous tension.

⚠CAUTION 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 panels.

! ATTENTION Seules personnes autorisées doivent travailler sur le panneau de commande. Ne jamais laisser quelqu'un qui n'a pas lu et se sont familiarisés avec le manuel d'ouvrir ou de travail du propriétaire sur les panneaux de contrôle.

General Panel Descriptions

- The Automated Main Control Panel is a plug connected enclosure that contains the IPC (Industrial Programmable 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 120V plug.

- The 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. Power for the VFD's that control the seed wheel, atomizer and treater drum is supplied here. Power to this panel is typically hard wired on-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 Panel Descriptions

- The 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 up to two standard 120V plugs. One may exist for a manual ON/OFF switch controlling a mix tank motor and another will exist for the pump stand control panel.

- The Bin Site Control Panel (BSCP) is a 42 x 36 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).

NOTICE

USC strongly recommends that you implement a routine data export strategy. This will give your company a regularly updated back-up file containing all of the important information in your seed treating system. Customer, seed, chemicals, inventory and recipe data may easily be restored in the event of a catastrophic system failure, such as a lightening strike or PLC failure. Reports may not be imported back into the system, but you will still have an electronic copy for your records. USC recommends daily back-ups.

AVIS

USC vous recommande fortement de mettre en œuvre une stratégie de routine d'exportation de données. Cela donnera à votre entreprise un fichier de sauvegarde régulièrement mise à jour contenant toutes les informations importantes dans votre système de traitement des semences. Clients, semences, bin et chimiques profils, ainsi que des recettes chimiques peuvent être facilement restaurées en cas de défaillance catastrophique du système, comme une grève de la foudre ou l'échec PLC. Rapports ne peuvent pas être importés dans le système, mais vous aurez toujours une copie électronique pour vos dossiers. USC recommande sauvegardes quotidiennes.

NOTICE

USC recommends the use of a surge protection device with a minimum rating of 400 Joules for all automated main control panels.

AVIS

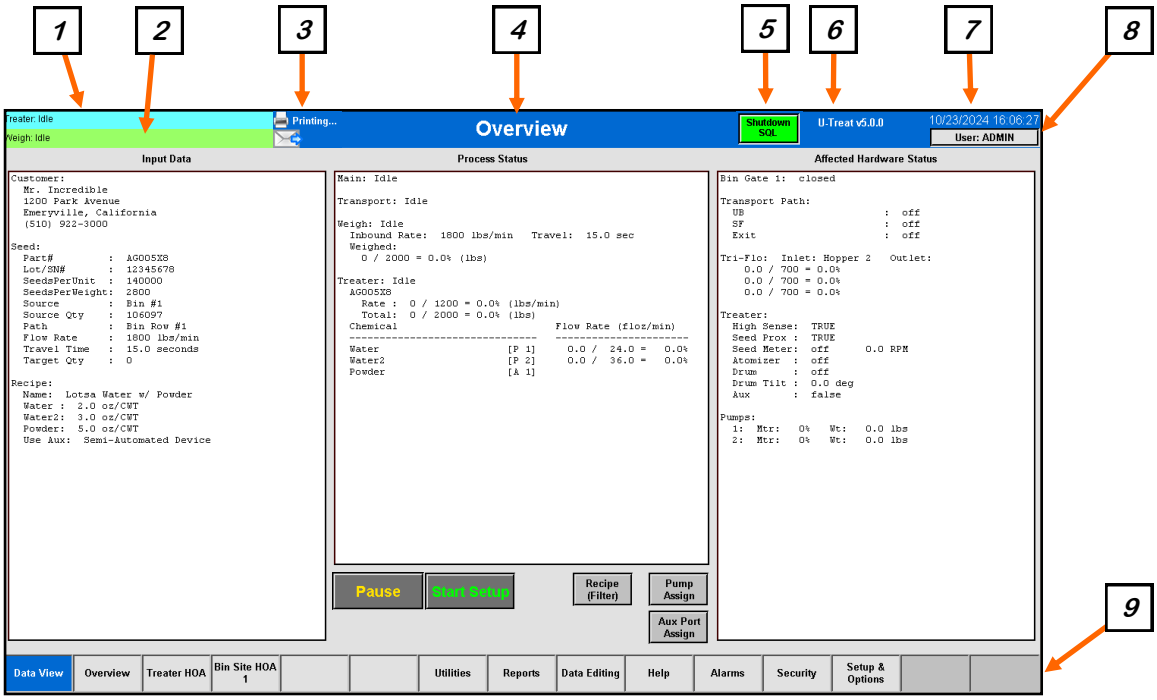
USC recommande l'utilisation d'un dispositif de protection contre les surtensions avec une cote minimale de 400 joules pour tous les principaux panneaux de contrôle automatisés.

SPLASH SCREEN

This screen is a starting point when your system first boots up. A progress indicator will move along until all startup steps are complete, after which you can then press anywhere on the screen to continue into the program.

GENERAL LAYOUT, STATUS AND NAVIGATION

Once you are beyond the Splash screen, all other areas of the program will have the following common details...



1. **TREATER STATUS:** This status line details the automation process of the Treater.

2. **WEIGH STATUS:** This status line details the automation process of the Weighing system.

3. **PRINTING & EMAILING STATUS:** This area has a couple of icons that will appear when printing or email operations are currently underway.

4. **SCREEN TITLE:** This area contains the title of the current page.

5. **SQL STATUS AND CONTROL:** If you're using SQL for storing your data, this button appears in the top bar. It shows the current state of the SQL database service. Clicking on it allows you to stop or start the SQL database service. It is located in this prominent spot because SQL needs shut down nicely before powering off the panel.

6. **PROGRAM VERSION:** This displays the program name and version.

7. **CLOCK:** This displays the current system date and time (or clock).

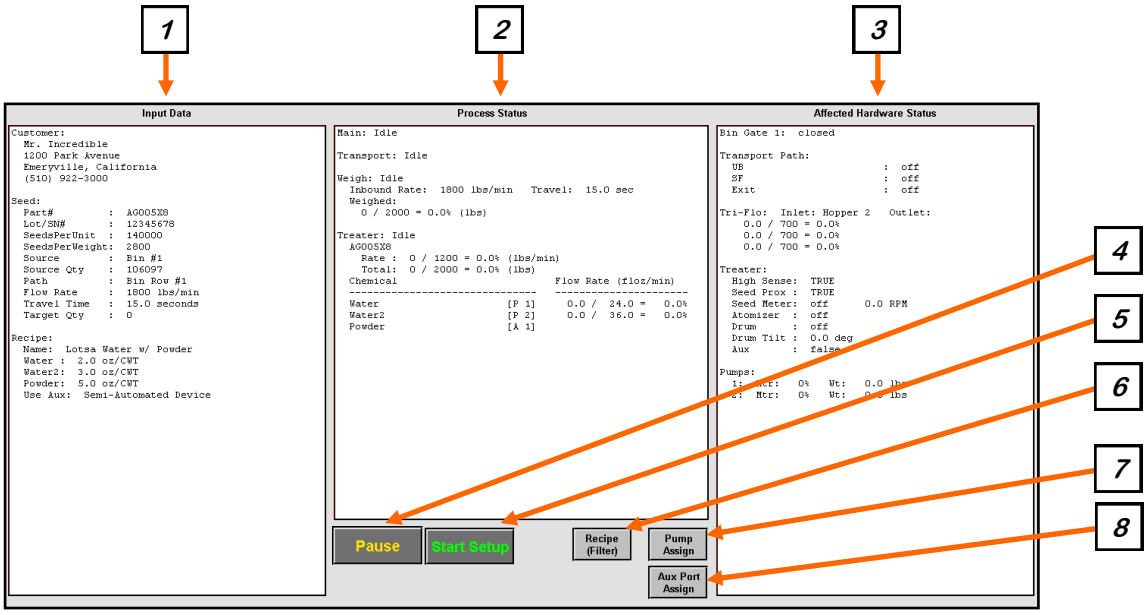
8. **USER LOGIN:** This is a quick-logon feature.

9. **NAVIGATION MENU:** This allows navigation throughout the program. Blank areas can display additional things depending on your system's configuration.

DATA VIEW SCREEN

This screen is an overview screen but done so as a completely text-based report-like format split out into 3 categories, organized by priority left to right, top to bottom. The left side presents all the user input data that feeds the process. The middle section displays the status of the process, or automated run. The right side displays all the hardware being affected by the process. The middle and right sections are generally listed out top to bottom relative to the path the seed takes through the system.

This screen also allows the configuration and operation of an automated run.



1. INPUT DATA: This area lists out all the user data records and their content which feed into the automation process.

2. PROCESS STATUS: This area lists out various automation process modules, their states and numerous data and statistics regarding those processes.

3. HARDWARE STATUS: This area shows all the hardware states and statistics.

4. PAUSE: This button will appear once an automated run begins and it will allow you to pause the whole system.

5. START SETUP: This button invokes the Start Wizard popup.

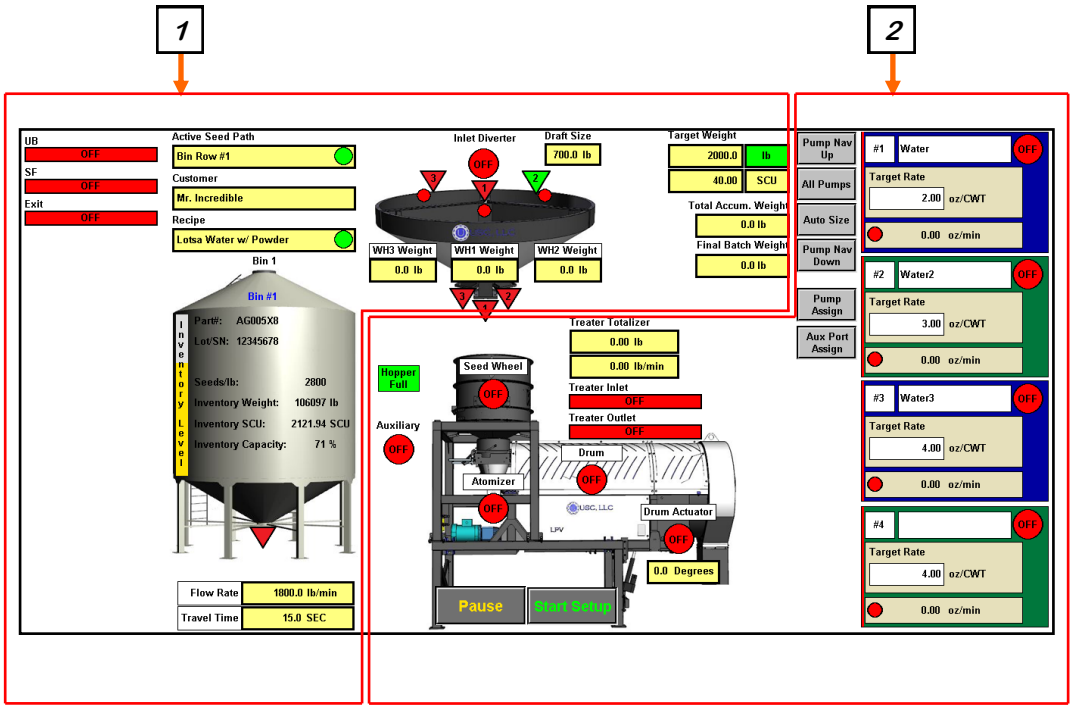
6. RECIPE FILTER: This toggles a filter to display all or just recipe-related pumps.

7. PUMP ASSIGN: This invokes the Pump [Inventory] Assignment popup.

8. AUX ASSIGN: This invokes the Aux[iliary port Inventory] Assignment popup.

OVERVIEW [GRAPHICAL] SCREEN

This screen is also an overview screen but done so as a graphical representation of all processes and hardware together. There are two main sections to the screen...



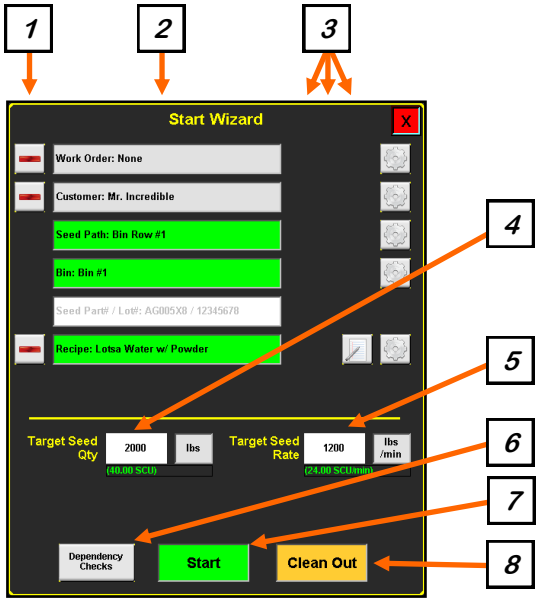
1. BIN SITE CONTRLS: The control and displays in this area are used for the Bin Site part of the system.

2. TREATER CONTROLS: The control and displays in this area are used for the Treater part of the system.

START WIZARD POPUP

The Start Wizard popup is where you can setup most of the information, settings and parameters necessary to perform an automated run. Once everything is set, you can hit the Start button and begin the operation.

This popup is very dynamic in nature and will present a wide variety of options depending on how your system is configured, so, you may or may not see everything presented below.



1. CLEAR LINE ITEM: These buttons clear a particular line item's selection.

2. SELECTIONS: These are the data selections that feed the automation process.

3. VIEW/QUICK-EDIT/SETTINGS: These buttons will show or not based on the particular line item. VIEW is not currently used. QUICK-EDIT is used for a couple of items to lend quick access to commonly tweaked settings. SETTINGS will take you to the data editing area so you can review and maybe edit the record you selected.

4. TARGET SEED QTY: This allows you to specify weight or SCU quantity of seed to be processed. This is typically used by the Weighing system.

5. TARGET SEED RATE: This allows you to control the seed processing rate of the treater in weight per minute or SCUs per minute.

6. DEPENDENCY CHECK: This produces an analysis report designed to help you avoid pit-falls, fix problems and prepare for a successful automated run. Green, yellow and red coloring of Start Wizard line items are direct results of Dependency Check. Green means the check results are good. Yellow means there is a warning item but it will not keep you from running. Red means there is a show-stopper you must address.

