



FAST System User Manual Walmart, Project #22351

October 1, 2019, Draft Rev. 4



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Revision Log

Date	Revised By	Rev Level	Sections Revised
7/28/17	Linda Halverson	1	Original document draft release
12/7/18	Linda Halverson	2	Operator SW UI updates, removed Admin SW UI
12/21/18	Linda Halverson	3	Document updates per reviews
10/1/19	Linda Halverson	4	Update photos, estop section, safety labels

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1 Document Introduction

This document is to be used as a technical guide and serves as a supplemental reference to the formalized training conducted by CASI (Cornerstone Automation Systems, LLC), or one of its designees. It is intended as a reference for system operations and basic troubleshooting.

1.1 PROPRIETARY INFORMATION

This document and the information contained herein, including attachments, are proprietary to CASI (Cornerstone Automation Systems, LLC). It is not to be disclosed to competitors, third parties, vendors, or others without the prior written consent of an officer of CASI. All intellectual properties, concepts, trademarks and designs relating to this project and provided by CASI (Cornerstone Automation Systems, LLC) remain the property of CASI.

2 Safety

The system is equipped with a safety circuit provided by CASI. The safety circuit is separate from the controls circuit. The safety circuit is intended to remove air and power from all equipment regardless of the status of the Control System.

A series of pull cords, mushroom pushbuttons and/or interlocks are used to control the safety circuit. When the E-Stop is activated, the CASI CORE Controller will display and sound an E-Stop notification.



WARNING: Please review this document as well as all **Original Equipment Manufacturer's** or **(OEM)** manuals supplied with this system and any other relevant manuals carefully to understand safe operating, troubleshooting and servicing procedures.

2.1 GENERAL SYSTEM SAFETY

- First and foremost, **NO** maintenance should ever be performed until the system has been properly powered down and **Lock-Out Tag-Out (LOTO)** procedures implemented. It is the end user's responsibility to establish LOTO procedures that meet their facility's safety requirements.
- Risk of electric shock, pinch point injury, system devices and components energizing and contacting personnel among other injuries could occur if the system is operated or maintenance work is performed in an unsafe manner. Care should be taken at all times when working with moving, rotating, and electrically energized machinery.
- All operation and maintenance should be performed by trained and competent individuals.

2.2 CONVEYANCE SAFETY

- After completion of conveyor installation and **BEFORE** operation, personnel operating the conveyor must be properly trained in its use. It is recommended these employees be walked through the proper sequence of starting and stopping the motor drive, shown where hazardous areas exist along the length of the conveyor (identified by safety labels attached to the conveyor

frame and drive guards) and correct loading and unloading methods. Make sure that safety labels are legible and that personnel understand their meaning.

- Conveyor should **NEVER** be operated with any of the safety guards removed as physical harm could come to the user. All pinch points of the conveyor are guarded and also identified by safety labels attached in the guarded pinch point area. Instruct users to turn the conveyor off and notify the proper personnel should a guard be missing and the conveyor is running. Safety characteristics of the conveyor should **NEVER** be altered if such alterations would endanger personnel.
- Only qualified maintenance personnel should perform work on the conveyor. Should the unit require maintenance, disconnect conveyor motor drive from power source before attempting to adjust or repair conveyor. If guards were removed to perform the maintenance task, they must be replaced before attempting to operate conveyor. If guards are damaged and become unusable they must be replaced.
- Personnel should be alerted to the potential hazard of entanglement in conveyors caused by such items as long hair, loose clothing, and jewelry.

2.3 BAR CODE SCANNERS AND PHOTOEYES SAFETY

Lasers are often used in these systems and devices. As a general safety practice, regardless of the laser's strength, avoid staring at the beam as one would with any very strong light source, such as the sun. Do not point laser beams at other people. Avoid any alignment where the laser beam hits the eye of an observer, even thru reflective surfaces such as mirrors, etc.












2.4 SORTERS, PUSHERS AND DIVERTERS SAFETY

- Just as with conveyors, personnel should be made aware of all potential hazards from entanglement, crush and pinch points.
- All power and air should be shut-off or disconnected before performing any maintenance or repairs.
- These systems should **NEVER** be operated with safety guards and devices removed, disabled or by-passed.

2.5 SAFETY PRECAUTIONS AND WARNINGS

Table 1 – Safety Precautions, Warnings and Safety Labels

<p>Note: Documentation for the components and modules of this system, including third-party components, are included on the USB flash drive. Be sure to read and understand all of the system documentation before operating the system.</p>		
	<p>Be sure to observe all safety and lockout procedures and all other WARNINGS, CAUTIONS, and IMPORTANT NOTICES prior to operating, troubleshooting, or maintaining this system.</p>	
<p>Be sure to observe all safety warning labels and tags:</p>		
 <p>CASI 30562</p>	 <p>CASI 39024</p>	 <p>CASI 30354</p>
 <p>CASI 23292</p>	 <p>CASI 42377</p>	 <p>CASI 42378</p>
 <p>CASI 30359</p>	 <p>CASI 30561</p>	



IMPORTANT NOTICE: It is the customer's responsibility to clone the hard drive and maintain data archives in the CASI CORE HMI.



IMPORTANT NOTICE: Routinely backing up the system is a critical component to system maintenance. The CORE can be replaced, but the data on the hard drive could be lost if it is not backed up on a regular basis. It is the Customer's responsibility to establish and maintain a regular backup schedule.



IMPORTANT NOTICE: Be sure to read and understand the entire [Safety](#) section of this Users Guide. It includes [General System Safety](#), [Conveyance Safety](#), [Bar Code Scanners and Photoeyes Safety](#), [Sorters, Pushers and Diverters Safety](#), [Safety Precautions and Warnings](#), and the [Emergency Stop \(E-Stop\) System](#).



WARNING: Please review this document as well as all **Original Equipment Manufacturer's** or (**OEM**) manuals supplied with this system and any other relevant manuals carefully to understand safe operating, troubleshooting and servicing procedures.



IMPORTANT NOTICE: If any of the system E-Stops are engaged, the entire System will be disabled.



WARNING: Some larger systems have more than one E-Stop zone. If your system has more than one, be sure you know which E-Stop device is associated with each E-Stop zone.



WARNING: Should the end-user (or one its designees) operate this system in a manner for which it is not designed (i.e. other than that outlined in the System Requirements Document provided by CASI) or change the system rate, process, physical dimensions/layout from original installation, such configuration could possibly lead to decreased reliability or possible injury.



WARNING: No maintenance should ever be performed until the system has been properly powered down and Lock Out Tag Out (LOTO) procedures implemented. It is the end user's responsibility to establish LOTO procedures that meet their facility's safety requirements.



IMPORTANT NOTICE: Refer also to the OEM documentation for detailed operating instructions.



CAUTION: Do not turn the Motor Rollers unless the Motor Cable is unplugged. Failure to do so may damage the Motor Drive Card.



WARNINGS

1. Turn electrical supply off and disconnect before servicing or performing any adjustments or machine maintenance.
2. Do not leave the machine running unmonitored.
3. Before starting the conveyors, be sure no tools, unwanted boxes, or other implements are on the conveyor belts.
4. Keep hands and loose clothing away from moving conveyor parts and rollers.
5. Never attempt to work on the machine while the machine is running.
6. Failure to comply with these warnings could result in severe personal injury and/or equipment damage.



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation in your System Documentation Binder and on the USB flash drive.

2.6 EMERGENCY STOP (E-STOP) SYSTEM

The **Emergency Stop (E-Stop) System** uses **Emergency Stop (E-Stop) Buttons** to activate the safety circuit. Pushing an E-Stop button causes system components, including drive rollers, drive cards, photoelectric sensors (photoeyes), and VFDs (Variable Frequency Drives) to halt. The E-Stop buttons also shut down all of the air dump valves and cause all pneumatic air to be exhausted from the system.

In the event an E-stop device is triggered, an announcement is made on the CASI CORE HMI (Human Machine Interface).

For immediate system shut down, push a red E-Stop button to completely turn off the system. **This function should only be used in an actual emergency.** After resolving the issue that triggered the necessity of the E-Stop, follow these steps for mechanical operation to resume.:

1. Turn the E-Stop button clockwise.
2. Press the Reset button on the CORE HMI.
3. Press the Start button on the CORE HMI.

A **Designated Person** should check the emergency stop (E-stop) buttons for proper operation, physical damage, button looseness, and excessive environmental contamination. This should take place on a periodic schedule determined by the user, based on the severity of the operating environment and the frequency of switch actuations. Adjust, repair, or replace components as needed. If inspection reveals contamination on the switch, thoroughly clean the switch and eliminate the cause of the contamination. Replace the switch and/or appropriate components when any parts or assemblies are damaged, broken, deformed, or badly worn; or if the electrical/mechanical specifications (for the environment and operating conditions) have been exceeded. **Always test the control system for proper functioning** under machine

control conditions after performing maintenance, replacing the emergency stop device, or replacing any component of the device.

CASI recommends the end user conduct a risk assessment and risk reduction analysis (see ISO 12100 or ANSI B11.0) to determine the appropriate frequency for E-stop system checks. In lieu of the assessment and analysis, test each component before start of each production day. Refer to the [E-Stop System Check Procedure](#) for the process to check the E-stop system.



Figure 1 – Emergency Stop (E-Stop) Button



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation on the USB flash drive.

2.6.1 EMERGENCY STOP RESET PROCEDURE

2.6.1.1 General

When an emergency stop is pressed all power is removed from the system IO. This is accomplished by de-energizing the safety relay. The safety relay in turn opens its contacts. The opening of these contacts removes power from the PS100 boxes in the field. The PLC places the system into E-Stop Recovery mode. E-Stop recovery mode forces all sorters to an occupied state and controls the startup of the Manifest line in a way that allows it to empty out from head end to tail end.

The operator returns the system to normal operation by first resetting the pushbutton that was activated. The second step is to click on the “Emergency E-Stop Reset” icon on the CASI CORE HMI (Human Machine Interface). Activating this icon energizes the safety relay and begins the recovery process.


2.6.2 E-STOP SYSTEM CHECK PROCEDURE

Follow these steps to check the Emergency Stop (E-Stop) system:

1. Press an E-Stop Button
2. Verify that **all** mechanical functionality stops through the entire system.
3. Reset the E-Stop by turning the red mushroom pushbutton clockwise.
4. Press the **Reset the E-Stop** button on the CORE HMI (Human Machine Interface)
5. Press the green **Start** button on the CORE HMI to restart the system.

For more detailed information on E-Stop components, refer to the reference documents in the following table, located on the USB flash drive.

Table 2 – E-Stop Component Reference Documents

Component	Reference Document	USB
 <p data-bbox="290 726 646 756">Figure 2 - E-Stop Button on Halo</p>	<p data-bbox="760 422 1328 520">Document Name: "IDEC XW Series Emergency Stop Switches Data Sheet"</p> <p data-bbox="760 564 1321 636">Electronic File Name: <i>IDEC XW Series E-Stop Switches Data Sheet.pdf</i></p>	<p data-bbox="1377 447 1403 474">✓</p>



IMPORTANT NOTICE: Refer also to the OEM documentation for detailed functionality of the E-Stop Reset Button.

2.6.3 RESTART ROUTINE AFTER AN E-STOP

1. Resolve the issue that triggered the necessity of the E-Stop.
2. Reset the E-Stop device that was triggered.
3. Press the **Emergency E-Stop Reset** button on the CORE HMI.
4. Press the green **Start** Button on the CASI CORE HM.

2.6.4 DAILY SYSTEM SHUTDOWN

1. Click the system's **STOP** button (preferred) on CASI CORE Main screen to stop all pieces of equipment on the system.
2. Click the **EXIT** icon on the SolidSuite™ interface.
3. Shut down CASI CORE HMI.
4. Power down (turn **OFF**) all associated equipment and/or turn **OFF** disconnects according to current plant procedures and practices.



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation on the USB flash drive.

2.7 SYSTEM SHUT DOWN AND LOCK OUT TAG OUT (LOTO)



WARNING: No maintenance should ever be performed until the system has been properly powered down and Lock Out Tag Out (LOTO) procedures implemented. It is the end user's responsibility to establish LOTO procedures that meet their facility's safety requirements.



WARNINGS

1. Turn electrical supply off and disconnect before servicing or performing any adjustments or machine maintenance.
2. Do not leave the machine running unmonitored.
3. Before starting the conveyors, be sure no tools, unwanted boxes, or other implements are on the conveyor belts.
4. Keep hands and loose clothing away from moving conveyor parts and rollers.
5. Never attempt to work on the machine while the machine is running.
6. Failure to comply with these warnings could result in severe personal injury and/or equipment damage.

2.7.1 REPLACEMENT PARTS AND SERVICE INFORMATION

For more information on replacement parts, refer to the *Spares List* included in your CASI System Documentation binder and on the USB flash drive.

2.8 MECHANICAL OPERATION

IMPORTANT – Please read all [safety warnings](#) before operating the conveyors or lasers.

This CASI receiving dock scan and sort system is powered by CASI's proprietary SolidSuite™ Management Software loaded on an industrial computer.

2.9 ELECTRICAL AND MECHANICAL DIAGRAMS

All electrical and mechanical diagrams are included in your CASI binder and on the USB flash drive.

2.10 DESIGN SPECIFICATIONS

For more information on design specifications, refer to the documentation in System Documents, Section 1, located in your CASI binder and on the USB flash drive.

2.11 ENVIRONMENTAL SPECIFICATIONS

Relative Humidity	20 to 90% Non-Condensing
Operating Temperature	0°to 40°C (32° to 104°F)
Operating Altitude	Up to 2,000 meters (9,843 ft) above sea level, no derating for 35°C (95°F) room temperature
Storage & Transit Temperature	Storage and transportation temperatures within the range of -25°C to 55°C (-13°F to 131°F) and up to 70°C (158°F) for short periods not exceeding 24 hours.

NOTE: The floor must be solid and vibration free to ensure the system performance is not affected.

2.12 POWER

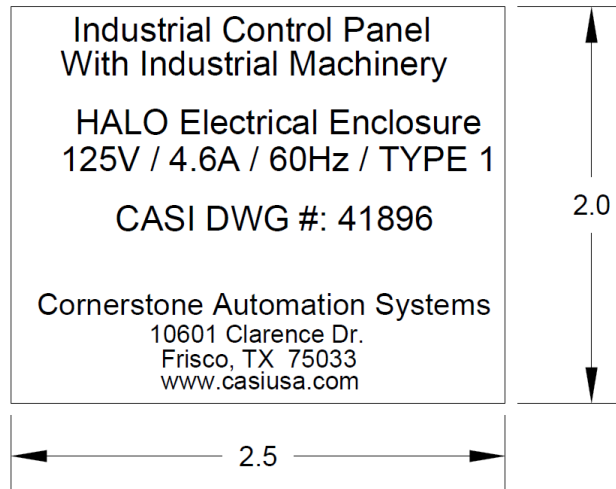
The production site will require the following externally provided power:

- 120 VAC 30 amps 60 Hz

2.13 SYSTEM LABELING

The following labels are found on the electrical boxes of the modules.

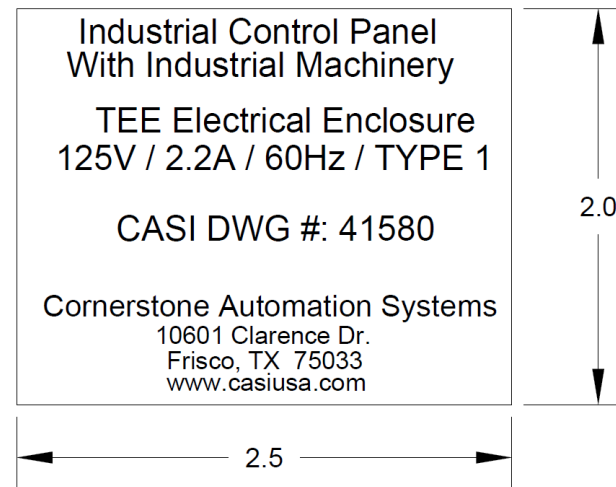
2.13.1 SCANNING HALO MODULE ELECTRICAL BOX LABELING



BLACK LETTERING ON WHITE BACKGROUND

Figure 3 – Scanning Halo Module Electrical Box Labeling

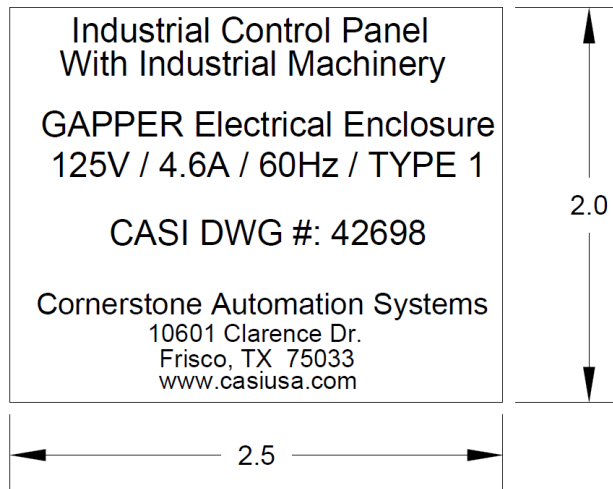
2.13.2 TEE MODULE ELECTRICAL BOX LABELING



BLACK LETTERING ON WHITE BACKGROUND

Figure 4 – Tee Module Electrical Box Labeling

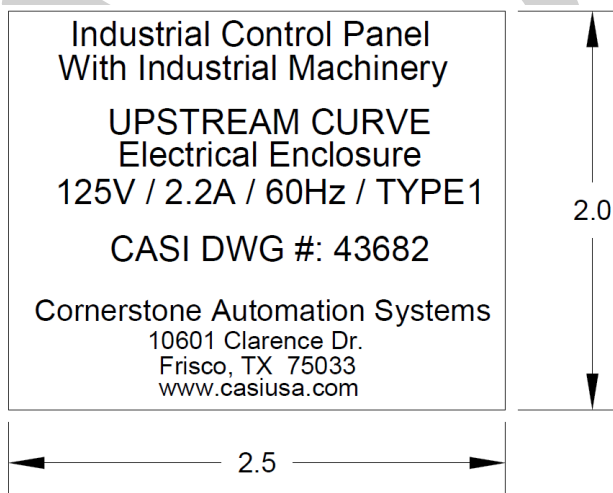
2.13.3 GAPPER MODULE ELECTRICAL BOX LABELING



BLACK LETTERING ON WHITE BACKGROUND

Figure 5 – Gapper Module Electrical Box Labeling

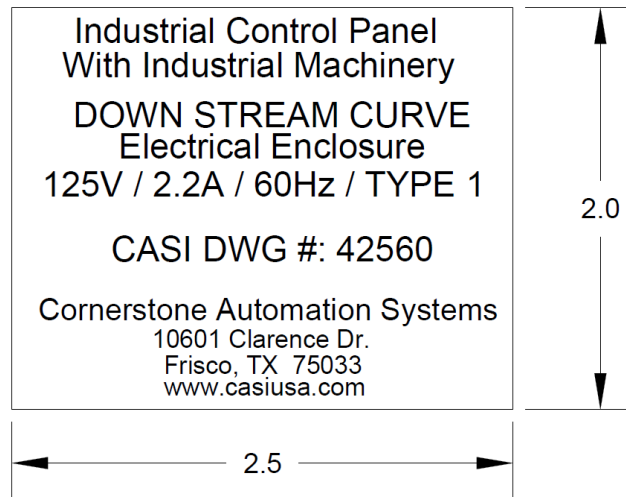
2.13.4 UPSTREAM CURVE ELECTRICAL BOX LABELING



BLACK LETTERING ON WHITE BACKGROUND

Figure 6 – Upstream Curve Electrical Box Labeling

2.13.5 DOWNSTREAM CURVE ELECTRICAL BOX LABELING



BLACK LETTERING ON WHITE BACKGROUND

Figure 7 - Downstream Curve Electrical Box Labeling

2.13.6 DISCONNECTING LABEL



BLACK LETTERING ON ORANGE BACKGROUND

Figure 8 – Disconnecting Label

3 Operational Requirements

The following requirements **must be implemented** before and during equipment operations:

- Ensure all units are within specification.
- Ensure all inbound units are in the proper orientation for processing.
- Only use **Emergency Stop (E-Stop)** devices in cases of emergency.

- Use a soft stop to **STOP/HALT** the system in non-emergency scenarios.
- Always attend to operator alerts and system errors on all equipment and sub-systems.
- Ensure there are no jams or product on the CASI line at system start up.
- Perform all preventive maintenance as required and specified by CASI.
- Purchase spare parts before the delivery of the system to the site to allow for spares availability during installation and start up.

CASI

4 System Overview

This CASI system provides Walmart with a receiving dock scan and sort system to unload boxes from trucks (trailers), and sort them onto carts. This results in more accurate sorting, prioritizing out of stock items and quicker stocking of shelves. Cartons are sorted by department, category, or store aisle.



NOTE: To see the mechanical layout of the components in this system, please refer to the drawing **21983 – Walmart Mechanical Layout.pdf** located in your CASI System Documentation Binder and on the USB flash drive.



Figure 9 - The CASI Receiving Dock Scan & Sort System for Walmart

4.1 HARDWARE

The system as a whole is comprised of hardware and software, including the following:

- CASI CORE HMI (Human Machine Interface) – an all-in-one computer and touch-screen monitor
 - Flexible Automated Sorting Technology (FAST) Software
 - WebVisu Software
- Flexible Conveyors (3)
- CASI Gapping Module
- CASI Scanning Module
 - DataLogic DX8210 Barcode Scanner
 - DataLogic CBX510 Connection Box
 - Visio 40-inch TV Monitor
 - Emergency Stop (E-Stop) Buttons
- CASI Sorter Modules

- CASI SM-101E SortMaster™ Bi-Directional Sorters
- CASI Gravity Wing-Type Conveyors
- CASI 24Vdc Conveyors (all Modules)
 - Banner QS12 Series Photoelectric Sensors (photoeyes)
 - Telemecanique Bar Sensors (photoeyes)
 - Conveylinx ERSC Drive Cards
 - Conveylinx Senergy Drive Rollers
 - PULS QS20.241 Power Supply
 - IDEC XW Series Emergency Stop (E-Stop) Buttons
- Reject Lane Wedge
- Reject Conveyor (Provided by Walmart)
- Topstock Carts (Provided by Walmart)



NOTE: For more specific information regarding CASI and third-party components, refer to the **Walmart 21983 FAST System Documentation USB Contents List**, located at the very front of your System Documentation Binder, and listed first on the USB flash drive.

5 System Mechanical Functionality

This section explains the mechanical functionality of the components of this system.

5.1 CASI CORE HMI (HUMAN MACHINE INTERFACE)

The CASI CORE HMI (Human Machine Interface) consists of an all-in-one computer and touch-screen monitor. It is mounted on the side of the Scanning Module, as shown in the following figure. The barcode scanner with communication box and CASI SM-101E SortMaster™ Bi-Directional Sorters communicate with the CASI Core HMI.

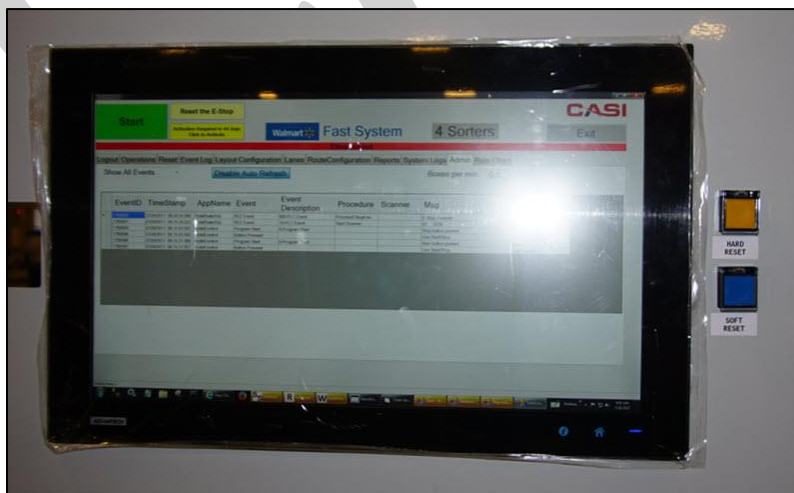


Figure 10 – CASI CORE HMI (Human Machine Interface)



IMPORTANT NOTICE: It is the customer's responsibility to clone the hard drive and maintain data archives in the CASI CORE HMI.

5.2 FLEX CONVEYORS

The flex conveyors stretch from inside a truck to the front of the CASI system. The initial setup of the system includes one (1) flex conveyor. Additional flex conveyors are added to the system as the truck gets emptied.



Figure 11 – Flex Conveyor



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation on the USB flash drive.

5.2.1 CARTON PLACEMENT ON FLEX CONVEYOR

The Thrower places each item on the flex conveyor with the RDC label facing up. It is important to keep a consistent speed and quality of placement in order to have a successful unload. Going too fast will jam the machine and cause slowdowns. Going too slow will cause the unload to be ineffective.

Note: Items should have a flat bottom.

Note: Oversized items **must not** be placed on the conveyor. Examples are swimming pools, grills, lawn mowers, furniture, etc.

Note: Items that are odd shaped or do not travel down the conveyor safely must not be placed on the conveyor. Examples are fishing poles, 5-gallon paint buckets, bagged dog food, bagged rice, weights, etc.

5.3 GAPPING CONVEYOR

The flex conveyor attaches to the CASI Gapping Conveyor, which puts space between boxes before they enter the CASI Scanning Module.



Figure 12 – Gapping Conveyor

5.4 SCANNING MODULE

A barcode scanner reads the RDC shipping label on the item to determine which lane to sort the item to.