7. START: This button starts an automated run. It will be locked out if any identifiable show-stopping circumstances are present.

8. CLEAN OUT: This button starts an automated run, but with a limited scope of clearing out whatever seed might still remain in the system.

PUMP ASSIGNMENT POPUP

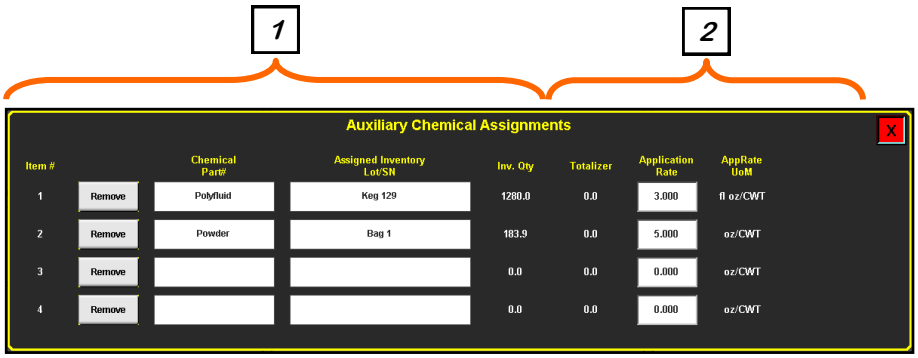
The Pump Assignment popup is where you can assign inventory to each pump and set various parameters like Calibration Ratio, Density and LIW Auto Calibration. What is presented will depend on your various pump configurations.

1. INVENTORY: This section is where you can remove or assign inventory to each pump. It also shows the current amount of inventory remaining on each pump.

2. SMART PUMP CACHE DATA: In previous versions of U-Treat, we had chemical profiles that had to be filled out. In this system that no longer exists and instead we have a Smart Pump Cache that automatically remembers the statistical and parameter data of each chemical and it is remembered uniquely per pump. Once a pump has seen a particular chemical, you can switch out several different chemicals on that pump and when you come back to the previous chemical, you'll see it automatically remembers all of your info for it. Also, depending on the configuration of each pump, this section may or may not show everything you see in the above picture. LIW pumps require all the fields shown above but Flow Meter pumps only require the Calibration Ratio field.

AUX ASSIGNMENT POPUP

The Aux[iliary] Assignment popup is where you can assign up to 4 inventory items that may be driven by the Aux port signal during a run. This allows for prompting and tracking of products being applied by 3rd party equipment on the Aux port.



1. INVENTORY: This section is where you can remove or assign inventory items. It also shows the current amount of inventory remaining for each item.

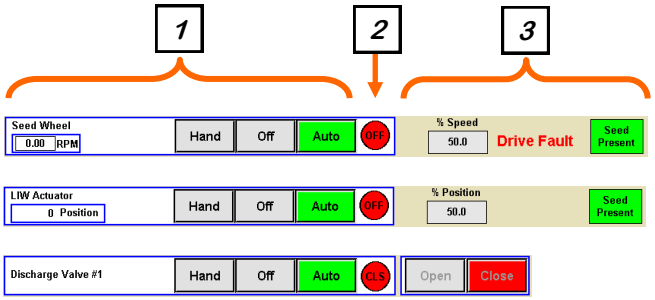
2. PROCESS-RELATED DATA: This section shows current totalizer values and current target application rates. Recipes can now demand use of inventory items that are assigned to the Aux port and as such those items will now also show up on the job report. The recipe will automatically populate the application rate field. On the Start Wizard's Dependency Check report, it will offer 3 different target rate calculations for you to use with your Aux-attached equipment for your convenience. Inventory on the Aux port will have an estimated totalizer track what should have theoretically taken place with your Aux-attached equipment and that's what will show on the job report.

A PRELUDE TO HOA

HOA stands for Hand-Off-Auto. It is an industrial controls standard for operating various equipment. When in Off, the particular hardware should never become energized. When in Hand, this is manually turning it on or energizing/activating it. When in Auto, it is now ready to be operated by an automated process.

How an HOA control set is presented will vary to some degree depending on the requirements/needs of the particular equipment. There will typically be the 3 HOA buttons and also a status lamp which often shows if the device is energized or de-energized, etc. Some equipment may have additional requirements like a speed or position setting and you'll usually see those presented further to the right of the standard objects.

Below, you'll see 3 different examples...



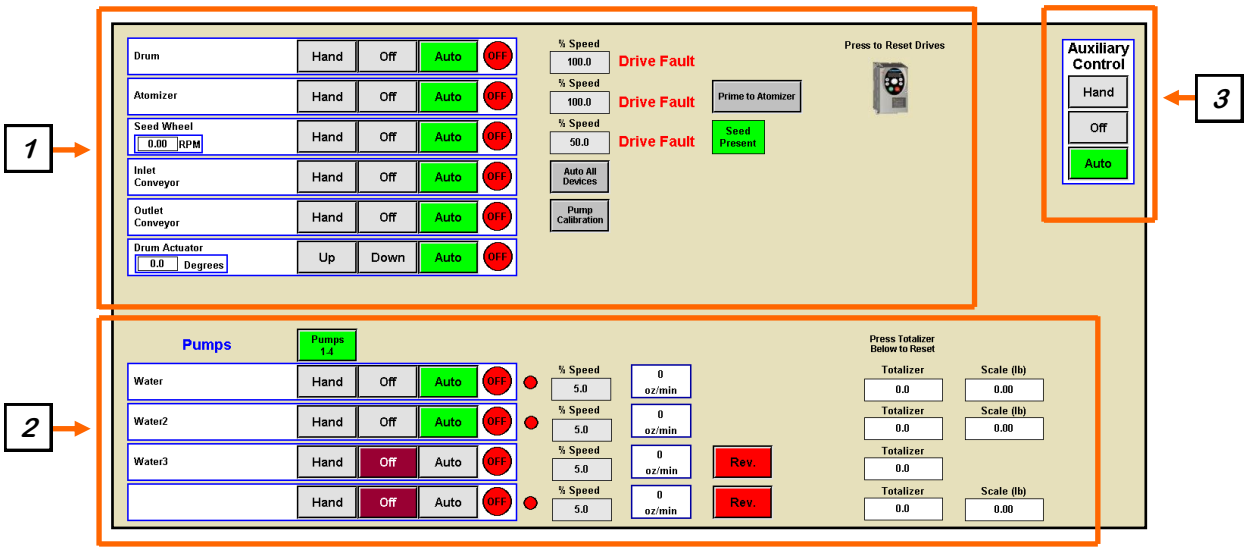
1. This section has an identifier label, usually identifying the device but sometimes alternatively identifying a product, like in the case with pumps. This label area sometimes also contains additional status information, and it also contains the standard HOA control buttons.

2. This section is where the standard status lamp appears. It usually shows an ON/OFF status but will sometimes be something alternative like CLOSE/OPEN (CLS/OPN). The text can often represent the output command and the lamp color itself may represent the sensor feedback, if available/applicable. The colors are usually Red indicating de-energized or closed and Green indicating energized or open. Any deviations beyond this would be for equipment with special requirements.

3. This section will have specialized features that are particular to each device. This may include speed or position inputs you can manually set and it may also provide additional status or feedback data as well. Use of inputs like speed or position may vary between devices. In the above example, the Seed Wheel and the LIW Actuator devices have such inputs and those are only used for when the device is in Hand. Not shown above, for a device like a Treater Drum, which also has a speed input, the speed input is instead used for both Hand and Auto operations.

TREATER HOA SCREEN

The Treater HOA (Hand-Off-Auto) screen gives you direct control over all the various devices that make up an entire Treater. It also gives you control over all the pumps that are attached to the Treater.



1. MOTOR CONTROLS: This section is for controlling each of the motors on the treater. It has an Auto All button to put all devices into Auto mode. It has a Prime to Atomizer button to run fluids from the pumps in Auto all the way to the Atomizer in preparation of performing an automated run. It has a Pump Calibration button so you can calibrate each of your pumps which can help increase pump accuracy.

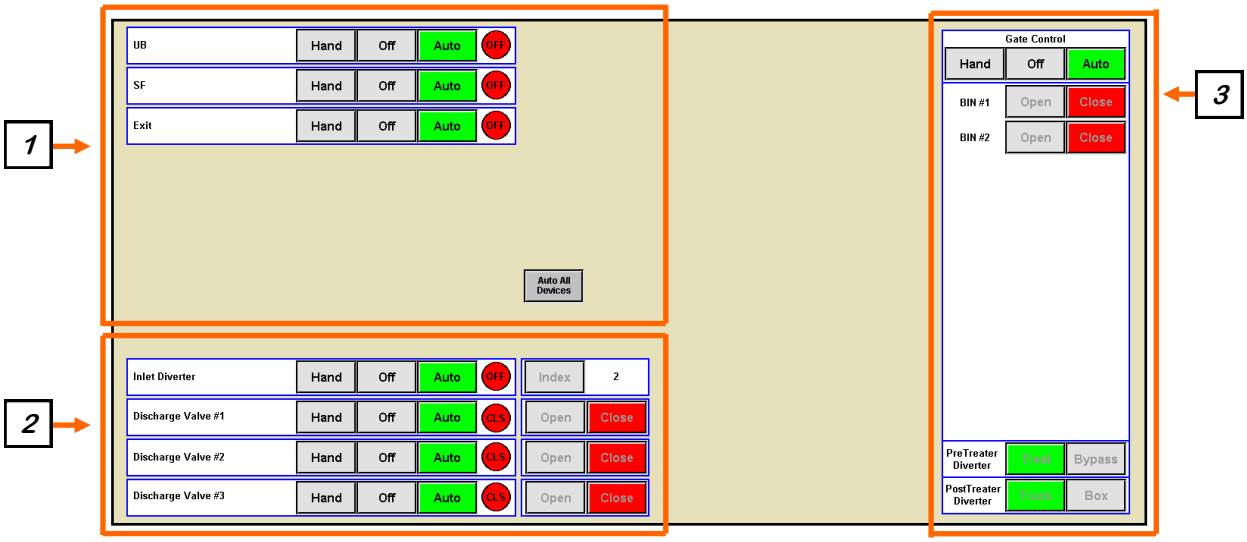
2. PUMP CONTROLS: This section is for controlling each of the pumps. It displays 4 pumps at a time, so if you have more than 4 pumps, tab buttons will be available along the top of this section to page between 3 groups of 4 pumps.

3. AUXILIARY CONTROL: This object gives you direct control of the Auxiliary output port.

NOTE: While HOA states are all directly controllable while you are on this screen, the Pump and Aux Auto/Off states are dictated by the Start Wizard's currently selected recipe as soon as you leave this page. This is the direct effect of a feature called Recipe Mode. In previous versions it was switchable by the user. In v5.0.0 this is on all the time and cannot be turned off.

BIN SITE HOA SCREEN

The Bin Site HOA (Hand-Off-Auto) screen gives you direct control over all the various devices that make up an entire Bin Site. This is comprised of a number of conveyors, bin gates and a weigh device. The weigh device will likely have one or more controllable components of its own as well.



1. CONVEYOR CONTROLS: This section is for controlling each of the conveyors attached to your bin site. If you have any encoders on your conveyors, they will show up in this section as well. There is also an Auto All Devices button here for your convenience.

2. WEIGH DEVICE: This section is for controlling the various components of a weigh device. The above example shows the controls for a USC Tri-Flo. It has an inlet diverter and 3 discharge gates.

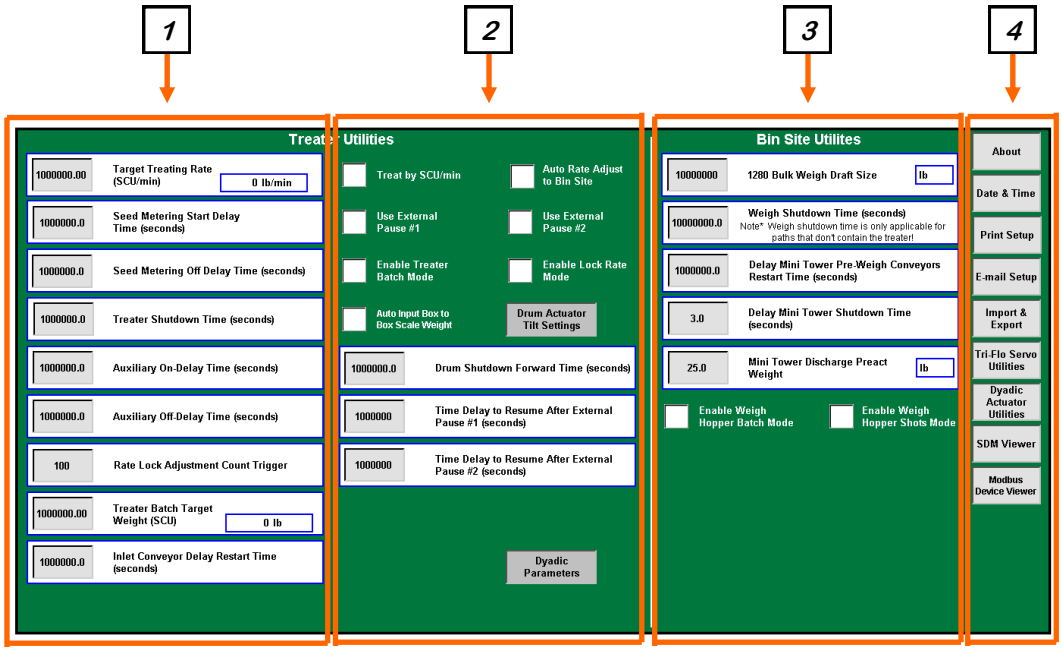
3. BIN GATES: This section is for controlling the discharge gate on each of your seed bins. If you have pre– or post– treater diverters, controls for those will appear at the bottom of this section.

NOTE: The above example image only shows a handful of conveyors and bins enabled. As more components are enabled, more control objects will show up on the screen. Also, if you have more than 10 bins, a second Bin Site HOA page will become available in your navigation menu at the bottom of the screen enabling you to operate up to a total of 20 bins.

UTILITIES SCREEN

The Utilities screen contains a lot of extra settings like speeds, delay timers, enabling and disabling various optional features, etc. Like many other screens, you may or may not see all the offerings in the below example due to the way your system is configured or due to what user id you are logged in with as not all features maybe relevant to your system or id.

To cover all the areas of this screen, we will split it out the screen into 4 sections spread over 4 pages...