Figure 13 – Scanning Module

5.4.1 DATALOGIC BARCODE SCANNER

The DataLogic DX8210 Barcode Scanner scans the barcode label on the top of the item and the CBX510 Communication Box relays the information to the CASI PLC.

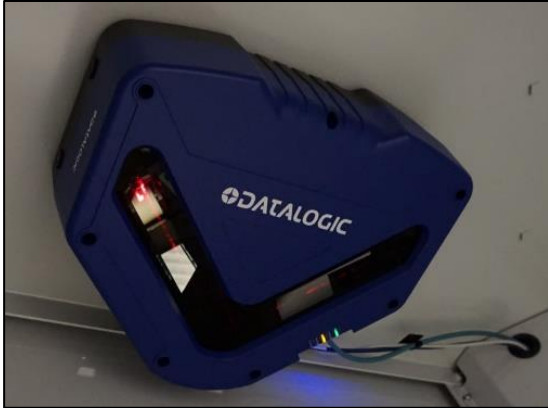


Figure 14 – Datalogic DX8210 Barcode Scanner



Figure 15 – DataLogic CBX510 Communication Box



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation in your System Documentation Binder and on the USB flash drive.

5.4.2 40 INCH TV/MONITOR

The WebVisu screen is displayed on a large monitor. In the event of a lane full or jam, an error message will display on the screen.



Figure 16 – Visio 40" TV/Monitor

5.4.3 SYSTEM INDICATOR LIGHTS

There are a set of indicator lights on both the front and back of the Scanning Module. These red, yellow and green lights indicate the status of the system.

The colors have the following meanings:

1. Red – System has been-stopped by an E-stop (Emergency Stop) button
2. Yellow
 - a. Flashing – Lane full or system starting
 - b. Steady – Sorter or ZPA jam
3. Green – System is running without error



Figure 17 – System Indicator Lights - Front



Figure 18 – System Indicator Lights - Rear

5.5 SORTER MODULES

The Sorter Modules sort cartons on both sides of the main line. Cartons are sorted by department, category, or store aisle.



Figure 19 – Sorter Module

5.6 CASI SM-101E SORTMASTER™ BI-DIRECTIONAL SORTERS

CASI SM-101E SortMaster™ Bi-Directional Sorters are used in this system. These sorters route boxes from the main conveyor line onto the sorter conveyors.



Figure 20 – CASI SM-101E SortMaster™ Bi-Directional Sorter



NOTE: For further information on the operation and maintenance of this CASI sorter, refer to the “*CASI SM-101E User Guide.pdf*”, located in your System Documentation Binder and on the USB flash drive.

5.7 REJECT LANE / MANUAL CONVEYOR

The Reject Lane / Manual Conveyor is provided by Walmart and placed at the end of the system, behind the last Sorter Module.

5.8 PRODUCT RECOGNITION PHOTOELECTRIC SENSORS

Throughout the system, conveyors have product recognition photoeyes mounted beneath the conveyor rollers, as shown in the following figure. As a box passes over of them, the photoeyes trigger the drive rollers to start or stop that section of the conveyor.

Other product recognition photoeyes indicate when a sorter lane is full, which stops the system until boxes are removed from that lane. Once the photoeye is clear, normal system operation resumes.



Figure 21 - Product Recognition Photoeyes



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation in your System Documentation Binder and on the USB flash drive.

5.9 DRIVE ROLLERS AND DRIVE CARDS

The conveyors consist of idler rollers, drive rollers, and drive cards. There is one drive roller and drive card per section of conveyor. The drive roller is the first roller of each conveyor section. This drive roller pulls the idler rollers in that section of the conveyor.



Figure 22- Conveylinx Drive Roller



Figure 23 – Conveylinx Drive Card



NOTE: For more detailed information on OEM (Original Equipment Manufacturer) components, refer to the OEM documentation in your System Documentation Binder and on the USB flash drive.

6 Assembling the System

The following directions are used to assemble the system.

Important Note: Perform all steps in order.

1. Retrieve all modules from stored area.

Note: Floor Plan is store specific. The quantity of Sorter Modules will vary by store. Yellow arrows and 'Front' indicate the direction **towards** the truck.



Flex Conveyors



Gapping Conveyor



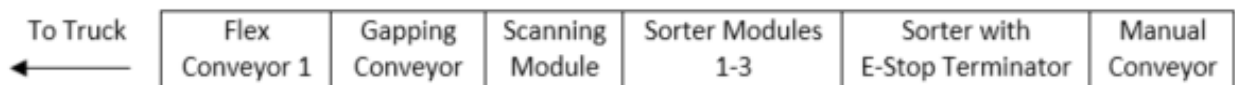
Scanning Module



Sorter Module

Manual Conveyor
(Provided by Walmart)

2. Lay out the modules by following this diagram. The **front** of all modules face towards the truck.

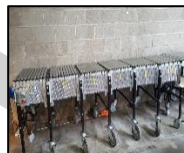


Note: The sorter module at the end **must** be the one with the E-Stop Terminator cable.

Note: Place extra flex conveyors nearby to be used as the truck gets emptied.

Note: Flex Conveyor 1 has a black frame marked with an arrow and "TRUCK" and should be used first.

Note: As the trailer is emptied, connect extra flex conveyors between Flex Conveyor 1 and the Gapping Module as needed.



3. Align modules and lock together, using the silver or yellow hooks.



Flex Conveyor to
Gapping Conveyor



Align Bottom



Pull Together



Hook In Place

4. Lock all module wheels.



Locked



Unlocked

5. Connect cables between all modules and flex conveyors.



Flex Conveyor Connector



Module Connector

6. Plug overhead power cord (dropped from ceiling) into Scanning Module.

Important Note: Do **NOT** plug into the power cord until all cables have been hooked together!

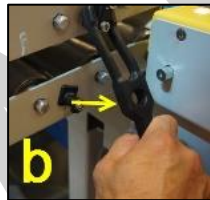
7. Press all **Start** buttons on the flex conveyors (there is one on both sides of each flex conveyor). The flex conveyors will not start until all Start buttons are pressed.



Note: Pressing a **Stop** button on a flex conveyor will only stop all 3 flex conveyors – it will **not** stop the system.

8. Unfold wings from sorter modules.

- Lift the wing from side of sorter module.
- Unhook black easy-disconnect hook strap.
- Rotate wing around pivot pin until fully opened.



9. Position Topstock Carts (provided by Walmart) between the Sorter Modules. Position extra Topstock Carts as directed by your supervisor.



10. Proceed to the **System Operation for Operators** procedures.

Table 3 - System Operation for Operators

Important Note: Perform all steps in order.

1. Push the blue **Soft Reset** button next to the small monitor mounted on the side of the Scanning Module.
2. Using the remote control, turn on the large TV monitor mounted on the back of the Scanning Module.

3. Double click the blue FAST software icon.
4. Using the on-screen keyboard, enter **User Name** and **Password**.
5. Close keyboard.
6. Click **Log In** button.

Flexible
Automated
Sorting
Technology



Login Users
Please Enter User Name and Password

User Name

Password

Log In



Important Safety Guidelines!

- Observe all safety warning labels.
- Do not stand, sit, or lean on any part of the system.
- Be aware of all potential hazards from entanglement, crush and pinch points.
- Keep hands, long hair, loose clothing and jewelry away from moving conveyor parts and rollers.
- This system should NEVER be operated with safety guards and devices removed, disabled, or bypassed.
- Do not leave the system running unmonitored.
- Before starting the system, be sure there are no boxes or other items on the conveyors.
- This system should not be operated in a manner for which it is not designed.
- Failure to comply with these safety guidelines could result in personal injury and/or equipment damage.

In an emergency, pushing an **E-Stop** button causes the entire system of modules to halt. It does NOT stop the flex conveyor.

Resetting the E-Stop:

- A. Reset/Clear **all** E-Stop buttons that have been pressed.
- B. Press the **Start** button on the monitor screen.



Daily E-Stop Verification:

- A. Press an E-Stop button. It will light up and stay lit until reset.
- B. Verify that **all** mechanical functionality stops through the entire system.
- C. Reset the E-Stop by turning the red pushbutton clockwise and pulling it out.
- D. Restart the system by clicking the **Start** button.
- E. Wait for system to check and initialize the sorters.
- F. Do this for all **E-Stop** buttons before beginning normal operation.

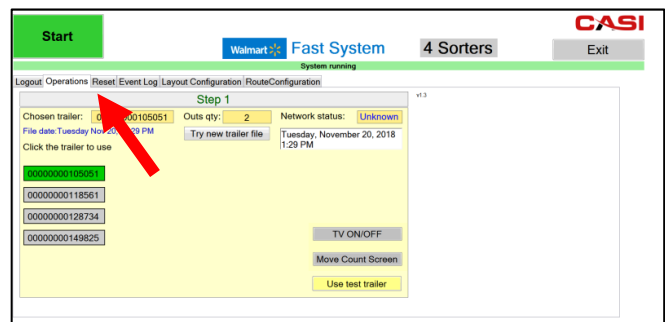
Note: The sorter module nearest the reject lane **must** be the one with the E-Stop Terminator cable.

Unloading a Trailer:

1. On the monitor screen, select the **Operations** tab.
2. Select the trailer to be unloaded.

Event Log tab: At any time, you can view real time system events by selecting this tab.

System Log tab: At any time, you can view system errors by selecting this tab.



3. Click the **Start** button. Dome light blinks blue several times then turns green – system is ready and sorter modules are initialized.



Note: The **Start** button toggles to a **Stop** button that can be used to stop the system at any time.

4. Turn flex conveyors on.

5. Unload trailer.

- a. Place boxes on flex conveyor, narrow edge leading.
- b. Boxes must have a hard, flat bottom.
- c. Barcode label must be on the top of the box.
- d. Minimum box size is length 6" x width 6" x height 1".
- e. Maximum box size is length 48" x width 25" by height 30".
- f. Maximum box weight is 55 lbs.

6. Unload sort lanes (gravity conveyors).

- a. Do not allow more than a total of 150 lbs to accumulate on a sort conveyor.
- b. If a sort lane (gravity conveyor) is full and a box needs to go there, the box will stop on main conveyor. Empty sort conveyor to allow normal operation to continue.

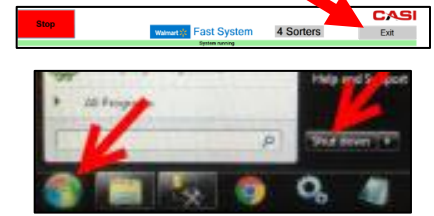
7. Next, do one of the following:

- a. If problems are encountered, go to the **System Troubleshooting** procedures
- b. If another trailer is to be unloaded, go to **Unloading a Trailer**, above in this procedure.
- c. If no other trailers are to be unloaded, go to the **System Tear Down & Put Away** procedures.

Table 4 – System Tear Down & Put Away

Important Note: Perform all steps in order.

1. Shut down the scanning module software.
 - a. Click the **Exit** button near the top right corner of screen.
 - b. Click the **Windows** icon in the lower left corner of screen.
 - c. From the list, select **Shut Down**. Some programs may still be open and upon shutdown you will get a message asking if you want to force shutdown. If so, select the **Force Shutdown** button. It will ask if you are sure, select **Yes**.



2. Using remote control, turn off large TV monitor
3. Unplug overhead power cord (dropped from ceiling) from Scanning Module.

Important Note: Do NOT proceed until scanning module has been unplugged from overhead power cord!

4. Fold in and lock wings on sorter modules
 - a. Rotate wing around pivot pin until the conveyor is folded in half.
 - b. Re-hook the black easy-disconnect hook strap.
 - c. Release the locking pin by pulling up and fold flat against module.



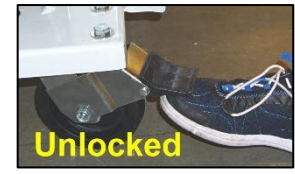
5. Disconnect all cables between modules and flex conveyors.



Flex Conveyor Connector

Module Connector

6. Unlock wheels on sorter modules.



7. Unhook all sorter modules and pull apart.

Important Note! Make sure no cables are still attached before moving modules!



Yellow Hook Bar

Pull Up

Pull Away

8. Unhook gapping conveyor and flex conveyors and pull apart.

Important Note: Make sure no cables are still attached before moving modules and flex conveyors!

9. Move modules to assigned storage area.

Important Note: Never move the system while it is put together! All modules **must** be moved individually!

Table 5 – System Troubleshooting

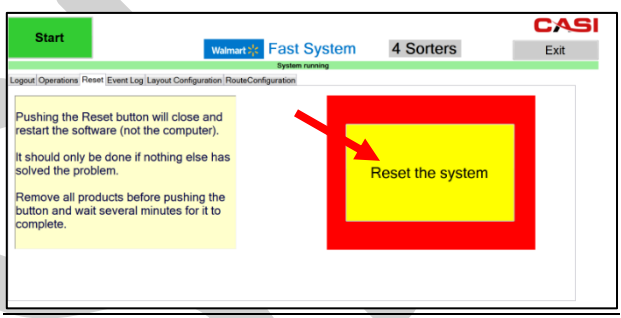
<ol style="list-style-type: none"> 1. If a box has stopped on a sorter module or sorter infeed (rollers) and the dome light is yellow: <ol style="list-style-type: none"> a. Look on the screen and identify the location of the stopped box. b. Remove the box and place in the appropriate location. c. The system will start automatically. (You don't have to push start). 2. If a box has stopped on a sorter module and the dome light is red: <ol style="list-style-type: none"> a. Check to see if E-stop button(s) are pressed. b. If so, reset E-stop button. c. Press Start. 3. If a box has stopped on a sorter module and the dome light is green: <ol style="list-style-type: none"> a. Wait and observe, a lane is most likely full and the boxes will move once a lane is cleared. 	
<p>Resetting the Software</p> <ol style="list-style-type: none"> 1. Select the Reset tab. 2. Click the Reset the System button. On the popup message, Are you sure?, click Yes. <ol style="list-style-type: none"> a. Pushing the Reset button will close and restart the system and should only be done after all other troubleshooting efforts have failed to solve the problem. b. Remove all boxes before restarting system and wait several minutes for restart procedure to complete. 	
<p>Removing a Non-Functioning Sorter Module</p> <p>If a sorter module does not return to operation, follow these steps to remove it from the configuration:</p> <ol style="list-style-type: none"> 1. Press the E-Stop button. 2. Remove the Sorter Module (Refer to System Tear Down & Put Away procedures). 3. Reset the E-Stop button. This triggers the system to rescan and may take 60 seconds or more. 4. The system is ready to resume operation. Press Start button. 5. Go back through the Daily E-Stop Verification System: <ol style="list-style-type: none"> A. Press an E-Stop button. It will light up and stay lit until reset. B. Verify that all mechanical functionality stops through the entire system. C. Reset the E-Stop by turning the red pushbutton clockwise and pulling it out. D. Restart the system by clicking the Start button. E. Wait for system to check and initialize the sorters. F. Do this for all E-Stop buttons before beginning normal operation. <p>Note: If the non-functioning sorter module is the one closest to the reject lane, the E-Stop Terminator cable must be removed from that sorter module and then placed on the sorter module that will then be closest to the reject lane.</p>	

Table 6 – Monthly Cleaning Guide

Wipe down modules, including photoelectric sensor bars (photoeyes), rollers and all metal surfaces using approved cleaning cloth and cleaning solution, such as window cleaner. **Do not hose down modules!**

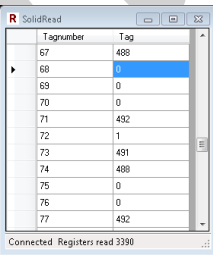
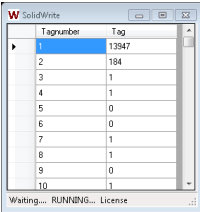
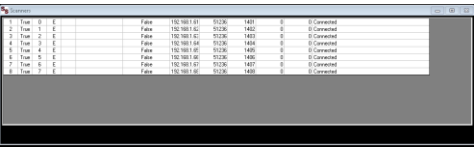
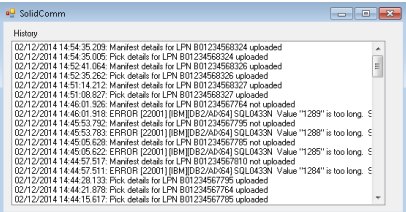
7 CASI SolidSuite™ Management Software Overview

The CASI SolidSuite™ Management Software is part of an advanced system that ships with each of our products. This system supports the CASI CORE HMI (Human Machine Interface) and controls component operation. The FAST (Flexible Automated Sorting Technology) software user interface is part of this proprietary SolidSuite™ software.

The CASI-SolidControl™ Management Software interfaces with a SQL database stored locally on the CASI Core Controller. The SQL database stores critical information gathered from each of the peripheral devices on the CASI system.

The SolidSuite™ Management Software for this system is run on the CASI CORE by SolidControl™. The module functions used within this system are listed in the following table.

Table 7 – SolidSuite™ Software Modules

Module	Function	Image
SolidControl™	This is the principle module that runs your system.	
SolidRead™	This is the standard PLC module to read data. The CASI SolidRead™ software module reads from the systems PLC and interfaces to the SolidControl™ software. This interface is view-only.	
SolidWrite™	This is the standard PLC module for writing data. The CASI SolidWrite™ software module writes to the system's PLC and interfaces to the SolidControl™ software. This interface is view-only.	
SolidScan™	SolidScan™ is the standard module for all scanning on the system. It interfaces with the system scanners to the CASI CORE modules. This interface is view-only.	
SolidComm™	SolidComm™ is the communications module that enables CASI to exchange data with host systems. This interface is view-only.	

8 System Operation for Operators

CASI is providing to Walmart a Receiving Dock Scan & Sort System to unload and sort boxes from trucks (trailers) in their stores. CASI's FAST (Flexible Automated Sorting Technology) software allows users to easily operate, configure, and monitor the system. The FAST software user interface is part of CASI's proprietary SolidSuite™ software.

Control of the system is done by accessing the software user interface on the CASI CORE HMI (Human Machine Interface) on the side of the Scanning Halo Module. The CASI CORE HMI is an all-in-one computer and touch-screen monitor.

The following are the startup and shutdown procedures as well as operating instructions for the system for Operators.

8.1.1 SYSTEM ADMINISTRATORS

For complete system operation instructions, please refer to the CASI System Administrator's Software User Interface Instructions document included in your system documentation package

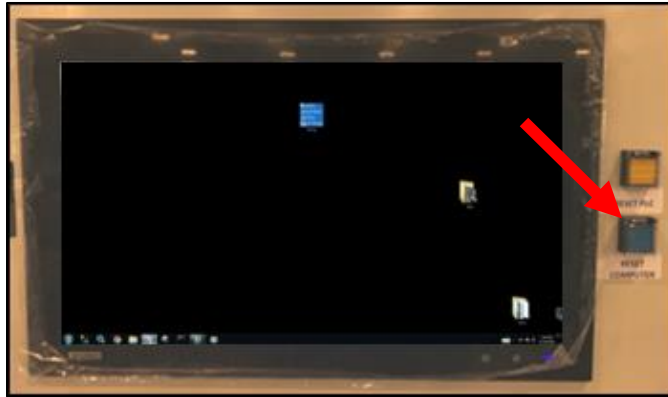
8.2 ACCESSING THE CASI CORE HMI (HUMAN MACHINE INTERFACE)

To access the CASI CORE HMI, follow these steps:

1. Unlock and open the door on the side of the Scanning Module. The key is hanging on a magnetic hook to the left of the door.



2. Once the door has been unlocked, swing it all the way open so that it is aligned with the side of the module and out of the way.
3. Press the **Reset Computer** button to the right of the monitor screen. A typical desktop displays.



8.3 LOGGING INTO THE SOFTWARE

The CASI CORE HMI (Human Machine Interface) computer screen has an icon for starting the Flexible Automated Sorting Technology (FAST) software.

To open the software program, double-click this icon. This will begin all of the modules initiating operation of the CASI system. The FAST software's user interface will appear on the CORE HMI monitor screen.

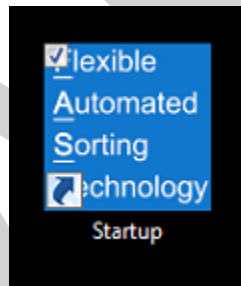


Figure 24 – FAST Software Shortcut Icon on CASI CORE HMI (Human Machine Interface)

8.4 INITIALIZING THE SORTERS

When the software opens, it begins identifying the sorters on the system. The following message displays. This may take a few minutes to complete.

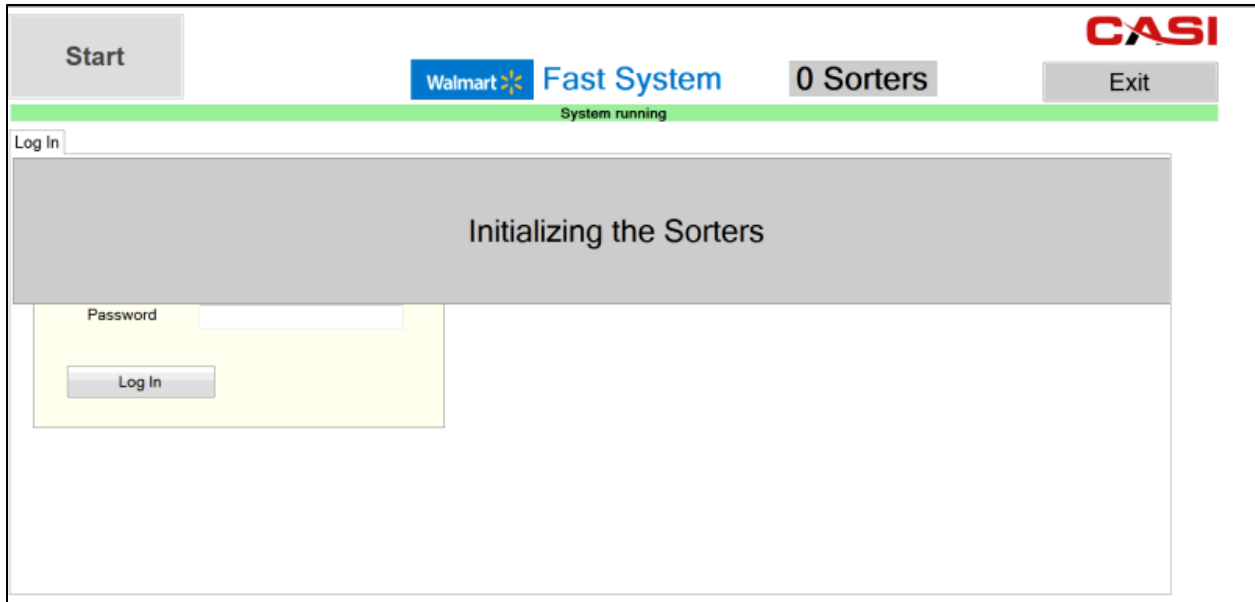


Figure 25 – Initializing the Sorters Message

8.5 LOG IN SCREEN

The Log In screen enables you to log into the system. The interface you see after logging in will depend on the user access level assigned to you.

There are (2) two user access levels:

1. Operator
2. System Administrator

8.5.1 LOGGING IN TO THE SYSTEM

To log in to the CASI CORE HMI, follow these steps:

1. Open the onscreen keyboard by clicking the icon near the lower right corner of screen.



Figure 26 – Onscreen Keyboard Icon

The onscreen keyboard displays.



Figure 27 – Onscreen Keyboard Lowercase Letter

2. Enter **User Name** and **Password**. In this example, “w” was entered for both User Name and Password.
3. Click **Log In** button.

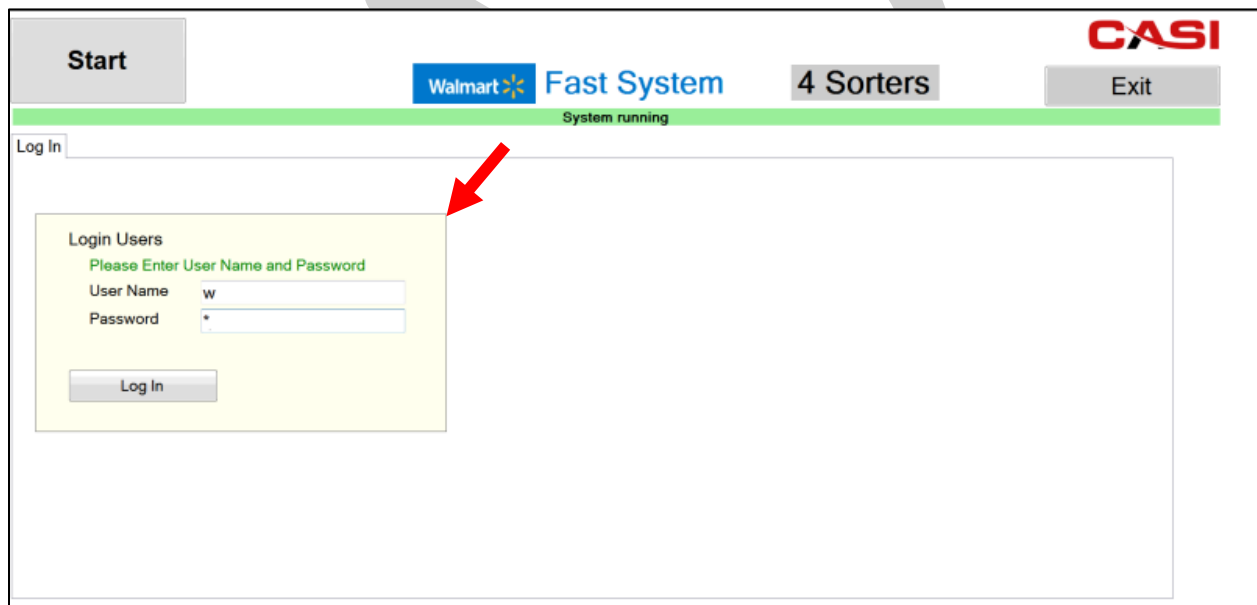


Figure 28 – Log In Screen

The screen displays a message that the user is logged on.