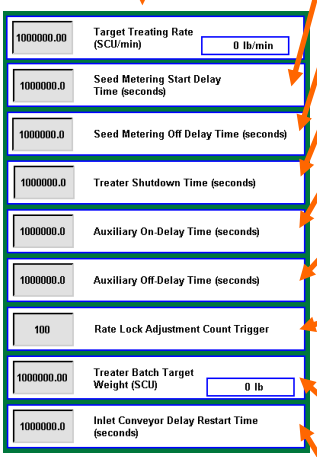


1. **Page 1 of 4 - Treater Utilities.**
2. **Page 2 of 4 - Treater Utilities.**
3. **Page 3 of 4 - Bin Site Utilities.**
4. **Page 4 of 4 - Utilities Right-Hand Navigation Buttons.**

UTILITIES SCREEN: TREATER (Page 1 of 4)

The Utilities screen contains a lot of extra settings like speeds, delay timers, enabling and disabling various optional features, etc. Like many other screens, you may or may not see all the offerings in the below example due to the way your system is configured as not all features maybe relevant to your system.

1. Target Treating Rate sets the treater's seed meter flow rate.



2. Seed Metering Start Delay Time allows you to delay the starting of the seed meter from the time seed is detected at its inlet.

3. Seed Metering Off Delay Time allows you to delay the stopping of the seed meter from the time seed is no longer detected at its inlet.

4. Treater Shutdown Time tells the treater how many seconds it needs to continue to run once seed is no longer detected at the seed meter inlet.

5. Auxiliary On-Delay Time allows you to delay the activation of the Aux port from the time seed is detected at the seed meter inlet.

6. Auxiliary Off-Delay Time allows you to delay the deactivation of the Aux port from the time seed is no longer detected at the seed meter inlet.

7. Rate Lock Adjustment Count Trigger is for Seed LIW systems and it allows for locking in the flow rate at a certain point after which it will no longer pays attention to the scale. This option says how many adjustments to the seed meter may occur before Rate Lock engages.

8. Treater Batch Target Weight is for when operating in Batch mode, this is where you define the target weight for each individual batch.

9. Inlet Conveyor Delay Restart Time is for Seed Wheel and Weigh Belt Treaters and it allows the operator to adjust the restart time of the inlet conveyor to so many seconds after seed is no longer detected by the proximity switch located at the top of the inlet hopper above the seed wheel.

UTILITIES SCREEN: TREATER (Page 2 of 4)

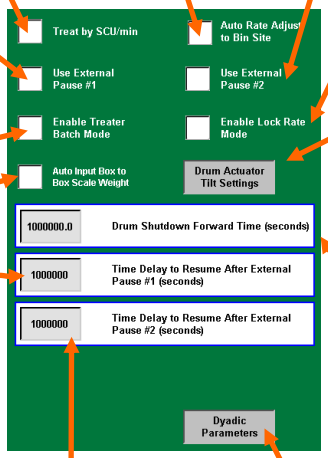
1. Treat by SCU checkbox switches the target seed flow rate between weight per minute or SCU/min.

2. Auto Rate Adjust to Bin Site is only present when a treater is used with a USC Bin Site and USC Tri-Flo ®. When checked, Target Treating Rate will automatically be adjusted to 2% slower than the bin site.

3. Use External Pause #2, once checked, the system pays attention to this input. How the system reacts to this input is configurable in the Setup area.

4. Use External Pause #1, once checked, the system pays attention to this input. How the system reacts to this input is configurable in the Setup area.

5. Enable Lock Rate will cause the LockRate feature to engage at the configured time during LIW seed treating.



6. Enable Treater Batch Mode, when checked, will process seed in batches of however many pounds are indicated by the Treater Batch Target Weight field.

7. Drum Actuator Tilt Settings will invoke a popup window where you can set several parameters for how you want the drum tilt to behave. (Not all treaters have this feature).

8. Auto Input Box to Box Scale Weight is for Box-to-Box LIW systems. When enabled, it reads the scale weight at the beginning of the run and puts it into the Treater's Target Weight.

9. Drum Shutdown Forward Time. Only present for Bayer RH series treater. It allows adjusting time the drum runs until it begins to run in reverse.

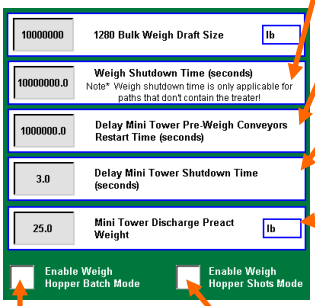
10. Time Delay to Resume After External Pause #1. When External Pause #1 goes away, this specifies how long to delay restarting the treater.

11. Time Delay to Resume After External Pause #2. When External Pause #2 goes away, this specifies how long to delay restarting the treater.

12. Dyadic Parameters will present configuration parameters for the LIW seed actuator.

UTILITIES SCREEN: BIN SITE (Page 3 of 4)

1. 1280 Bulk Weigh Draft Size is the maximum draft size allowed for a Rice Lake 1280 scale head.



2. Weigh Shutdown Time (in seconds): Adds run time for the outlet conveyor being used under a diverter when the seed path includes a weighing device but does not include treater. This is to ensure all seed for the run has been moved and the conveyor is empty before shutting down.

3. Delay Mini Tower Pre-Weigh Conveyors Restart Time (in seconds) allows adjusting the restart time of the inlet conveyor after the proximity switch located at the top of the fill hopper no longer detects seed.

4. Delay Mini Tower Shutdown Time (in seconds) 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 all three mini tower hoppers to clear out completely.

5. Mini Tower Discharge Pre-act Weight allows the operator to enter the weight left in the scale hopper that will trigger the discharge gate to close.

6. Enable Weigh Hopper Batch Mode.

7. Enable Weigh Hopper Shots Mode.

UTILITIES SCREEN: RIGHT-HAND NAVIGATION (Page 4 of 4)

1. About popup shows the software release, the machine's MCP number and also what the connection status is for the U-Connect Pro network link.

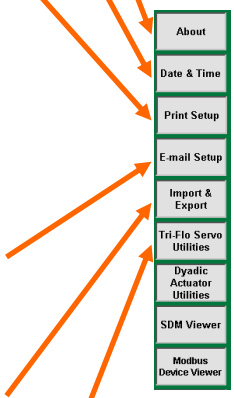
2. Date & Time allows you to set the system clock.

3. Print Setup allows you to configure which printer you have, its IP address, auto-print each job or not, how many copies to print and more. You can also fill out several fields of company info to display on your report print jobs.

4. Email Setup allows you to configure if and when to email and who to email to.

5. Import & Export allows you to import and export data one data type (or table) at at time to and from a USB drive.

6. Tri-Flo Servo Utilities allows you to manually work with your Tri-Flo inlet servo when troubleshooting problems.



7. Dyadic Actuator Utilities allows you to manually work with your Dyadic Actuator for LIW seed flow gates when troubleshooting problems.

8. System Diagnostics Manager is a B&R tool for the PLC runtime that allows you to analyze various PLC and hardware issues. This includes observing CAN and POWERLINK gear.

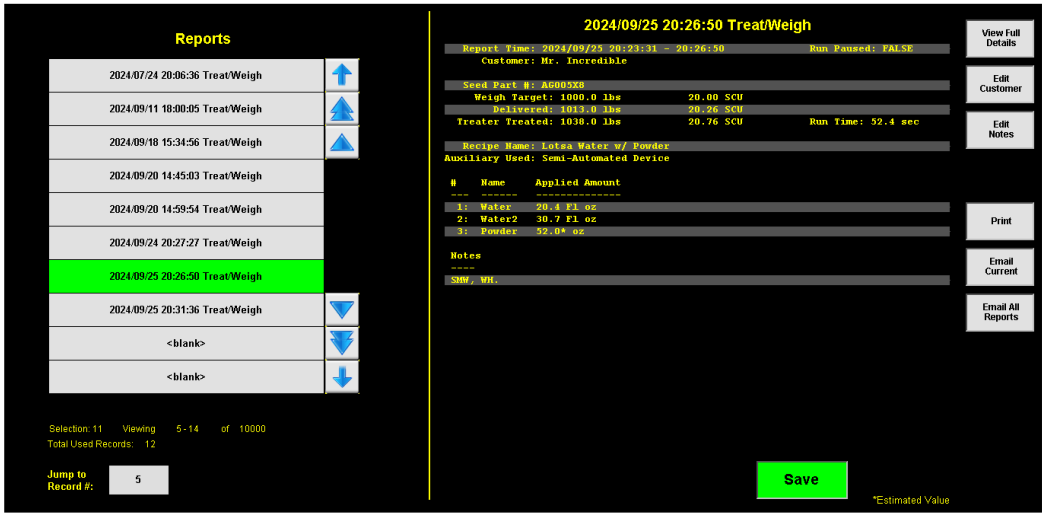
9. Modbus Device Viewer allows you to observe communications with any of our Modbus/TCP equipment.

Note: Many of the above options may not be visible either because of your system configuration or because of the user id you are currently logged in with. Also, items 6 - 9 are diagnostics tools for testing and troubleshooting and they will typically be used by USC technicians or USC phone support personnel.

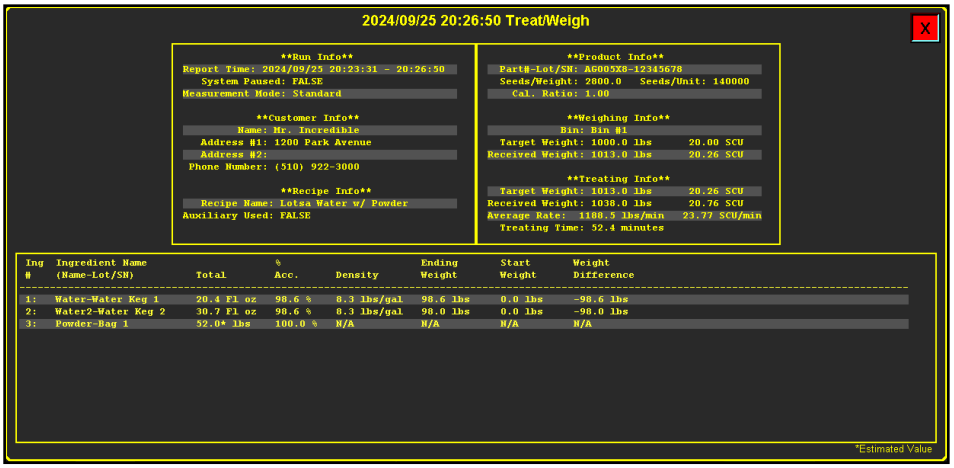
REPORTS SCREEN

This screen is where you can find all of the job reports that have been generated each time you performed an automated run with your machine. The left side allows you to navigate through the records and select which one you wish to view. The right side displays the report content of the selected record in an abbreviated format. On the right side are additional actions available for the selected record, one of which will give you a full details view of the entire report. Other options are as follows…

- Change the customer associated with the report.
- The ability to edit the Notes field.
- Print the selected record.
- Email the selected record.
- Email all reports in a single email (destination indicated in Email Setup).



Full Details View



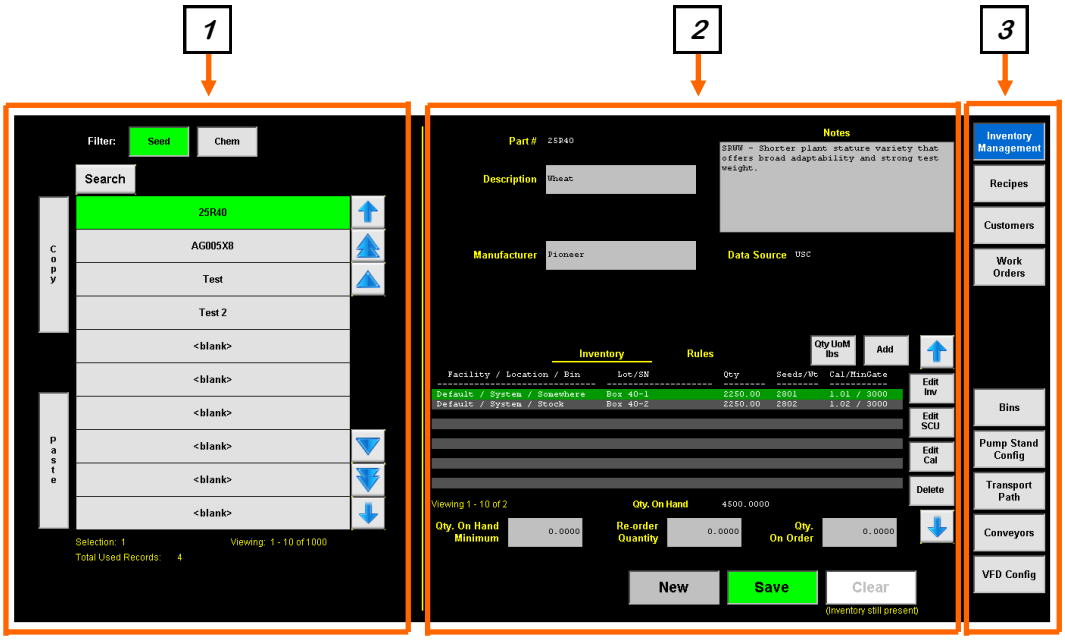
DATA EDITING

The Data Editing area is where you can create/edit/delete all the data necessary to operate your equipment.

For people familiar with versions of U-Treat older than v5, this newer version has a number of changes to its data organization, removing data redundancies, simplifying or automating certain things and also expanding capabilities for the future. As such, there is now a robust inventory management system. Seed profiles and chemical profiles, as they were once known, are now manifest in significantly different ways. The bulk of the setup work now centers around Inventory Management and finishes out with Recipes and Customers.

For those interested in managing their work load, we now optionally have a feature available called Work Orders. (See Work Orders page for more details).

U-Treat v5 now optionally supports SQL; very useful for certain corporate scenarios.



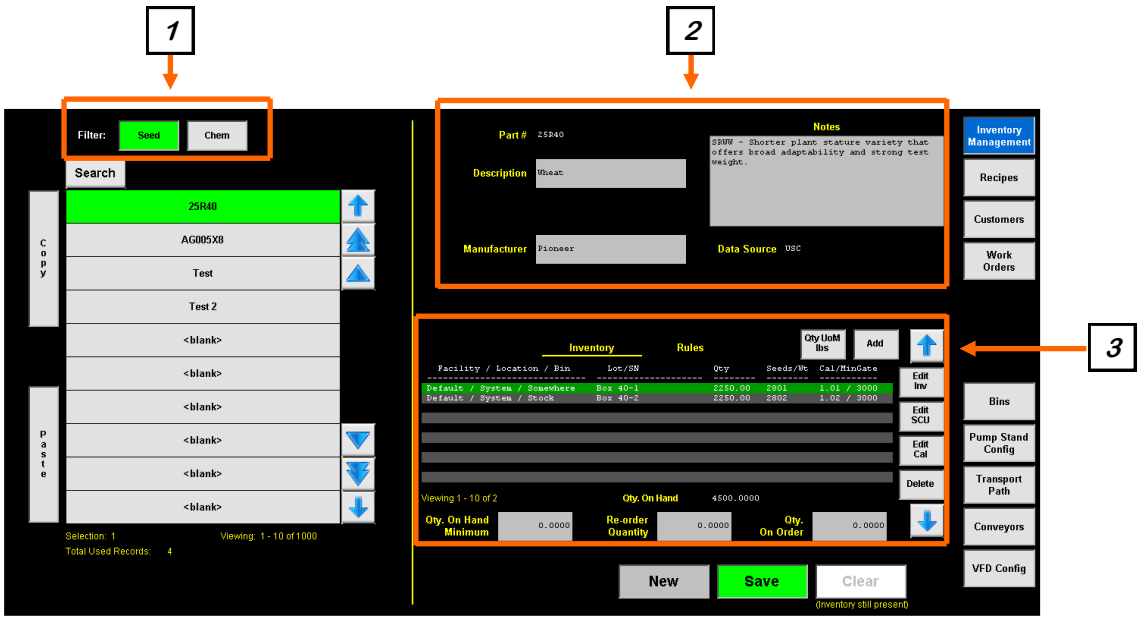
1. RECORD NAVIGATION: This section provides navigation through a list of data records, often also offering a search feature, copy/paste, up/down, pg-up/pg-down, top/end and sometimes some extra features as needed. A selected record's entire contents are available for viewing, editing and deletion to the right of this record list.

2. DATA EDITING: This section is where you view, edit or delete a selected record. You'll see at the bottom buttons like New, Save, Clear or Delete. These buttons vary depending on the nature of the data you are working with.

3. CATEGORY NAVIGATION: This section provides navigation between all the various kinds of data. The top half are process-oriented, organized from most significant to least , top-down. The bottom half are hardware-related configuration items.

DATA EDITING: INVENTORY MANAGEMENT

Inventory Management is a new and more robust approach to tracking your seed and chemicals/ingredients. It is designed after common business ERP data systems. It provides the ability to track as many items or "quantity" objects as you would like in the form of part numbers and unique lot, serial or batch number identifiers.



1. FILTER: This allows you to shrink the list of inventory records to just seed or just chemicals (ingredients).

2. MASTER RECORD (DEFINITION): This section is the master record, or definition, of a given part number. If your system's User Interface Model is set to Basic, you will see less fields in this area than shown above; the above shows Advanced mode. Chemical records additionally provide an indicator of "Wet" or "Dry". This accommodates dry powders now assignable to the Aux port and thus show up on reports.

3. DETAILS AREA: This section provides a lot of features - Inventory Quantity Objects with unique Lot/SN/Batch numbers, SCU Metrics, Calibration Editing and Rules/Attributes (miscellaneous properties and rules associated with the part number). It allows you to define as many unique inventory objects to track as you would like for this part number. The Lot/SN field is what makes these records unique and they are related to the master record via the part number itself. How you make use of this is up to you. If you don't want to track anything in great detail, just declare one entry to track everything for that part number. If you want to track things in detail, put entries in for each seed box, or bag, or per unique batch number or per seed bin (seed bin quantities do need to be independent and unique per bin). SCU Metrics provide seed measurements if you're going to use SCU features. Calibration Editing allows tuning your hardware to specific products. Again, not every item in this section in the above image will necessarily show up on your screen depending on your system configuration.

NOTE: The New button begins creation of a record of the current filter selection type.

DATA EDITING: INVENTORY MANAGEMENT - BASIC/ADVANCED, LOCATIONS

User Interface Model "Advanced"

User Interface Model "Basic"

Above, you can see the difference between running in Basic vs. Advanced mode. The default mode is "Basic". Most people will probably not be interested in Advanced mode, but if you have a large facility and want to track everything or like having more details available, you may want to consider using it.

1. Full advanced location tracking unfolds into 3 layers from most significant to least - Facility, Location and Bin (like a bin on an inventory shelf). Facility would obviously be for tracking inventory across multiple sites (ex. separate mailing addresses). Location would be some general place at your facility, perhaps a particular corner or section of a particular building. How you break this down is up to you. Bin would be the most specific and local component of the location tracking path.

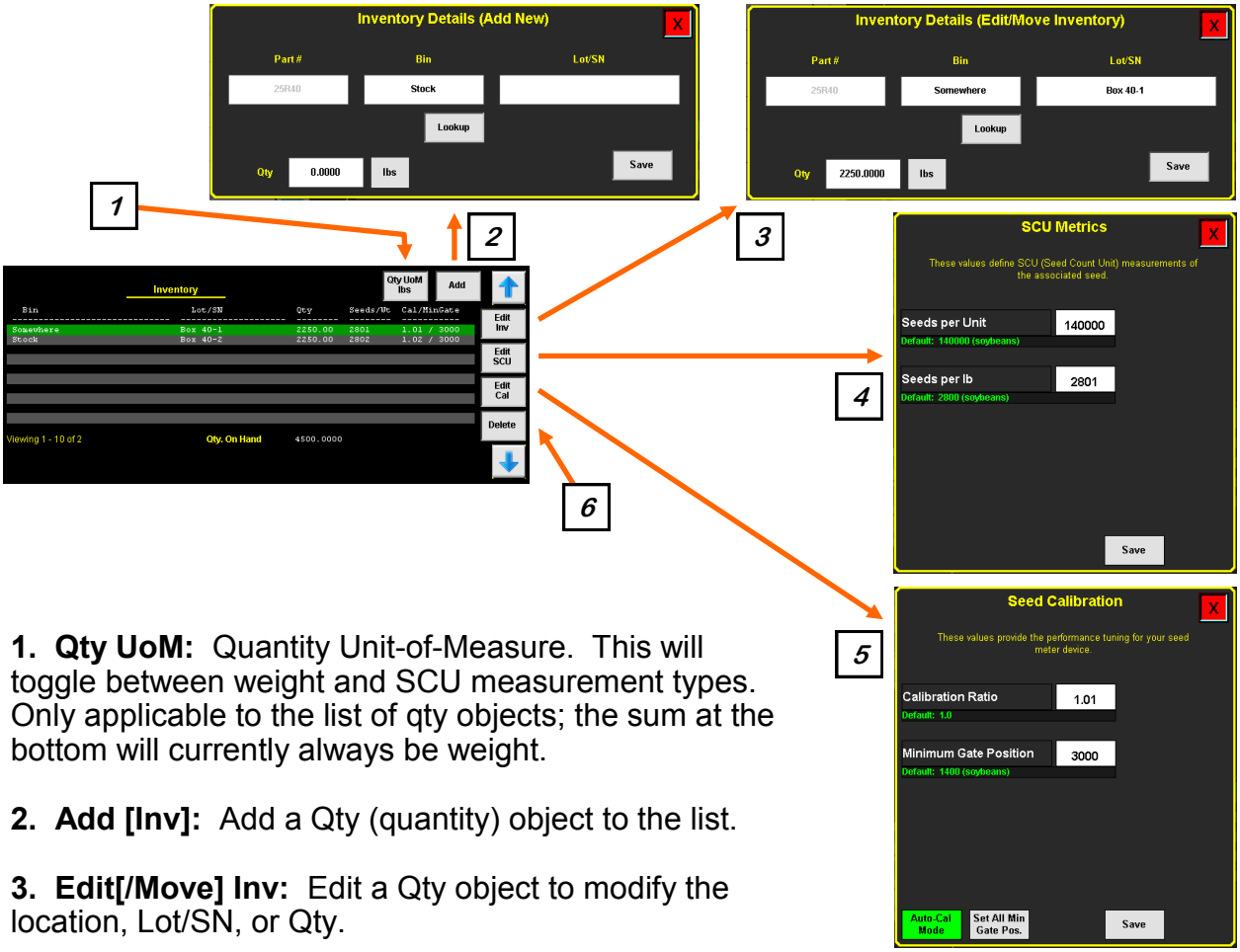
2. Basic mode only operates flatly with the Bin component.

Various components of your treater and even all of your seed bins in v5 are actually systematic inventory locations now. Your system is always defaulted as Facility = Default, Location = System. This is configurable as well in case you have multiple treaters. After Fac / Loc, individual equipment throughout your treater and/or bin site system are then identified with pre-determined Bin values as follows...

ManualHopper1	Pump1
Bin1	Pump2
Bin2	…
…	Pump12
Bin20	Aux
ManualHopper2	Stock

Note: "Stock" is a magical place for inventory that is NOT currently located somewhere within your machine or bin site. It will always be offered to you everywhere, but you can also create as many unique, real places as you like.

DATA EDITING: INVENTORY MANAGEMENT - SETTINGS/PROPERTIES



1. Qty UoM: Quantity Unit-of-Measure. This will toggle between weight and SCU measurement types. Only applicable to the list of qty objects; the sum at the bottom will currently always be weight.

2. Add [Inv]: Add a Qty (quantity) object to the list.

3. Edit[/Move] Inv: Edit a Qty object to modify the location, Lot/SN, or Qty.

4. SCU Metrics: When using SCU for seed inventory or seed flow rate control, etc., these values are required to define the dimensions of the seed.

5. Seed Calibration: Depending on which seed meter you have, this area varies with what it presents you. These items are for tuning your hardware to a particular type of seed. The above example is for LIW Seed Metering. SMW and WB metering systems offer a calibration calculator. LIW offers Auto-Calibrate, Set All Minimum Gate Positions and Set Maximum Gate Position. WB offers Set All Weigh Belt Calibrations.

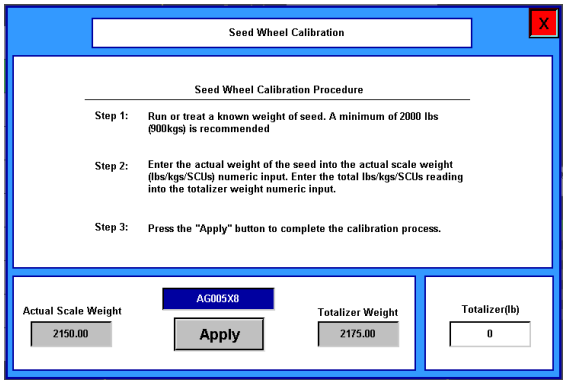
6. Delete: Deletes a Qty object from the list.

Note: When viewing seed part numbers vs. chemical part numbers, what you're presented with in the above details area will be different. The above pictures show what is presented for seed part numbers. Chemicals will present less information.

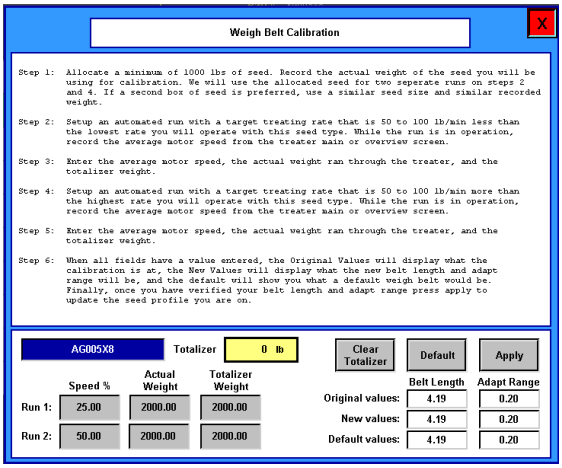
Rule: The master record's part number field cannot be changed once inventory (qty objects) has been added to it, nor can it be deleted until all inventory is deleted.

DATA EDITING: INVENTORY MANAGEMENT - CALIBRATION CALCULATORS

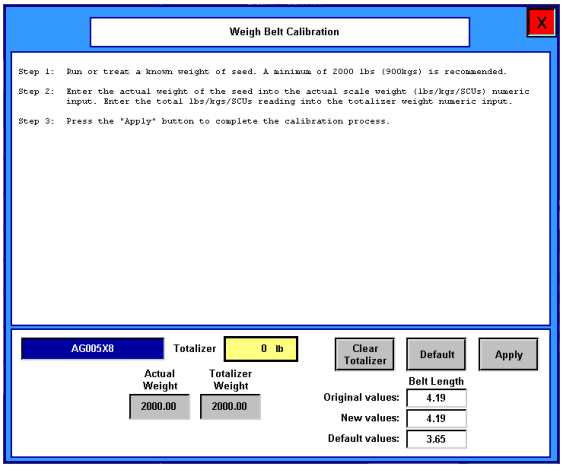
Below are examples of the SMW and WB calibration calculators...



4-load-cell model

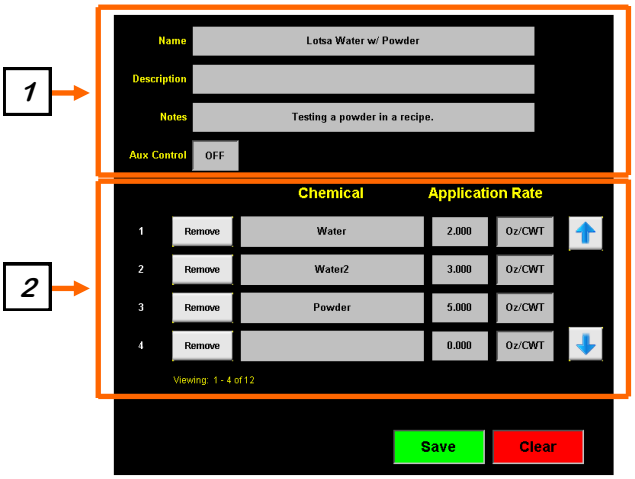


1-load-cell model



DATA EDITING: RECIPES

Recipes define what chemicals/ingredients you wish to apply to your seed and at what rates. In v5, you can now also include dry ingredients in your line items which can be assigned to the Aux port.