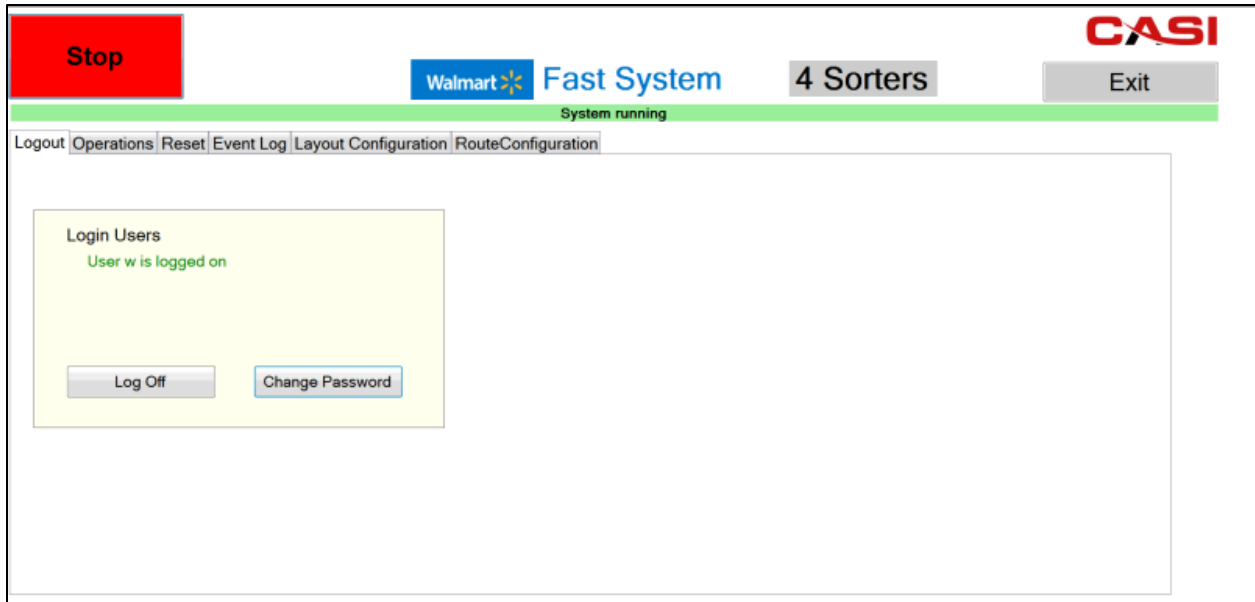


Figure 29 – User is Logged On Message

4. Close the onscreen keyboard by clicking the 'x' in the upper right corner.



Figure 30 – Closing the Onscreen Keyboard

8.6 LOGOUT TAB

Use the **Logout** tab to log off or change your password.

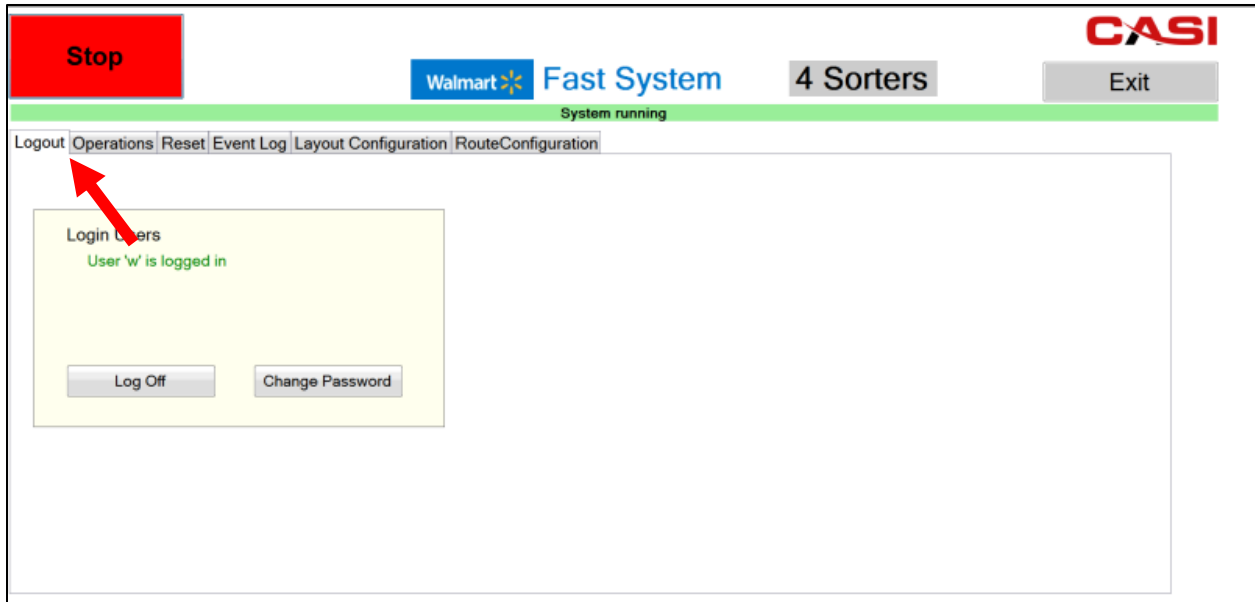


Figure 31 – Logout Tab

8.6.1 LOG OFF BUTTON

To log out of the FAST software, click the **Log Off** button located under the **Logout** tab.

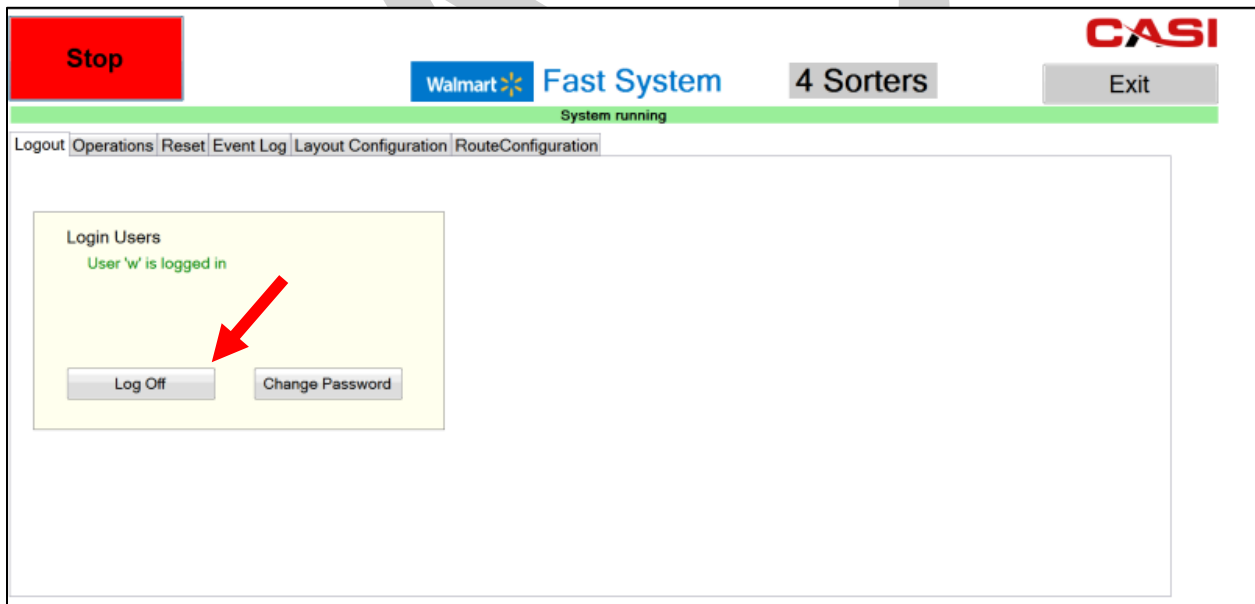


Figure 32 – Log Off Button

8.6.2 CHANGE PASSWORD BUTTON

To change your password, click the **Change Password** button.

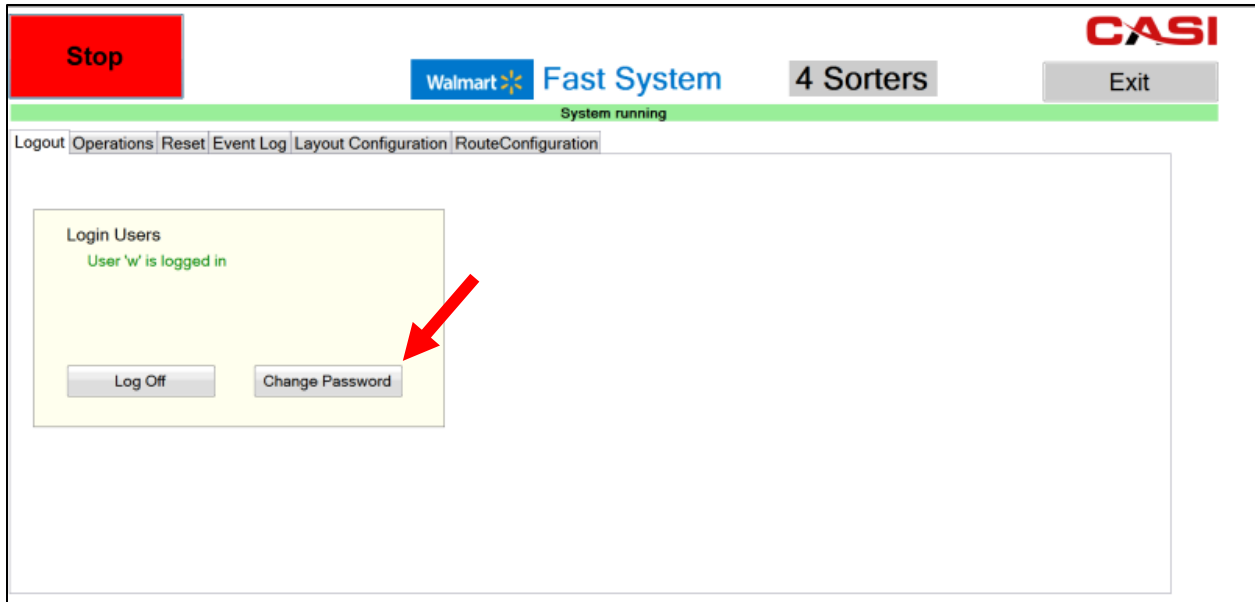


Figure 33 – Change Password Button

The **Change Password** screen displays.

8.6.3 PASSWORD CREATION RULES

1. Must have at least one lowercase letter
2. Must have at least one uppercase letter
3. Must have at least one numeral
4. Must not have anything else but letters and numerals
5. Must be between 7 and 16 characters long

8.6.4 CHANGE PASSWORD STEPS

Follow these steps to change your password:

1. Enter **User Name**.
2. Enter **Old Password**.
3. Enter **New Password**.
4. Click **Submit** button.

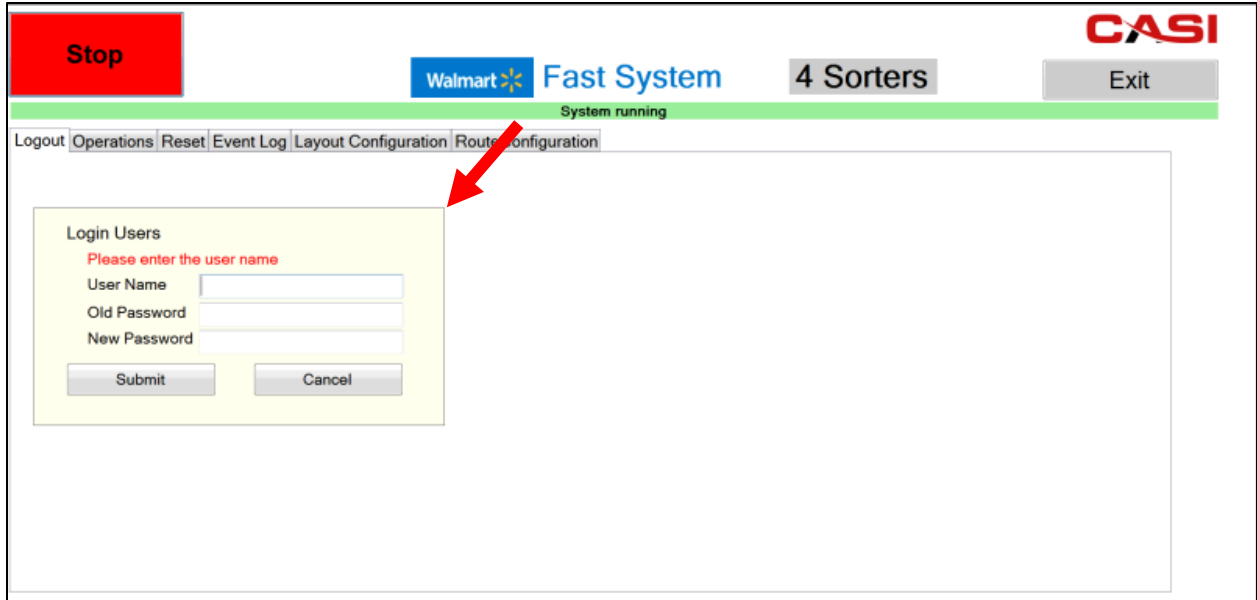


Figure 34 – Change Password Screen

8.7 START/STOP TOGGLE BUTTON

The **Start** button toggles to a **Stop** button. This Stop button can be used at any time to stop the system and is sometimes referred to as a “soft stop”. To restart the system after a soft stop, select the **Start** button on the touch screen (as long as no physical Emergency Stops (E-Stops) were engaged during the system halt).