1. MASTER RECORD: This section defines the main/master components of the recipe. The Name field needs to be unique. Description and Notes are for your convenience. Aux Control allows you to define if the Aux port needs to operate or not during an automated run regardless of what the Aux port output signal will be used for.

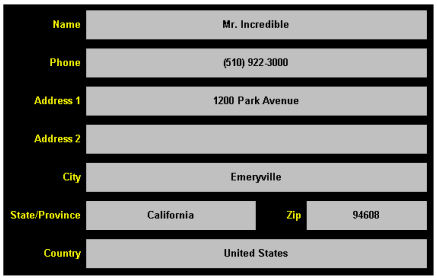
2. RECIPE LINE ITEMS: This section is where you can declare all of the ingredients that need to be applied to the seed and also at what application rate. When you click/tap on each line item's chemical field, it will pop up a selection of chemicals/ingredients available in your inventory.

NOTE: Previous versions of U-Treat (<v5) treated the ingredients list as a 1:1 with the physical pumps. In v5, that is no longer the case. The recipe is now just a recipe and is completely independent from any hardware. Where v5 now requires that you assign inventory objects to your individual pumps and even the Aux port, when you select a recipe in the Start Wizard, the system will now automatically reconcile the demand of the recipe with the inventory resources currently assigned to the individual devices of your system. This makes your recipe completely hardware-independent which lends flexibility to a lot more scenarios.

NOTE: The Aux port can now be triggered for use 2 different ways - Aux Control setting AND/OR a recipe line item can also trigger use of the Aux port if that line item is found to be assigned to the system's Aux port.

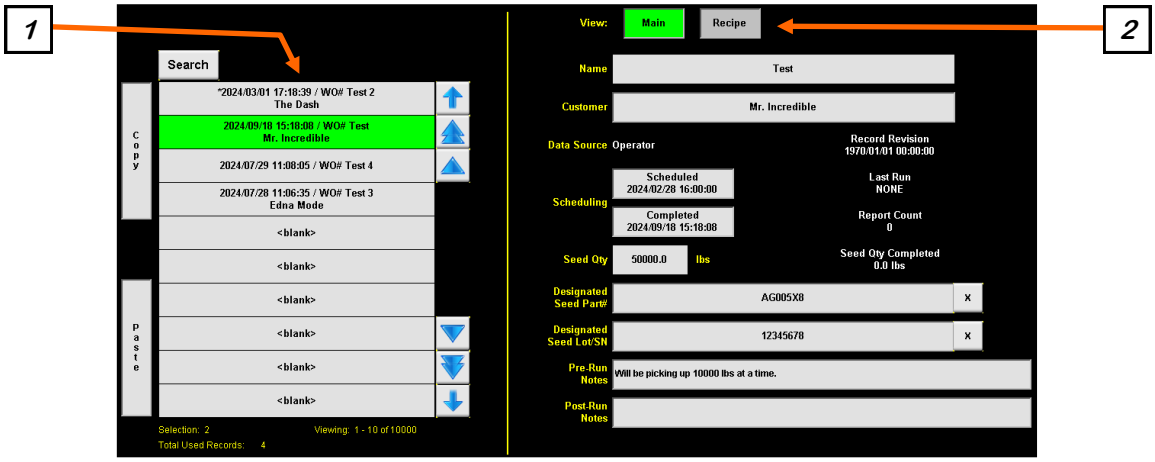
DATA EDITING: CUSTOMERS

A Customer record can be assigned to a run in the Start Wizard so it will show up in a job report indicating the job was for that customer. A Customer can also be assigned to a Work Order which in turn will also be applied to the Start Wizard and thus show up on a job report.



DATA EDITING: WORK ORDERS

Work Orders give you the ability to organize your work load along with your customers' needs. The basic functionality of it is that whatever you fill out in the Work Order is exactly what it will auto-populate the Start Wizard with. Anything you don't fill out will be left available to manually select on the Start Wizard yourself.



1. WORK ORDER LIST: The work order list itself is specially formatted and ordered. The top half of the entire list is everything that hasn't been completed yet with the oldest scheduled time at the top and it will have an asterisk at the front of it. The bottom half is all the completed work orders and it is ordered with the most recent completion date at the top.

2. SECTION TO VIEW: This selector switches between the main record and an attached recipe for the job. The recipe area is identical to the Recipe Editing screen but with one extra button that allows for looking up existing recipes to include in your WO.

SCHEDULING: Setting the scheduled date/time directly affects where the WO will show up in your line-up (in the work order list). If you have a dynamic schedule, you might even change this several times before completing the WO.

SEED QTY: This indicates how much seed needs to be processed. It is currently by weight only.

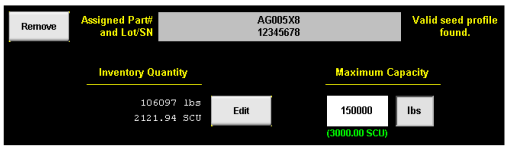
REPORT STATISTICS: This area counts up how many job reports have occurred in service to this WO.

PRE/POST NOTES: The general idea here is that Pre-Run Notes might be for instructions to the operator of the treater and Post-Run Notes might be for making note about how the run went, etc.

DATA EDITING: BINS

Bin Editing is primarily for configuration of your seed bins, however, it also provides inventory management for each bin, which we'll focus on here.

Manual hoppers will not have inventory; just Bins 1 through 20.



The above picture shows the inventory management features.

The top area allows you to remove or assign inventory to the bin.

The indicator on the top-right is just proof that the seed metrics have already been auto -created.

The bottom-left shows the current inventory quantity in two formats and offers editing of that quantity.

The bottom-right allows setting the maximum capacity of the bin itself.

ALARMS / MESSAGES

The navigation button “Alarms” takes you to the Alarms and Messages area.

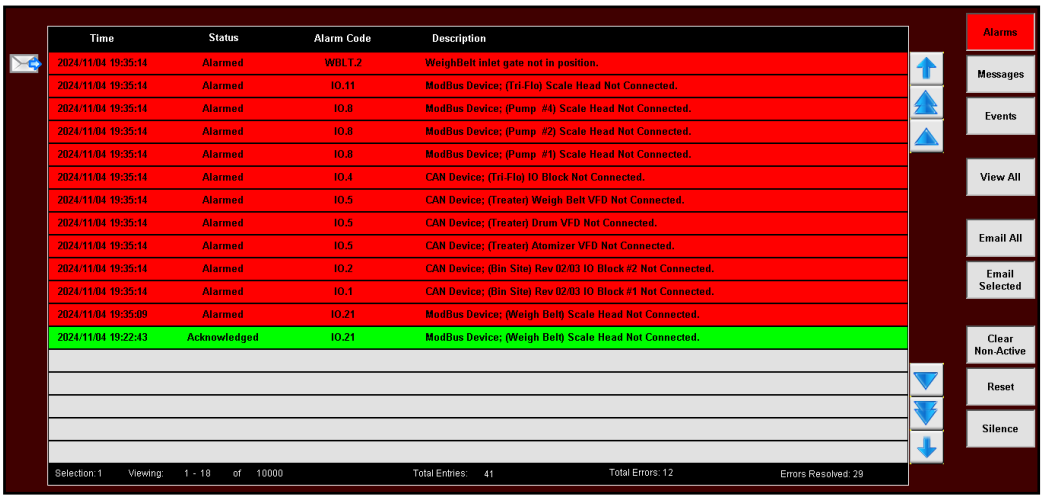
There are 4 states of alarms and messages. 1. The initially alarmed state. 2. Silenced. 3. Acknowledged. 4. Archived. While in state 1, alarms will be red. State 2 will be yellow. State 3 will be green. State 4 will filter archived items out of the list. The View All / Hide All button will switch you between a filtered or unfiltered list based on the State 4 “Archived” condition so you can review or ignore archived records.

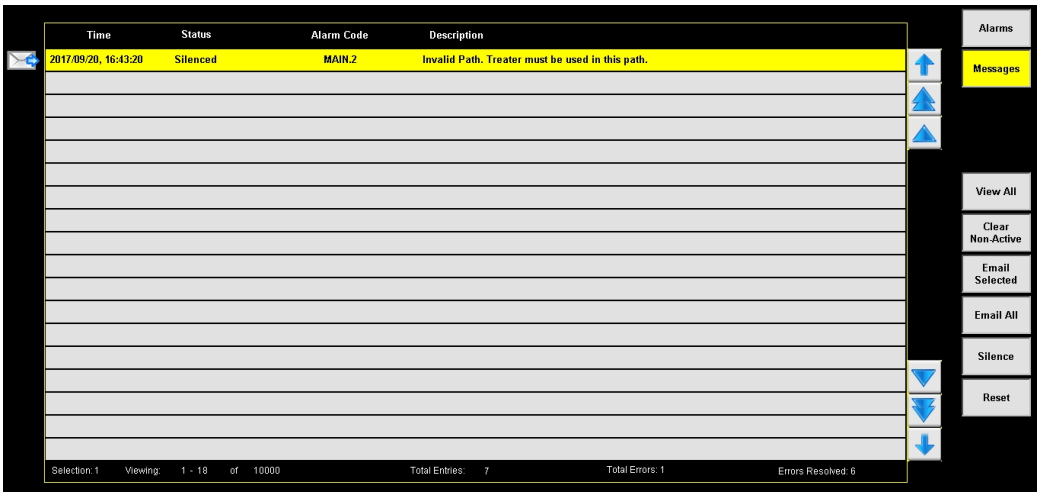
Alarms are problems that will stop your machine from running or will pause an existing automated run that must be corrected before you can run or resume the machine.

Messages are warnings that should be looked into but are not show-stoppers for a new automated run or an existing run.

Events are accessible for the administrator and are for troubleshooting.

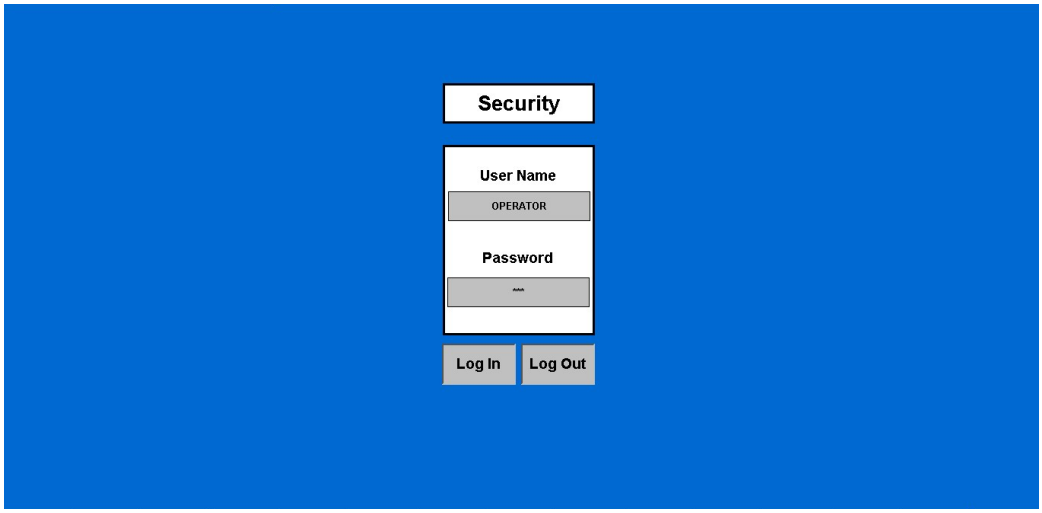
Another option available is emailing a single item or emailing an entire export.





SECURITY

Below is the traditional login page for changing your security level throughout the program. Alternatively, certain pages will also allow you to use the “User:” button in the top-right corner of the screen to change your credentials. This alternative is the second image available below...

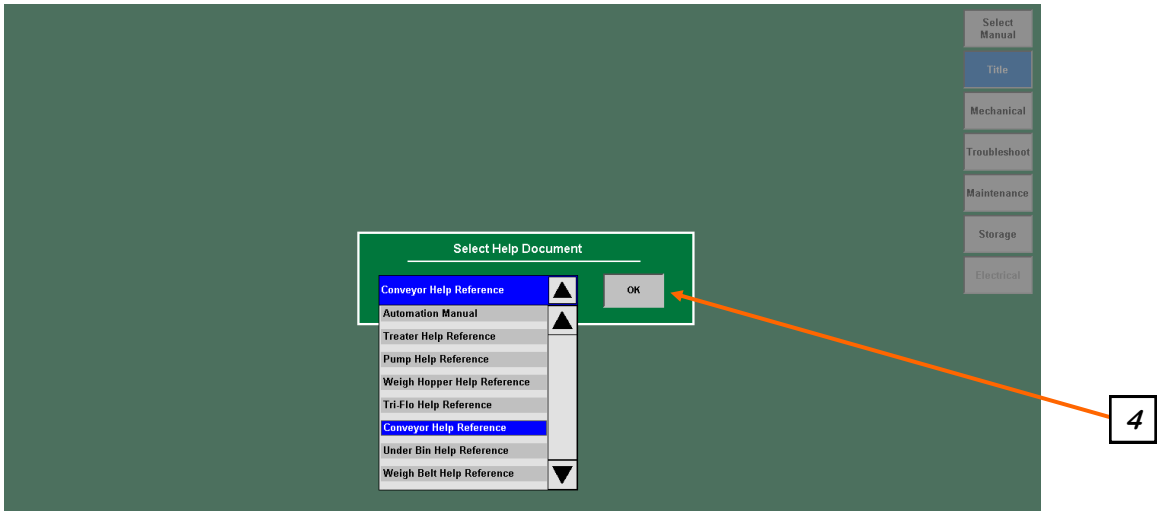


Login credentials are case-insensitive.

The standard login account is “operator” with a password of “usc” and this information should only be made available to personnel qualified and authorized to operate the machine.

HELP SCREEN

The following pages explain how to navigate through the Help screen functions. Once you leave the Help screen, resets to the title page of the Automation help document.



1. SELECT MANUAL: Pressing this button will bring up the Select Help Document drop down menu.

2. TITLE: Pressing this button will take you to the title page of the active document. The image may be scaled by using the PDF reader function bar hidden at the bottom of the screen, or dragging a square with your fingers.

3. HELP SECTIONS: Pressing these buttons will take the operator to specific sections of the help document.

4. SELECT HELP DOCUMENT: When the Select Manual button is active this popup module appears. Select the arrow and the drop down list will open. Choose the title of the document for viewing and then the OK button.

CALIBRATION

SECTION D

DETERMINING SEED CUP WEIGHT FOR SEED WHEELS

The following is a list of steps to use when calibrating the seed wheel. A seed calibration cup, funnel, stand, and scale are used to calibrate the seed wheel.

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 (see next page, 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.
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 (see next page, figure 1).
5. After the cup has been filled, strike off the top of the calibration cup with a straight edge (see next page, figure 2).

Seed Calibration Cup

NOTICE Do not shake the cup.

AVIS Ne secouez pas la tasse.

6. Weigh the sample of seed (see next page, 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.

AVIS Un poids typique de l'échantillon de semences sera ne importe où entre 2,8 à 4,0 livres. Tout sur ou sous cette fourchette pourrait être causée par la réduction à zéro ne pas le poids de la tasse, ou la balance peut être réglé sur les mauvaises unités.

DETERMINING SEED CUP WEIGHT FOR SEED WHEELS

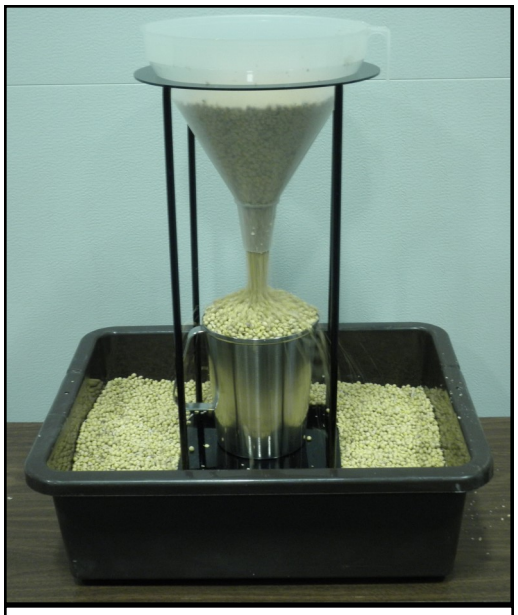


Figure 1

Figure 2

Figure 3

NOTICE

When U-Treat is being used to run a Bayer RH series treater, use the cup and scale provided with that treater to measure the cup weight. The RH scale measures in grams not pounds.

AVIS

Lorsque U-Treat est utilisé pour exécuter une série treater Bayer RH, utilisez la tasse et échelle fournie avec ce purificateur pour mesurer le poids de la tasse. Les mesures à l'échelle de SR dans grammes non livres.

SEED FLOW CALIBRATION: SEED WHEELS

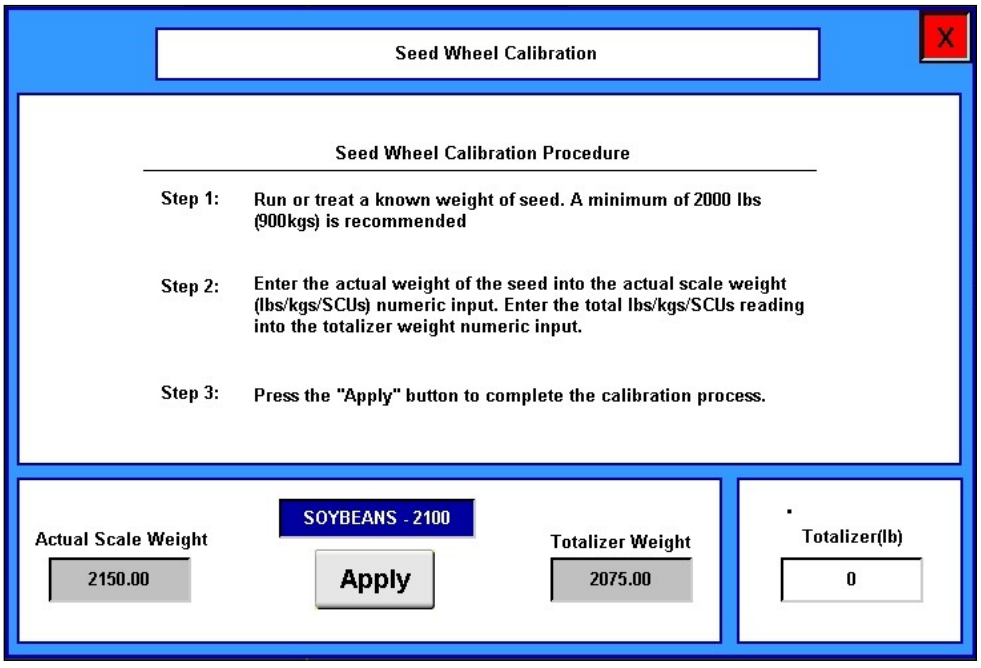
For a seed wheel, there are two ways to affect the seed flow accuracy - Cup Weight and/or Calibration Ratio. If you are operating your seed wheel with the Cup Weight feature enabled, you may enter the cup weight value in a couple different places. One is in Inventory Management via the Edit Cal button. The other is in the Start Wizard via the Quick Edit button by the Seed line item. If you are also going to use Calibration Ratio, be sure to enter your Cup Weight first before continuing with the Calibration Ratio steps below.

If you're using Calibration Ratio or fine-tuning with it, use the following instructions...

1. In Utilities, make sure Auto Rate Adjust to Bin Site box is **NOT** checked.

2. In the Start Wizard, make sure you are not using SCU targeting for the seed flow rate and then set your desired weight per minute rate.

3. Perform an automated run, or even treat, a minimum of 2000 pounds of seed of verified weight. When the system shuts down, go to the Calibration Calculator, enter in the actual seed weight and also the totalizer weight and then hit Apply and it will update your Calibration Ratio value.



SEED FLOW CALIBRATION: LIW

For a Loss-In-Weight seed meter, there are 5 settings to be aware of. The typical calibration values (first 2 listed below) can be configured in two places - Inventory Management —> Edit Cal ...or… in Start Wizard —> Seed Line Item's Quick Edit button. The lesser items 3 and 4 are only available in Inventory Management. The 5th is a hardware control setting in Utilities —> Dyadic Parameters.

If you're using Calibration Ratio or fine-tuning with it, use the following instructions...

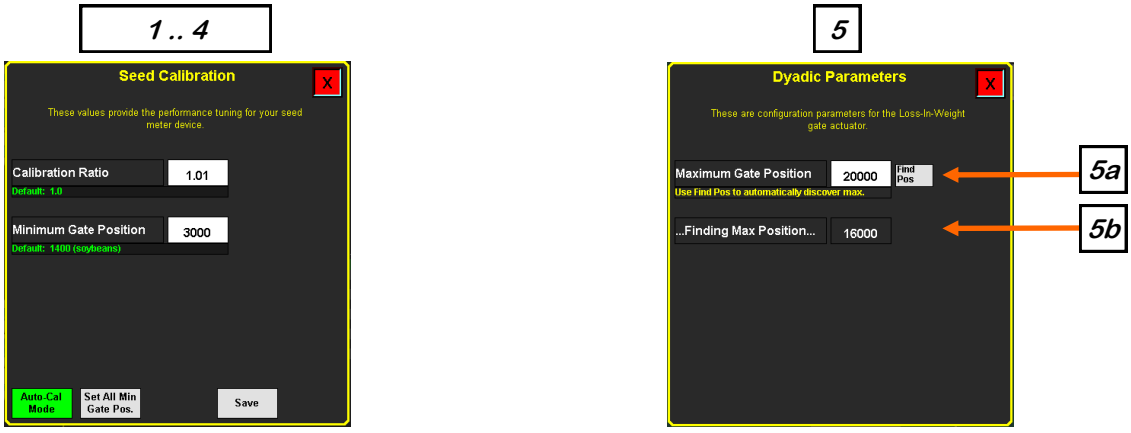
1. Calibration Ratio: This value is used to make more precise initial gate openings per the target flow rate. Once a live seed flow has established a solid flow rate, further adjustments to the gate position are done based on live flow rate data. If Auto-Cal Mode is enabled, when the first live flow rate calculation occurs, the Calibration Ratio is automatically adjusted so on the next run it will start out even more precise.

2. Minimum Gate Position: This value is the minimum gate position necessary to produce seed flow. Different types and sizes of seed will affect this significantly. The precision of this value becomes most important when trying to hit very low flow rates. It also has some affect on the effectiveness of Calibration Ratio.

3. Auto-Cal Mode: This mode setting determines if the Calibration Ratio will be automatically adjusted or not during automated runs.

4. Set All Minimum Gate Positions: This function will apply the Minimum Gate Position value of your current record to all other records in the system.

5. Set Max Gate Position: This hardware control setting allows the gate control code to know exactly where the end of the gate's full-open stroke ends. Having this properly set will help avoid slamming the gate against the full-open dead-end which will greatly extend the life of your actuator. It also provides an automatic Find Position function (**5a**). To use it, you must have no seed at the entrance of the LIW gate. When activated, an additional line will appear temporarily giving you status on the function (**5b**).



SEED FLOW CALIBRATION: WEIGH BELT

There are two models of USC weigh belt for seed metering. There is a 4-load-cell model (earlier model 2016 - 2019) and a 1-load-cell model (current model 2020 - present). Both models have differences in calibration methods, the newer one being much simpler to perform and it also has far wider applications of a single calibration, ie. one calibration is typically good for an entire seed type (ex. soybeans).

Calibration generally works just like a Seed Metering Wheel. You just need to run a known weight through the weigh belt and see what it totalizes. The actual weight and totalized weight can then be entered into the calibration calculator to produce an updated calibration for a given product.

The newer model usually only needs this done once with these two values. The older model requires two different runs and both runs need to be at significantly different speeds and those speeds have to also be entered into the calibration calculator. Also, while the newer/current model only has one calibration value (Belt Length), the older model uses 2 calibration values (Belt Length and Adapt Range).

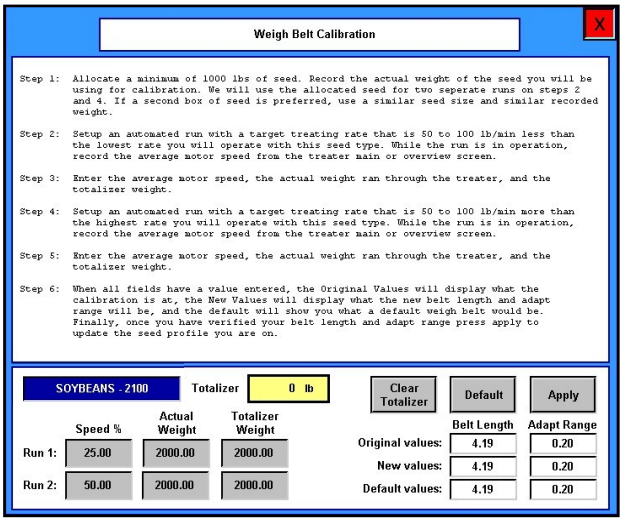
The two different calibration calculators are displayed below which contain their own instructions. Before using those instructions, also do the following...

1. In Utilities, make sure Auto Rate Adjust to Bin Site box is **NOT** checked.

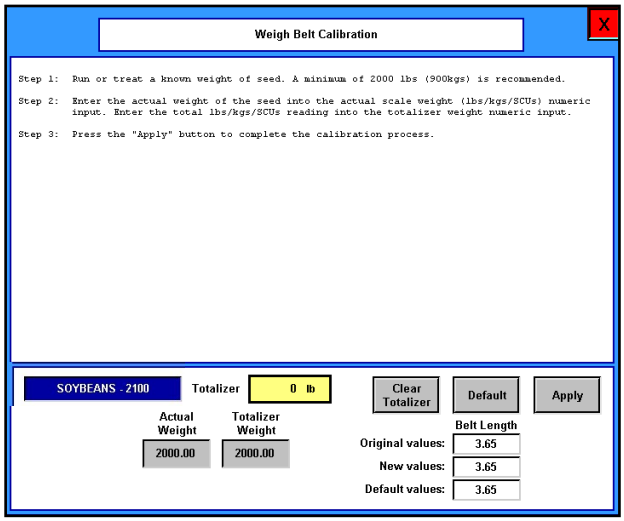
2. In the Start Wizard, make sure you are not using SCU targeting for the seed flow rate and then set your desired weight per minute rate.

3. Perform the procedures provided by your system's particular calibration calculator.

4-load-cell model



1-load-cell model



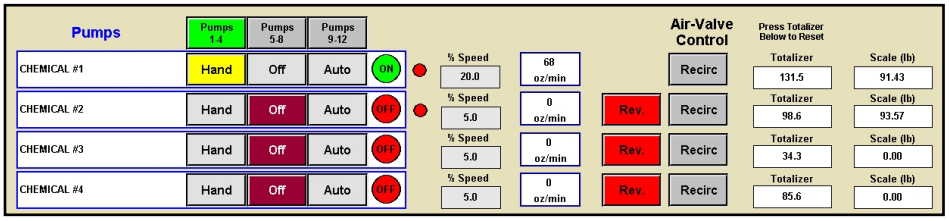
PUMP CALIBRATION

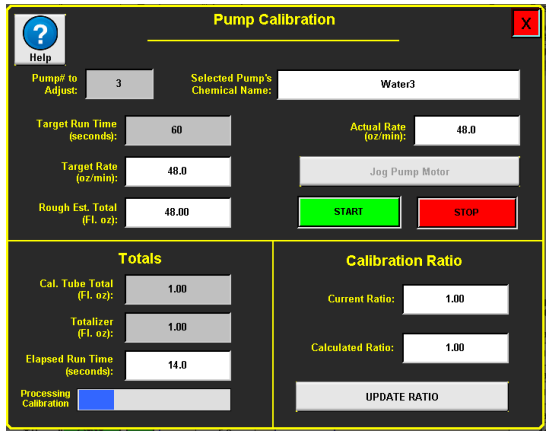
Not all chemicals/ingredients are alike. In fact, they can have quite varying performance characteristics going through the pumps, the flow measurement mechanisms and associated apparatuses. Because of this, calibration techniques are necessary to attain maximum application accuracy.

NOTE: USC makes a wide array of pumps and pump options, so the following instructions may vary to some degree based on your particular equipment.

NOTE: Flow meter pumps calibrate to a value called Calibration Ratio which adjusts the accuracy of the flow meter reading for the specific ingredient.