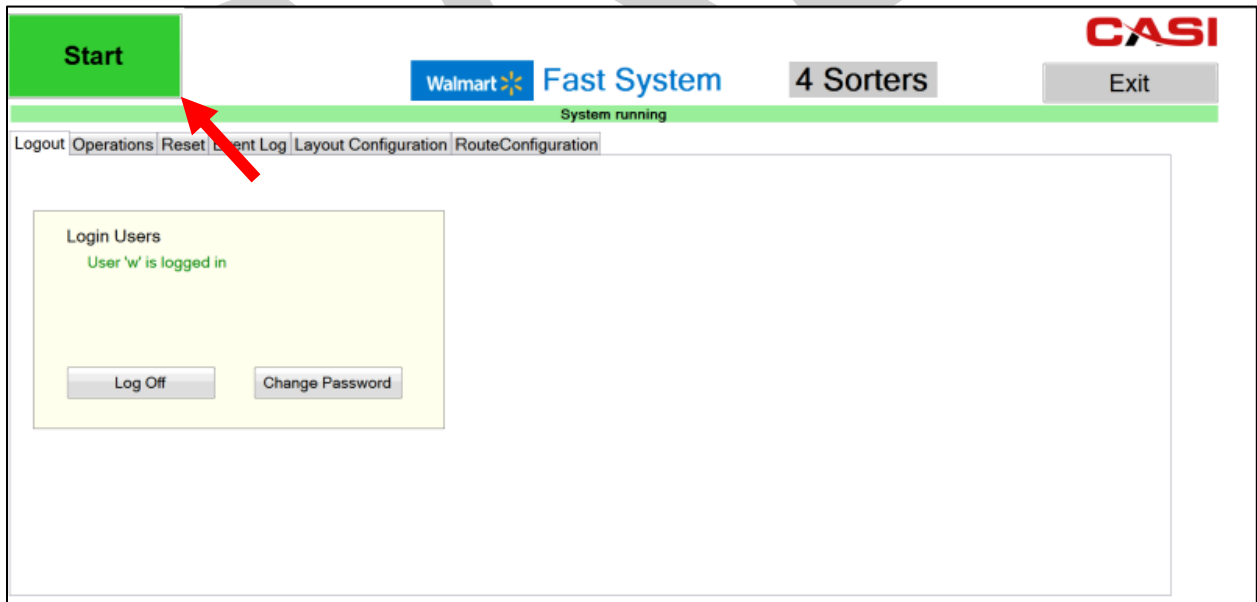


Figure 35 – Startup Screen – Start Button

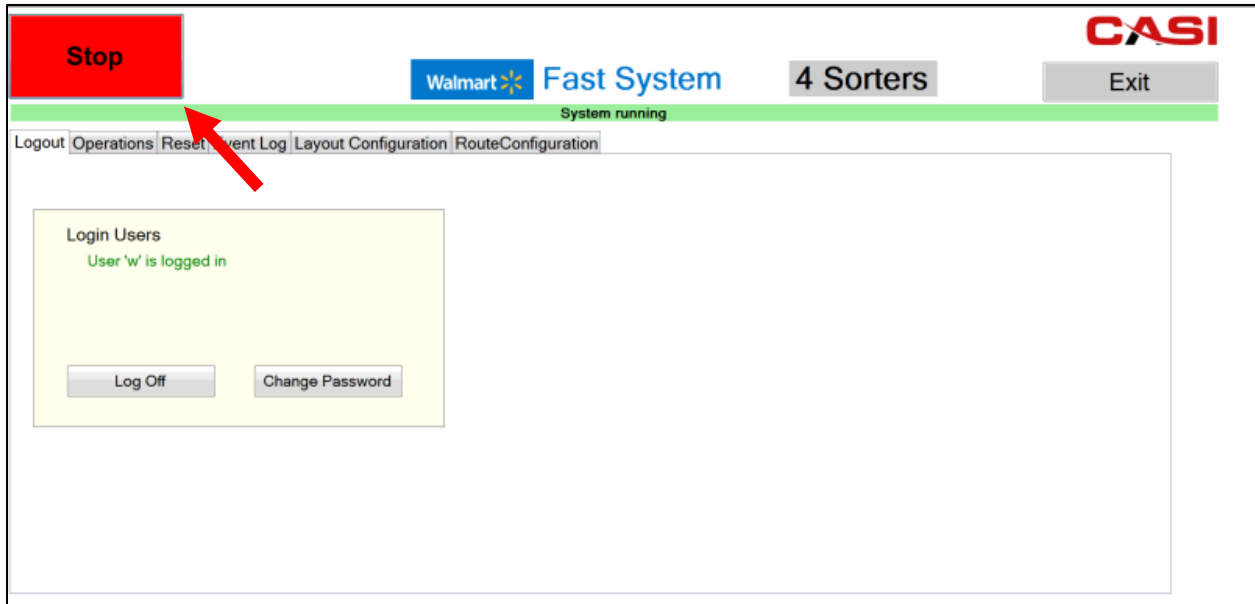


Figure 36 – Startup Screen – Stop Button

8.8 EMERGENCY STOP (E-STOP) BUTTONS

Ensure all E-Stop buttons are reset throughout the system.



IMPORTANT NOTICE: If any of the system E-Stops are engaged, the entire System will be disabled.

8.9 OPERATIONS TAB

The **Operations** screen shows a list of available trucks (trailers) to be unloaded.

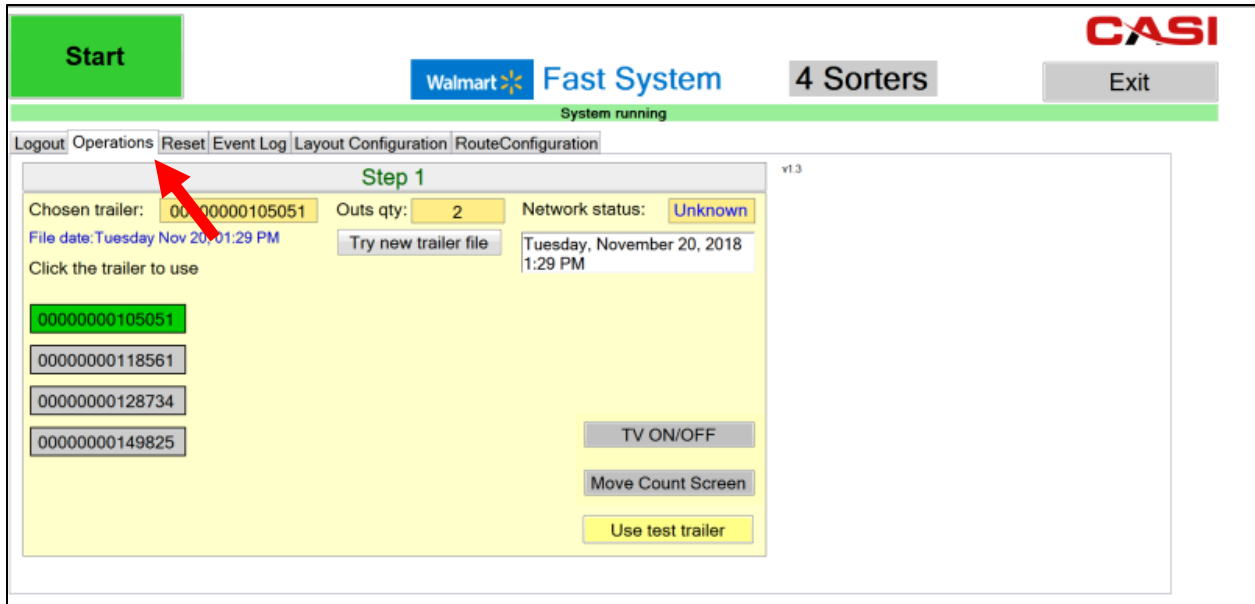


Figure 37 – Operations Screen

8.9.1 USE TEST TRAILER BUTTON

When a system is first commissioned, the first step is to use a test trailer and run test boxes that have matching barcodes, so that the system can be tested before production use. This button may also be used during maintenance of the system.

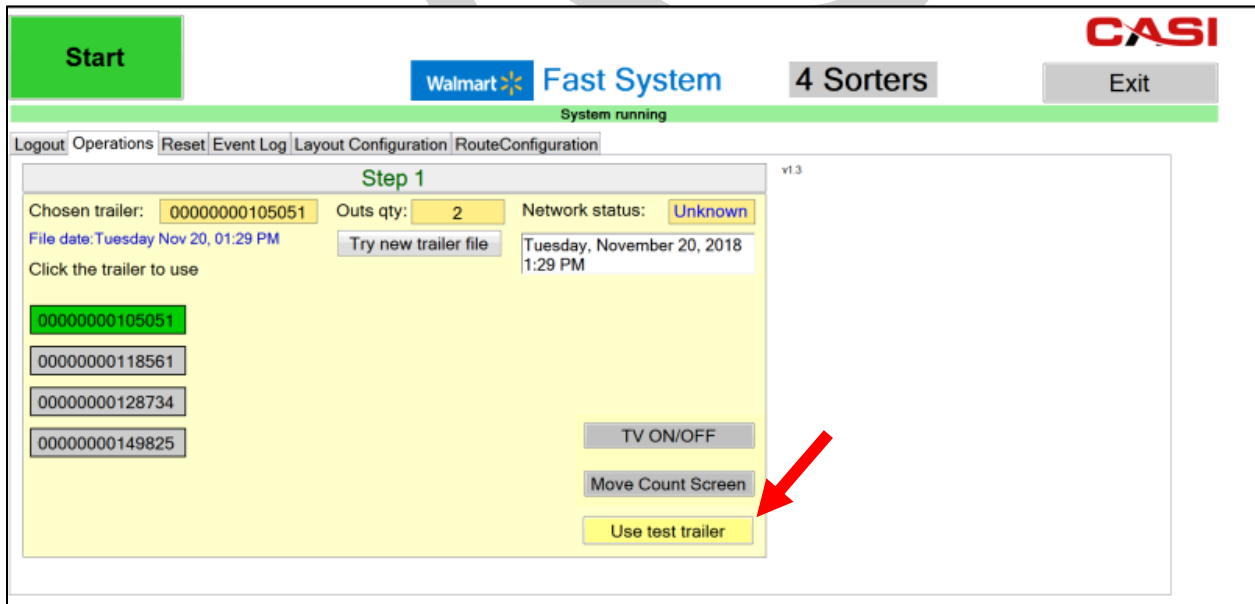


Figure 38 – Use Test Trailer Button

8.9.2 TEST TRAILER IN USE MESSAGE

During the testing of a new system, the **Test trailer in use** message will show on the screen.

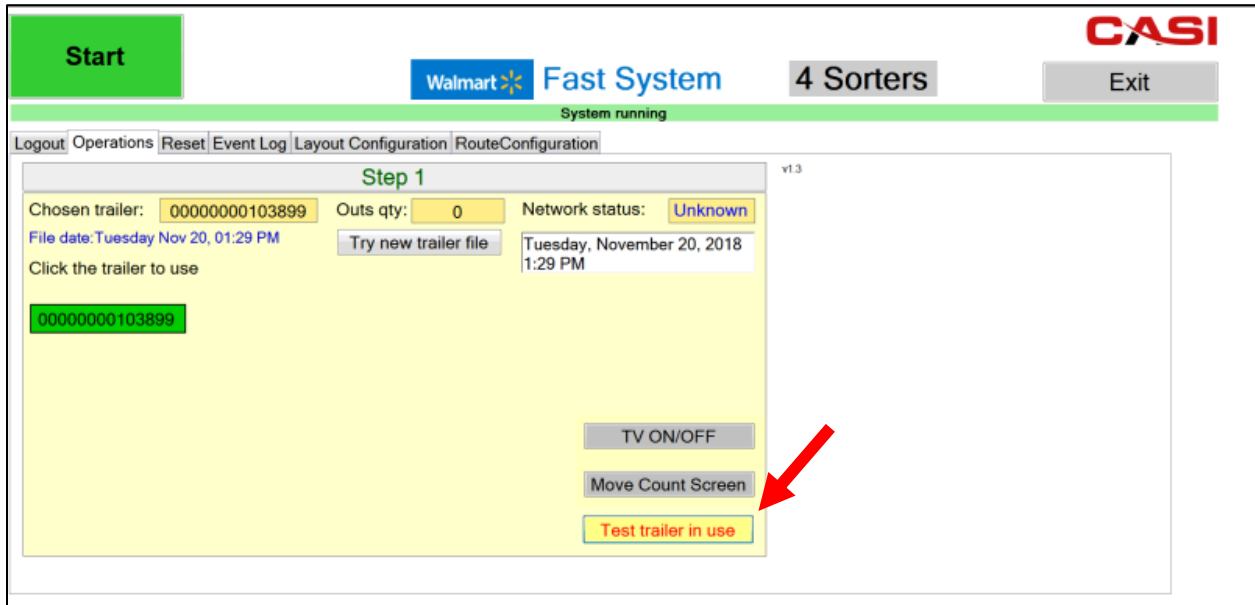


Figure 39 – Operations Screen – Test Trailer in Use Message

8.9.3 OPERATING THE SYSTEM

Follow these steps for Operation:

1. Choose a Trailer from those listed. The trailer number will be listed in the **Chosen trailer** textbox.
2. Click the **Start** button.