NOTE: Loss-In-Weight pumps use a weigh scale to judge flow rate and totalizing. They have 2 points of calibration. **1.** A calibration ratio is typically automatically updated each time a pump runs in Auto after it gathers its first bit of live data. This value makes the pump's next startup more accurate right off the starting line. Generally, very little ever has to be done to this value, however, if something goes wrong and it gets too far out of line, you can always set it back to the default 1.0 and let it re-adjust itself back into a good place. **2.** The other calibration point is the density of the ingredient. All recipe targeting is done via volumetric measurements, therefore density needs to be known in order to translate weight (or mass) into volume. *The Pump Calibration popup can be used for either of these 2 purposes.* Each time you do a calibration with this tool, the Calibration Ratio will automatically update itself. Generally, one or two runs will get this number into a good spot. For density, most product makers provide this value, but if not, this tool can also help you find the product density.





Pump Controls

Pump Calibration Tool

(See instructions on the next page)

PUMP CALIBRATION

Calibration instructions...

1. Fill the appropriate pump with the ingredient or slurry that is going to be used for this calibration.

2. Use the Pump Assignment popup to assign the product to the appropriate pump.

3. Make sure your pump is currently configured for recirculation.

4. On the Treater HOA screen, turn the corresponding pump to Hand and set the speed to 20 percent or higher. Let the system run in recirculation mode for 15 minutes to remove any air from the system. Now set the pump to Auto.

5. If the pump has a calibration tube, reconfigure the pump to deliver to it. If you don't have one, you should have valving that supports delivery to a separate vessel.

6. On the Pump Calibration popup, select the appropriate pump. Use the Jog option to prime fluid to your calibration tube's "0" mark or to your separate catch vessel.

7. On Treater HOA screen, press the totalizer object to zero the totalizer.

8. On the Pump Calibration popup, set the Target Run Time preferably to 60 seconds or more, then press Start to begin the process.

9. When the process completes, the Calibration Tube Total and Totalizer fields will be automatically populated with the totalized amount.

10. Read the amount in the calibration tube or separate catch vessel and enter that volumetric amount into the "Cal. Tube Total" field. You'll see new results on the right side of the popup. If you want to accept/apply the new results, hit the UPDATE RATIO button (for Flow Meter pumps) or the Update Density button (for LIW pumps). If you're only running this tool to update the Calibration Ratio for an LIW pump, then you do not have to do anything else after the routine ends.

201 SCALE HEAD CALIBRATION

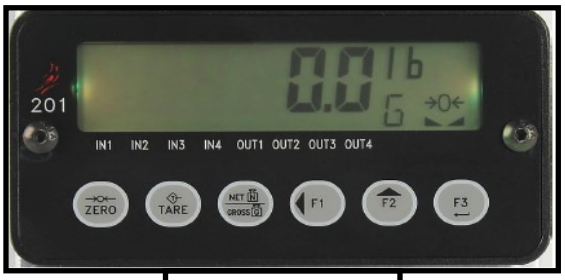
ELECTROCUTION HAZARD

Extra caution must be exercised when working inside the control panel when it is powered.

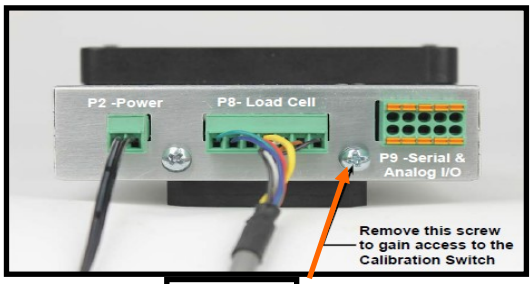
DANGEROUS VOLTAGES ARE PRESENT

The load cell calibration needs to be checked periodically, especially after moving the equipment. Use the steps below for proper load cell calibration.

1. Ensure the machine is placed on level ground, scale transport braces are removed, and the load cell(s) are mounted in a non-binding fashion.
2. Place a known weight (minimum 100 lbs. recommended) distributed evenly on the scale.
3. Go to the main screen on the control panel. The “Scale Wt.” on the main screen will display a weight.
4. If the screen shows the correct weight, remove the weights and store. If the screen does not show the correct weight, go to step 5 and re-calibrate the load cell. For single load cell weigh belts, the weight on the screen will be 2x what the 201 indicator is displaying.
5. Remove weights from the scale. With the control panel powered on, unlock and open the door.
6. Remove the calibration screw on the scale indicator to gain access to the calibration switch.



Face of unit



Step 6

LOAD CELL CALIBRATION (CONTINUED)

7. Press and hold the calibration switch through the opening from the removal of the screw in the prior step for approximately 2 seconds until the display changes to SEtUP. This is best done with a small tool.(e.g. a 3/32 or 2mm Hex Key Wrench or small screwdriver.)
8. Release the calibration switch to begin setup.
9. Press the F2/▲ key to step until the display shows CAL.
10. With CAL = displayed, press the F3/← key. The display will change to CAL=. Proceed to the CAL= (Perfom Calibration) parameter.
11. With CAL= displayed, press the F3/← key. The display will change to no.
12. Press the F2/▲ key to toggle to YES and then press the F3/← key. The display will change to CAL 1=. Proceed to the CAL 1= parameter.
13. The display will show CAL 1 =. This is the first of two calibration weights. This weight is ZERO (NO LOAD).
14. Press the F3/← key to view the current setting.
15. Press the F3/← key again to set absolute zero.
16. Starting at the left and proceeding right, a series of dashes will appear and then disappear. Then the display will show CAL 2=.
17. This is the second of two calibration weights. This weight is with the recommended 100 lb. test weights or other known weight.
18. Press the F3/← key to view the current setting.
19. Use the F1/◄ and F2/▲ to input the value of the test weights. The display must read 0100.00, (it must match the known weight used for calibration).
20. Place two 50lb. weights on the scale platform, wait for the weight to stabilize on the scale indicator, then press the F3/← key.
21. Starting at the left and proceeding right, a series of dashes will appear and then disappear. Then the display will show F SPAn.
22. The calibration process is now complete. Press F1/◄ until you are returned to the starting screen.
23. Replace the screw removed in step 6.
24. Close and lock the control panel.
25. Remove and store the weights .

BIN SITE CALIBRATION

Bin Sites can currently include up to 20 seed bins, 2 manual hoppers, 16 conveyors and it also includes 1 of several weighing apparatus options. The two most common weighing options are various sizes of weigh hopper or the continuous-flow USC Tri-Flo.

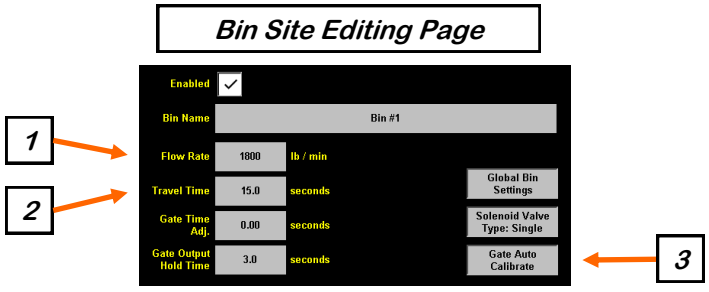
The primary means of calibrating a Bin Site are with 2 particular values - Flow Rate **(1)** and Travel Time **(2)**. These parameters are stored for each Bin. Calibration only applies to Bins; there is nothing to calibrate for Manual Hoppers as seed is delivered from them manually by the operator and U-Treat has no idea when that seed is going to show up or how fast it will be flowing.

As long as the Gate Auto Calibrate **(3)** feature is enabled (which is the default) and the conditions are favorable during automated runs involving the Bin of interest, these two parameters will automatically update themselves. There must be no pause or alarm event during an automated run and a sufficient quantity delivered in order for new measurements to be automatically stored for this Bin.

To achieve a new Flow Rate **(1)** measurement, enough seed needs called out of the Bin to fill the inlet conveyors and also put approximately 500 lbs into the weigh device and also while the Bin gate is still open. For this reason it is generally recommended to call for approximately 2000 lbs or more to achieve this calibration.

To achieve a new Travel Time **(2)** measurement, enough seed needs called out of the Bin to fill the inlet conveyors and also get a few lbs into the weigh device all while the Bin gate is still open. The amount of seed required will depend on how great the distance is between the Bin gate and the weigh device. This could be 500 to 1000 lbs on average, but this can vary quite a lot per site. If you're doing a large enough quantity to achieve the Flow Rate measurement, then you'll easily achieve the Travel Time measurement.

If either of the 2 calibration values get way off or you lose confidence in them, set them back to the default values of 1800 lbs/min and 15 seconds and let it hone back into place on the next run.



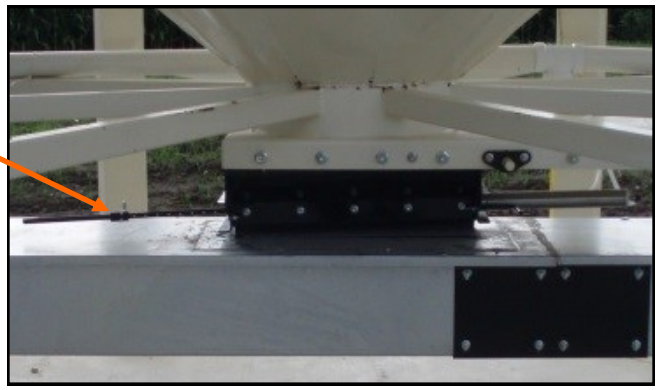
BIN SITE CALIBRATION: BIN SLIDE GATE (AIR)

The following is a list of steps for setting each Bin's seed flow rate for air-powered gates. This must be completed before running the 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 throughout the entire season. If this gate is adjusted during a run or between runs then it will affect the calibration of the system and the system will need to be re-calibrated.
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 pin to lock the collar in place. If the stop is adjusted between runs then it will affect the calibration of the system and the system will need to be re-calibrated.

NOTE: 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. Also, when starting this process, it is recommended to start at 2.5 holes open for an approximate 1000 lbs/min for soybeans and that is if it is the newer 8" gate. Older gates are 4" and may not produce as much flow per hole setting. Each additional hole may produce approximately 200 lbs/min of influence on your overall flow rate, but remember that different seed types will likely produce different results.

Move the position of the collar along this rod to adjust the flow of seed through the bin slide gate.



OPERATION

SECTION E

CHECKLIST

Once you get to a point where you think you are ready to operate your machine, run through the following checklist which should cover most scenarios…

1. If you have a Bin Site, make sure your bins have been filled, the appropriate inventory record for each bin has been assigned to the bin and its quantity is up to date. Make sure your weigh device has been properly calibrated. Make sure your conveyor belts are all tracking properly.

2. If you have a Treater, make sure the pumps are outfitted with the correct ingredients, that they have appropriate inventory assigned to each of them (ie. Pump Assignment popup) and that their inventory quantities are accurate. Make sure any pump manual valves are set to deliver fluid to the Treater Atomizer. Make sure all fluids are primed up to the Atomizer. Make sure Flow Meter pumps have been calibrated to the ingredient on that pump. Make sure LIW pump scales have been properly calibrated and that the system knows the correct density of the ingredient.

3. If you have a Treater with auxiliary equipment attached to the Aux port and you intend to use that equipment, prepare the equipment as needed and then test communication between U-Treat and the auxiliary equipment via the Aux HOA on the Treater HOA screen.

4. If your system requires air (Bin Sites usually do and also some pumps and most gates and diverters), make sure your air compressor is on and up to proper pressure and the air is being delivered to your equipment.

5. Make sure all equipment is powered on, the E-Stop is clear and there are no active Alarms.

6. On the Treater HOA page or the Bin Site HOA page, use the Auto All Devices button to prepare your equipment for use.

7. If you have a Treater, on the Treater HOA page make sure your Drum, Atomizer and optional Nebulizer have their speeds properly set. Drums and Atomizers are usually operated at 100%.

OPERATION

There are several things that will affect how your system operates. Below are a general set of instructions to perform an automated run. Organization begins with the Start Setup wizard but then is generally ordered via seed source to seed destination...

1. Go to the Data View screen or the Overview screen and use the Start Setup wizard to set your automated run parameters. Once satisfied, press the Start button. Equipment will generally start up from the tail end of the seed travel path and work its way to the beginning of the seed travel path. (Equipment is started up in a timed sequence in order to avoid massive power surging.)

2. If you have a Bin Site and are calling seed from a Bin, after the entire conveyance path is up and running and the inlet portion has been running for 1.5 times the Travel Time of the Bin you are calling seed from, the Bin will begin delivering seed. When the weigh device has determined the appropriate amount of seed is enroute, it will tell the Bin to close its gate. Once the weigh device has weighed the seed, it will begin to discharge the seed. If you have a legal-for-trade weigh hopper or USC Tri-Flo, a ticket printer will regularly print out its various weighments.

3. If you have a Bin Site and no Treater and the target quantity has been delivered from a Bin, the system will automatically shut itself down and then generate a report. If a Manual Hopper is the source, the system will indefinitely sit in a waiting state of “see seed, weigh seed”. When you are finished, you will need to hit the Shutdown button on the Data View or Overview screen.

4. If you have a Treater without a Bin Site, the Treater will sit in a waiting state of “see seed, treat seed”. When you are finished treating seed, you will need to hit the Shutdown button on the Data View or Overview screen.

5. If you have a Bin Site and Treater, as soon as the Treater sees seed being delivered to it by the weigh device, it will begin treating the seed. Once it is detected that there is no more seed to treat, the seed meter will shut off, pumps will stop delivering fluids, the Aux port will turn off (if it is being used) and a shutdown timer for the drum will begin its count down (default is 60 seconds; LPV’s with drum-tilt option can often operate at 45 seconds). Once the drum timer is complete, drum and all other operations of the Treater will cease, or if more weight is still expected from the Bin Site, it will instead enter a waiting state until it sees more seed arrive.

6. Once all seed has been processed, any outlet conveyors will now begin their shutdown timings as they clear out any remaining seed. They will be the last equipment to turn off.

7. If it hasn’t occurred already at this point, a job report will be generated and stored. If the system is configured to do so, a job report will be printed and/or emailed.

OPERATION: NOTES

As you continue to tune your system's behavior and performance, be aware of the following things…

Flow Rates: The seed flow rate of a Bin Site needs to be fairly close to the seed flow rate of a Treater and the pumps of a Treater need to be able to adequately hit the flow rates necessary to accommodate the Treater's seed flow rate. To help with this balance, in the Start Setup Wizard is a tool called Dependency Check. It will list out all the target speeds your various devices are going to try to achieve and it will also list theoretical minimums and maximums for each device so you can see where you might have bottlenecks in the system. Generally, a Treater should run within 95 - 98% the rate of a delivering Bin Site. Pump motors should generally be running between 20 - 80% of their speed range. If you get too close to the upper or lower ends, a given pump may fail to hit its target rate and it will alarm the system and pause everything.

Delay Timers: Many of the devices throughout the system have delay timer settings, typically in seconds. There are usually both a start delay timer and a stop delay timer. This allows you to tweak the timings of when all the various devices start and stop in relation to one another. For instance, if the chemicals/ingredients start applying themselves too soon, you can apply a start delay time value to combat that problem. If the pumps aren't staying on long enough at the end of the run, you can apply a stop delay timer to make them run a little longer at the end.

When Pumps Engage/Disengage: Pumps decide to turn on or off based on a seed proximity sensor normally positioned at the entrance to your seed meter.

Weigh Device On The Ground w/ Treater: If your weigh device is on the ground rather than stacked over your Treater, you'll have a conveyor in the mix to transfer seed from the weigh device to the Treater. Things play out differently depending on the seed meter employed. **SMW:** Conveyor will fill a hopper over the Treater's SMW until a high-level seed proximity sensor detects the hopper is full. Once this high-level sensor turns back off, a timer then counts down (default 4 seconds) and once complete the conveyor turns back on. **LIW:** The LIW gate is usually underneath the weigh device and the conveyor will run the entire time. **WB:** The WB is usually underneath the weigh device and the conveyor will run the entire time. **LIW & WB NOTE:** Due to the added distance from the Treater, pumps will require good use of their start delay timers.

Accuracy: Pumps can totally hit the mark but still show up on a job report as having over-applied or under-applied ingredients. This can be caused by the seed meter not being accurate (ex. SMW not properly calibrated; ex. LIW seed meter gets off to a bad start) which then results in the pumps running longer or shorter than they should have, even though they are running at the correct speed. Another more minor influencer of accuracy can be how you use all of the start/stop delay timers. Pumps might have no start delay timer, but might have a 3 to 5 second stop delay timer. The pump is going to purposely apply extra ingredient for those few seconds.

OPERATION: UNDERBIN IN REVERSE MODE

The following is a list of steps to use when running the underbin conveyor in Reverse mode. This mode of operation will allow the operator to clean out the underbin conveyor and 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 option for the underbin conveyor will only be present if the controls for this feature have been installed.

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.

2. Press the Bin Site HOA 1 button. The underbin conveyor needs to be in the OFF mode. Press the Reverse button to the right of the underbin conveyor. Ensure that the belt on the underbin conveyor is correctly aligned.

3. Place the Gate Control module in the Hand mode. Press the bin slide gate Open button on the bin you wish to cleanout.

4. The Data View and Overview screens will show the underbin conveyor on and the bin slide gate in the open position.

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 remain running for at least 15 more seconds. This will allow the conveyor to clean itself out. When the conveyor is empty, place the motor in the Off position.

SECTION F TROUBLESHOOTING & ALARMS

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 USC.

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 button is pressed. The horn is silenced by pressing the Silence button on the alarm screen. The arrows on the right allow the operator to scroll through the listing. For further assistance, contact USC.

TREATER TROUBLESHOOTING

SECTION F-1

TREATER TROUBLESHOOTING

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. Overload is tripped. 4. 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 (see page Proximity Sensor Adjustment Guide). 3. Reset inlet conveyor overload. 4. Check to make sure the inlet conveyor is plugged into the
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. Adjust the pump proximity switch sensitivity by turning adjustment screw counter-clockwise (see page Proximity Sensor Adjustment Guide).
Pump will not turn on in AUTO	1. Proximity switch is not staying covered. 2. Atomizer is not on. 3. Proximity switch is not sensitive enough. 4. Both the Chemical Pump switch on the Pump Stand and the Pump/Aux Control on the HMI screen need to be set to AUTO.	1. Make sure proximity switch is staying covered with seed 2. Turn on atomizer. Atomizer must be on to run the pump in Auto. 3. Adjust pump proximity switch sensitivity by turning the adjustment screw clockwise (see page Proximity Sensor Adjustment Guide). 4. Set both the Pump Stand switch and Pump/Aux on the HOA screen to AUTO.
Inlet conveyor will not shut off when 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. 4. Hopper proximity switch is not connected	1. Make sure seed is hitting proximity switch. 2. Adjust the inlet conveyor proximity switch by turning the adjustment screw clockwise (see page Proximity Sensor Adjustment Guide). 3. Make sure inlet conveyor is plugged inlet conveyor receptacle. 4. Connect hopper proximity switch.

TREATER TROUBLESHOOTING

Problem	Possible Cause	Solution
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.
Seed calibration is fluctuating.	1. Seed treater supply hopper is not staying full. 2. Restriction in the supply hopper or metering device. 3. Build-up in the atomizing chamber.	1. Make sure the supply hopper and metering device are staying full. May have to lower seed flow rate in order to have a consistent flow of seed. 2. Check supply hopper and metering device 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.

TREATER TROUBLESHOOTING

Problem	Possible Cause	Solution
Seed Gate Actuator will not move.	1. Adjustable Chamber mechanism jammed with debris. 2. One or both of the two connectors linking the actuator to the control panel are not connected.	1. Clear all debris and make sure mechanism moves freely. 2. Make sure both connectors are properly engaged.
Seed Gate Actuator will not return to the closed position after all seed has emptied from the box.	1. Proximity switch is dirty. 2. Proximity switch is set too sensitive. 3. The system is running in HAND mode.	1. Clean proximity switch. 2. Adjust the pump proximity switch sensitivity (see page Proximity Sensor Adjustment Guide). 3. Change to AUTO mode.
Seed Gate Actuator will not move in AUTO.	1. Proximity switch is not staying covered. 2. Proximity switch is not set sensitive enough. 3. HMI screen not set to AUTO.	1. Make sure proximity switch is staying covered with seed. 2. Adjust pump proximity switch sensitivity by turning the adjustment screw clockwise. 3. Set HMI screen to AUTO.
Seed Gate Actuator will not close completely.	1. Debris may be keeping it from closing completely.	1. Open the seed gate, remove debris and power cycle the entire system. When the system is turned back on, the gate will automatically close and find it's Home position.
Drum Actuator not moving and stopping at the correct time.	1. The connector linking the control panel to the actuator is not connected. 2. The Actuator Calibration parameters have not been set or are set incorrectly.	1. Make sure the connector is properly engaged. 2. From the Utilities page, press the Drum Actuator Calibration button and ensure the settings are correct.

TREATER SYSTEM ALARMS - FAULTS

Below is a table describing the most frequent system alarms, faults and solutions with the USC Automated Seed Treater.

For further assistance, contact USC.

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 operation.
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.
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 SYSTEM ALARMS-FAULTS

Alarm - Fault	Possible Cause	Solution
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.
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.

TREATER SYSTEM ALARMS-FAULTS

Alarm - Fault	Possible Cause	Solution
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.

TREATER SYSTEM ALARMS-FAULTS

Alarm - Fault	Possible Cause	Solution
Drum Tilt Actuator NOT in position.	1. Connector on the actuator not completely engaged. 2. Something is physically obstructing the drum from returning to the start position.	1. Check connection to ensure a tight connection. 2. Locate and clear the obstruction.
Dyadic Actuator NOT in requested position.	1. Adjustable Chamber mechanism jammed with debris. 2. One or both of the two connectors linking the actuator to the I/O control panel are not connected. 3. One or both ends of the ethernet cable is not connected to the I/O control panel or the Main control Panel.	1. Open the seed gate, remove debris and power cycle the entire system. When the system is turned back on, the gate will automatically close and find it's HOME position. 2. Ensure that both connectors are securely connected to the I/O control panel. 3. Ensure that both connectors are securely connected to the control panels.
LPV Treater I/O panel: Ethernet Communication Failure.	1. One or both ends of the ethernet cable is not connected to the I/O Control panel or the Main Control Panel. 2. Connections are good but cable is damaged.	1. Ensure that both ends of the cable are connected to the control panels. 2. Replace damaged cable.
Internal Dyadic Actuator error detected on flow control gate. Press alarm "RESET ALARMS" button to initiate the reset of the actuator.	1. Adjustable Chamber mechanism jammed with debris. 2. One or both of the two connectors linking the actuator to the I/O control panel are not connected. 3. One or both ends of the ethernet cable is not connected to the I/O control panel or the Main control Panel.	1. Open the seed gate, remove debris and power cycle the entire system. When the system is turned back on, the gate will automatically close and find it's HOME position. 2. Ensure that both connectors are securely connected to the I/O control panel. 3. Ensure that both connectors are securely connected to the control panels.
Gate Position Actuator at maximum position and desired flow rate has not been achieved. Check for seed flow restrictions.	1. Flow rate may be set to high for the type of seed being treated. 2. Value for the Max Gate position is set to low.	1. Lower the target flow rate. 2. Go to the Product Editing page and make sure the Max Gate Position is set to at least 18000.

TREATER SYSTEM ALARMS-FAULTS

Alarm - Fault	Possible Cause	Solution
Belt VFD Fault.	1. System alarms and stops. The Last Drive Fault popup window appears. 2. After problem is resolved, the VFD will not reset.	1. Read the message in the Drive Weigh Belt display. Take action to correct the issue and press the Reset Fault button. If it turns green, exit out of the window and continue the run. 2. Power down the system. If the VFD does not reset when power is restored, contact your local USC service provider.
Weigh Belt inlet gate not in position (Gate needs to be closed to begin a run).	1. Bad electrical connection. 2. Inadequate or non-existent air pressure to the slide gate cylinder. 3. Slide gate is jammed.	1. Check the electrical connections at the air cylinder and the bottom of the control panel. 2. Check to see if compressor is running. Check the pneumatic connections at the air cylinder and the bottom of the air pressure regulator. 3. Open gate and clean out debris that is binding or blocking the slide gate.
Flow rate out of range.	1. Flow rate is set to low or to high for a particular product density or the hardware configuration at your installation. 2. Inlet is starved for seed. 3. Cardinal 201 weigh scale is out of calibration.	1. Raise or lower the flow rate to resolve the problem. If this does not resolve the issue, a system setpoint may need to be modified. **DO NOT** modify ay setpoints without first consulting a qualified service technician. 2. The maximum amount of seed that the gate is capable of must be flowing at all times. 3. Re-calibrate the scale head.

BIN-SITE TROUBLESHOOTING

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 Bin-Site Calibration).
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.

BIN-SITE TROUBLESHOOTING

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. 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.
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.

BIN-SITE TROUBLESHOOTING

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.
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.

BIN-SITE SYSTEM ALARMS - FAULTS

Below is a table describing the most frequent system alarms, faults and solutions with the USC Automated Bin-Site.

For further assistance, contact USC.

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 recalibrate and rerun system.
Bin Site SURGE SUPPRESSOR-FAILED!!!	1. L1 of the Surge protector will no longer protect the electrical panel against voltage surges.	1. Replace the Surge Protector.
ConvBelt/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.
Conveyor 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.
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.

BIN-SITE SYSTEM ALARMS - FAULTS

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.
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.
Tri-Flo surge suppressor – FAILED!!!	1. L1 of the Surge protector will no longer protect the electrical panel against voltage surges.	1. Replace the Surge Protector.

PROXIMITY SWITCH ADJUSTMENT GUIDE

If a 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 LED lights indicates the power status. If they are active the device is powered.

The center LED is when the switch closes.

Using the small screwdriver, you can adjust the proximity switch by turning the sensitivity dial of the proximity switch.

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

USC LIMITED WARRANTY

SECTION G

USC, LLC, MANUFACTURER WARRANTY ON SEED TREATING EQUIPMENT

01AUG22

USC, LLC, (Manufacturer) warrants its 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 by Manufacturer for all seed treating equipment and a period of 12 months from date of shipment by Manufacturer for all grain and fertilizer handling equipment.

If the Products do not conform to this Limited Warranty during the warranty period, Buyer shall notify Manufacturer in writing (on the approved USC warranty claim form) of the claimed defects and demonstrate to Manufacturer satisfaction that said defects are covered by this Limited Warranty (through pictures, video or other objective data). 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.

All replacement parts orders through Manufacturer will carry their specific manufacturer's standard warranty. There is no warranty on replacement parts manufactured by Manufacturer. Manufacturer will not extend any warranty due to replaced parts. The end user is responsible for all shipping and handling expenses for parts returned to Manufacturer under this section which may or may not be included in that specific warranty. Manufacturer will pay shipping expense between USC and its vendor.

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 affected or attempted by persons other than pursuant to written authorization by Manufacturer. This includes any welding on equipment which could damage electrical components. Manufacturer does not warrant against injuries or damages resulting from misuse and / or abuse of Products, improper storage or handling, acts of nature, effects of weather, including effects of weather due to outside storage, accidents, or damages incurred during transportation by common carrier or Dealer/customer arranged freight. Any replacement or repair covered under this warranty will not extend the warranty period. The remainder of the manufacturer's warranty will remain in force until stated expiration.

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 lost profits, lost revenue, lost sales (whether direct or indirect damages), incidental, special, punitive, indirect or consequential damages. Buyer shall make no claims for renumeration for any loss as a result of USC equipment and USC shall reject any and all claims that may arise as stated herein.

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. The USC Warranty Manager is the final decision point for all warranty claims.

5.Return Policy: Approval is required prior to returning goods to Manufacturer irrespective of warranty claim. Manufacturer may give a credit, less a 15% restocking fee, for goods that are returned in new, sellable condition. Items returned for warranty that are found to be not covered by the warranty will remain the property of the Buyer. The Buyer will have the ability to have part returned at their expense or, if in new, sellable condition, receive a credit less a 15% restocking fee and less any USC paid freight for its return.

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. Other terms included in Manufacturer's Terms of Sale will also apply.

DOCUMENT REVIEW RECORD	
DATE	BY
11-2021	DMW
12-2024	JHT

USC, LLC

2320 124th Road

Sabetha, KS 66534

PHONE: (785) 431-7900

EMAIL: sales-team@uscllc.com

WEB: www.uscllc.com