Note: If you don't see a trailer list, click the **Try new trailer file** button.

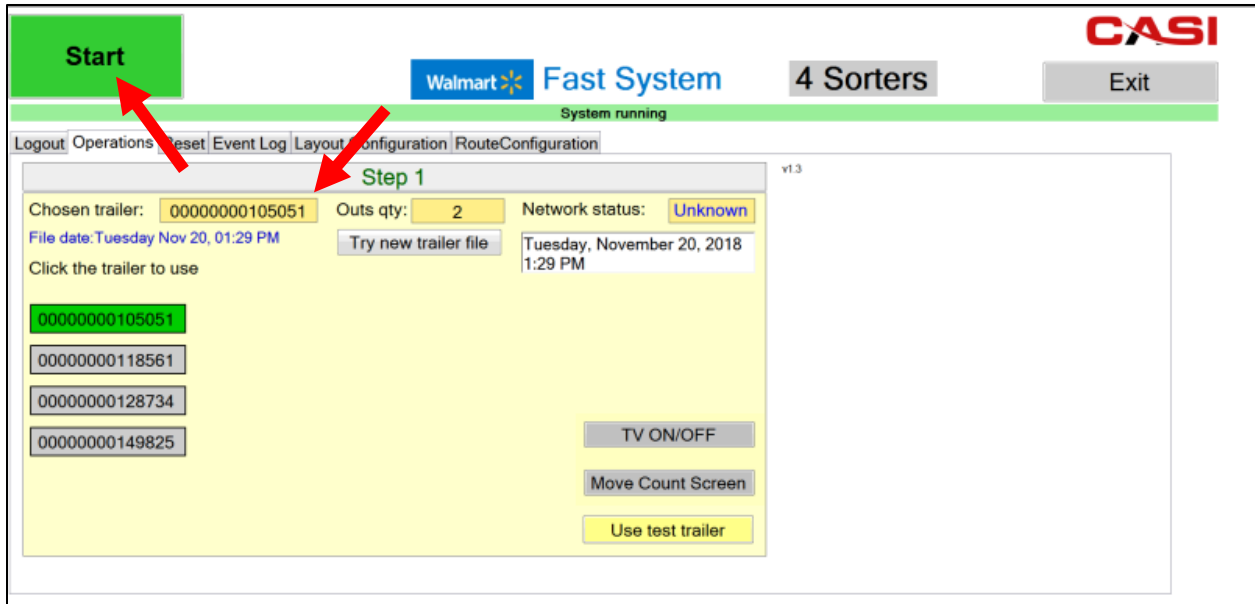


Figure 40 – Choosing a Trailer

8.9.4 TRY NEW TRAILER FILE BUTTON

If an expected trailer is not listed, follow these steps:

1. Click the **Try new trailer file** Button.

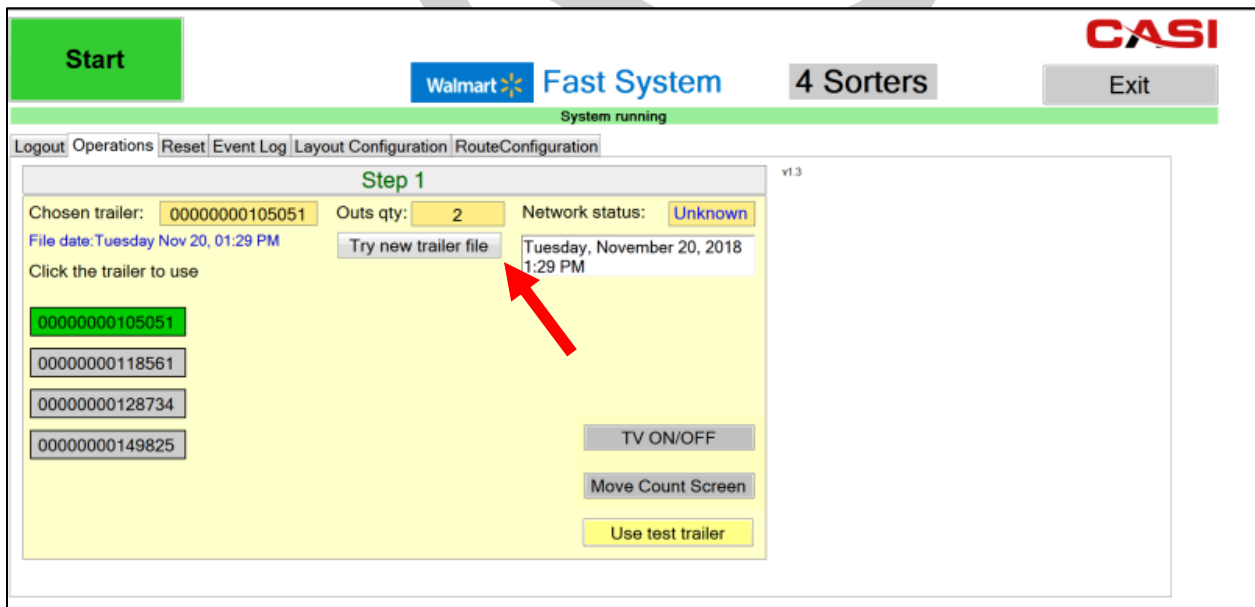


Figure 41 – Try New Trailer File Button

2. On the popup screen, click **Yes**.

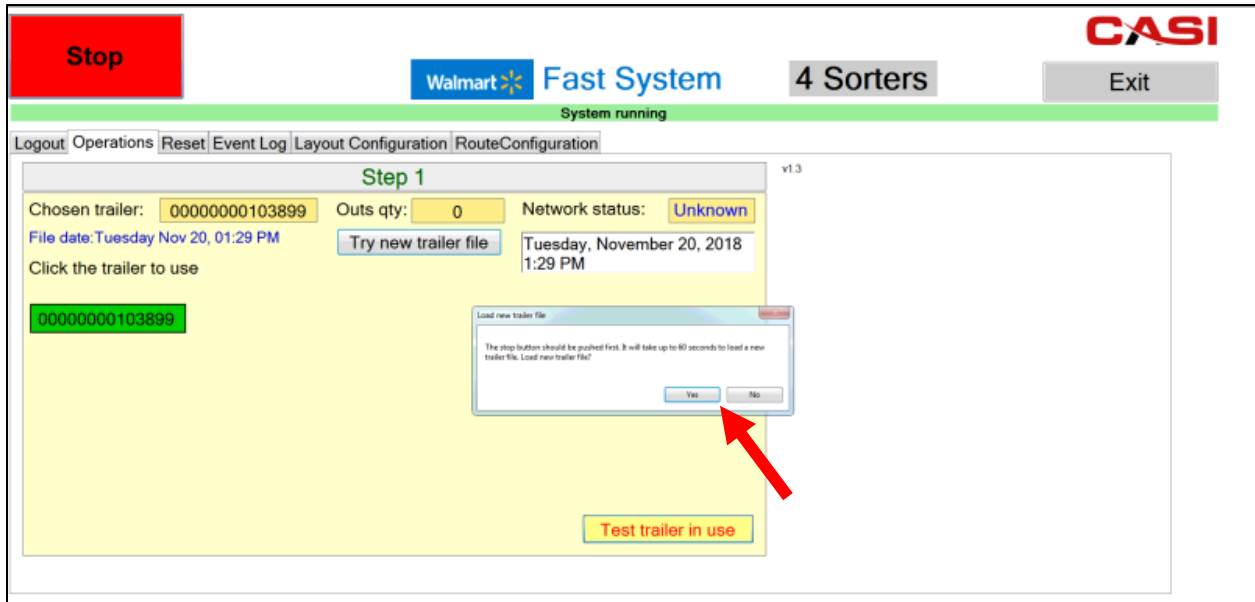


Figure 42 – Try New Trailer File – Popup Message

The system will download a new trailer file, which takes approximately 120 seconds. A progress bar will display the time elapsed in seconds.

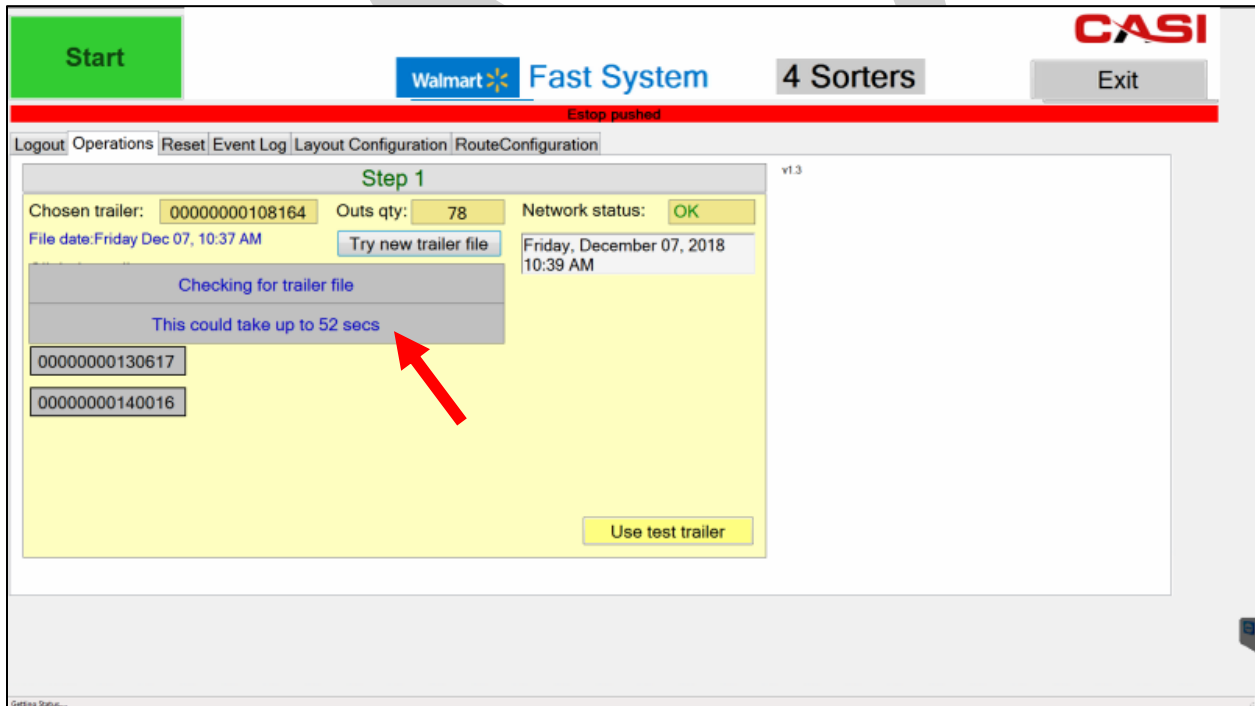


Figure 43 – Try New Trailer File – Progress Bar

8.10 RESET TAB

The **Reset** screen allows the System Administrator to restart the software.

Important Note: This should only be done after all other troubleshooting efforts have failed to solve the problem.

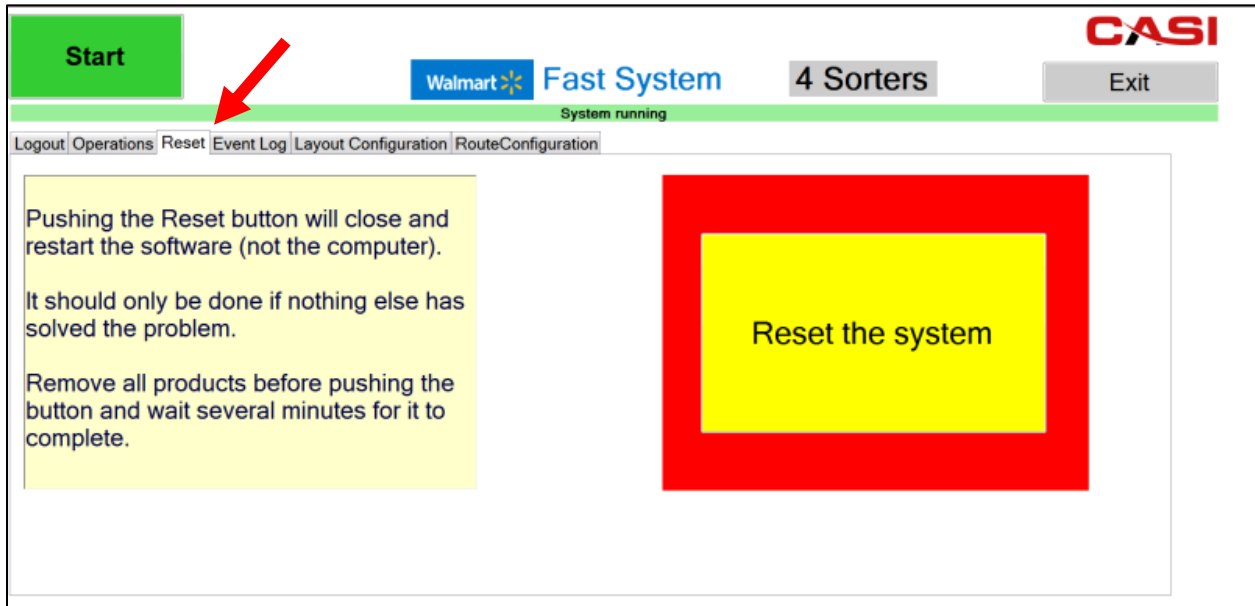


Figure 44 – Reset Screen

To reset the software, follow these steps:

1. Remove all boxes from the system before restarting.
2. Click the **Reset the System** button.

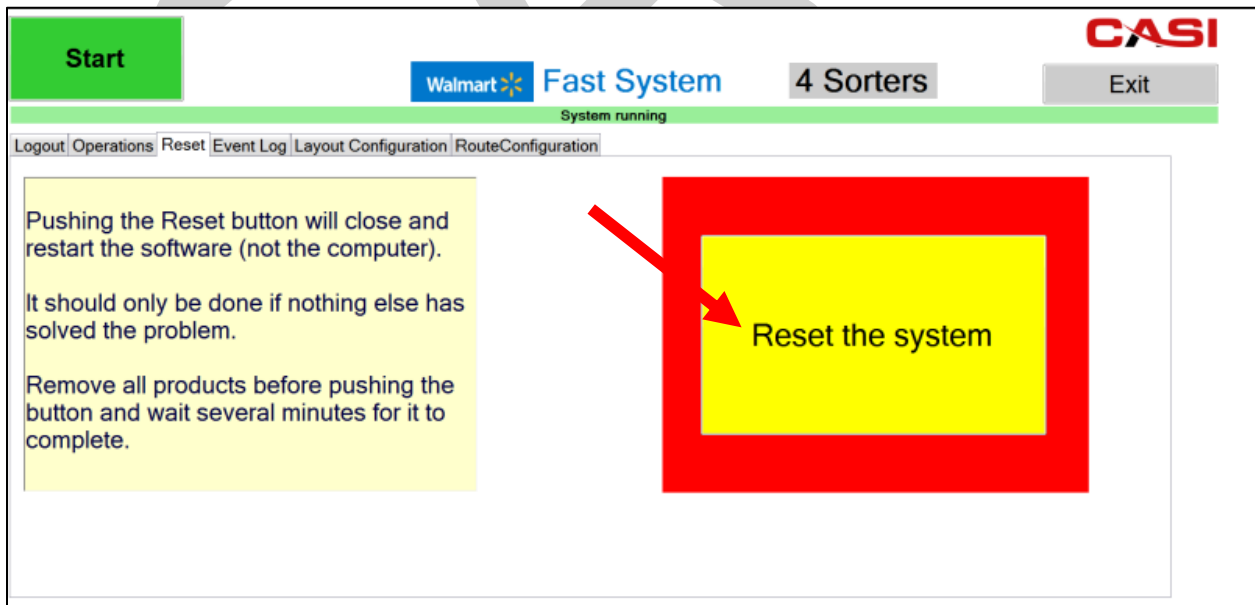


Figure 45 – Reset the System Button

3. On the popup message, **Are you sure?**, click **Yes**.

4. Wait several minutes for restart procedure to complete.

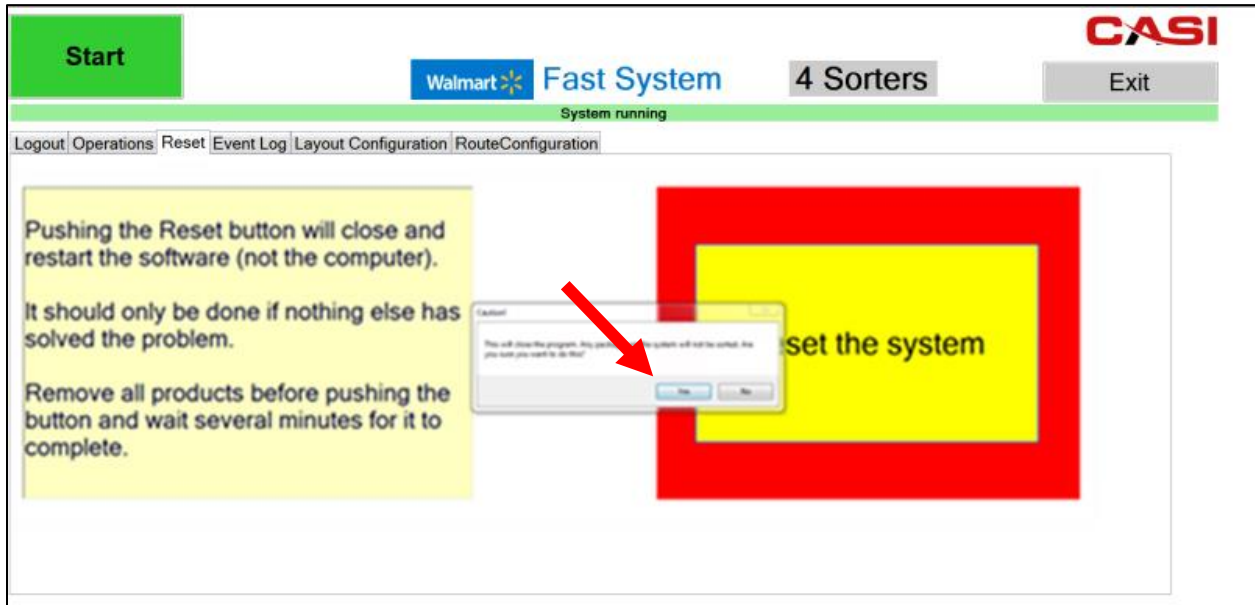


Figure 46 – Reset the System Popup Message

8.11 WEBVISUALIZATION (WEBVISU) SOFTWARE

The WebVisualization (WebVisu) software is viewed on the large monitor downstream of the Scanning Module. It allows operators with a means of easily monitoring the system status.

Internet Explorer is used for the WebVisu software. It starts automatically when the CASI CORE HMI is started. The software screen displays on the large TV monitor on the back of the Scanning Module.

8.11.1 TURNING ON THE LARGE TV MONITOR

1. After logging in, go to the **Operations** tab.
2. Click on the **TV ON/OFF** button.

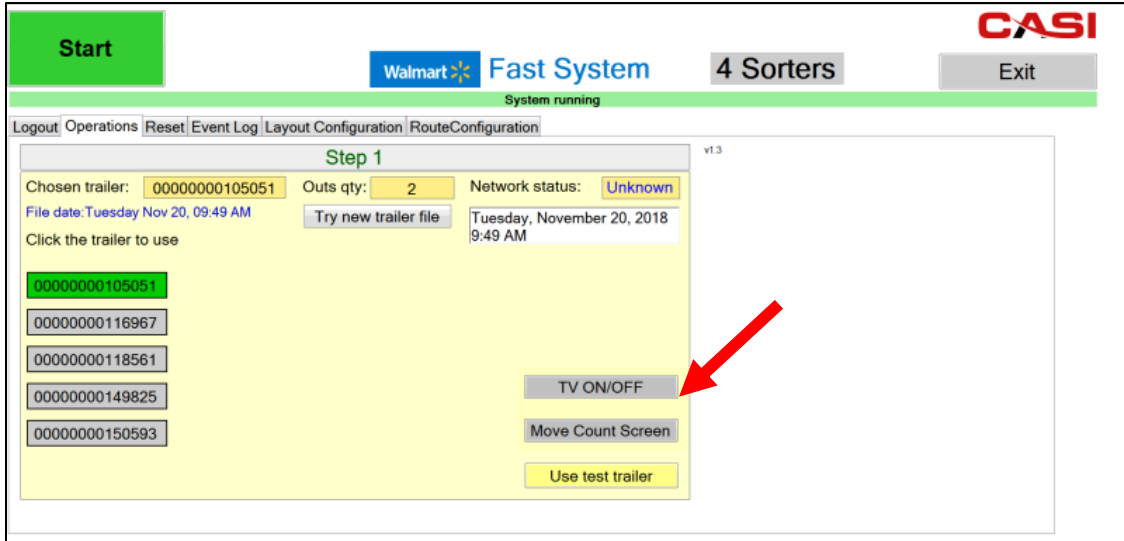


Figure 47 – Operations Screen – TV ON/OFF Button

If the WebVisu software does not display on the large monitor, click the **Move Count Screen** button.

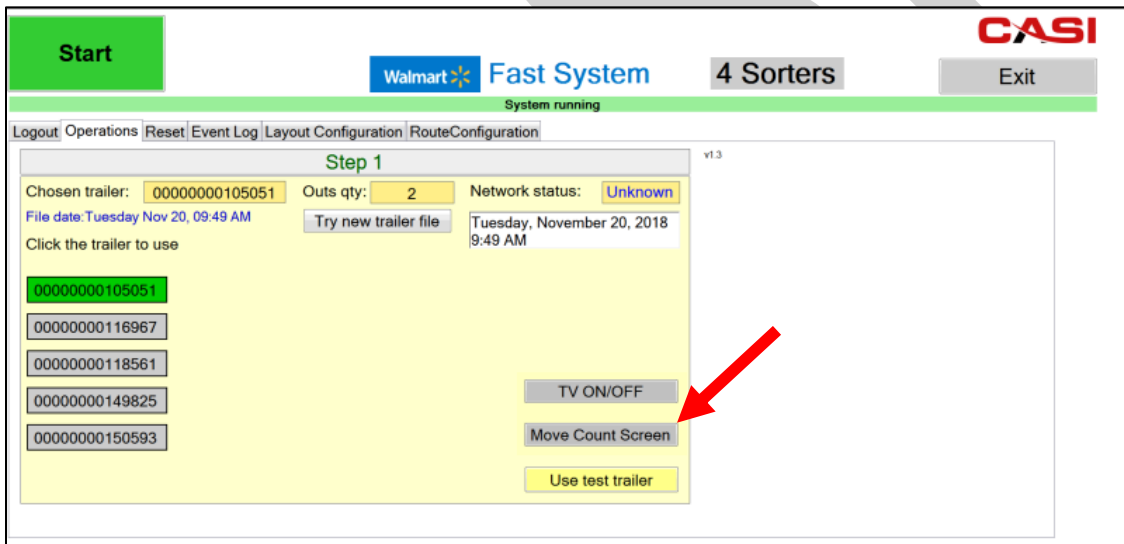


Figure 48 – Operations Screen – Move Count Screen Button

8.11.2 TV MONITOR WEBVISU SOFTWARE DISPLAY SCREENS

The WebVisu software screen displays the following:

1. Box Count
2. System Layout
3. Error message and location, such as **Lane Full** or **Jammed**. This screen displays a general error message. The description of the specific error displays on the CORE HMI.
4. Outs Warnings

8.11.3 BOX COUNT SCREEN

The **Box Count Screen** displays an ongoing count of boxes that have been processed through the system.



Figure 49 – WebVisu Screen

8.11.4 LANE FULL / JAMMED SCREEN

The Lane Full / Jammed Screen displays a message if a lane is full or if the system jams. The lane or jam must be cleared for normal operation to resume.



Figure 50 – WebVisu Screen with Error Displayed

8.11.5 OUTS WARNING SCREEN

Outs are products that should be taken out to the floor quickly. The **Outs Warning Screen** displays reminders that are set on a timer.

1. When the system is started an “Outs Warning” timer will be started.
2. The initial length of the timer will be 20 minutes but will be configurable. The configuration will be controlled by two parameters in the master FAST software.
 - a. Test Systems – These will be configurable via WebVisu as we fine tun the parameters.
3. When the timer times out the following will occur.
 - a. A pop up will appear in the lower right-hand corner of the TV reminding the unloaders to move the outs to the floor.
 - b. An audible message, “Please move outs to floor” will be played.
 - c. A “Warning Active” timer will be started.
4. The message and popup will be active for 60 seconds. This time will also be configurable as described above. When the timer times out the pop up disappears, and the audible warning is turned off.
5. After the Warning Active time has expired the Outs Warning timer will restart.
6. During a two-hour unload this will provide 6 reminders.

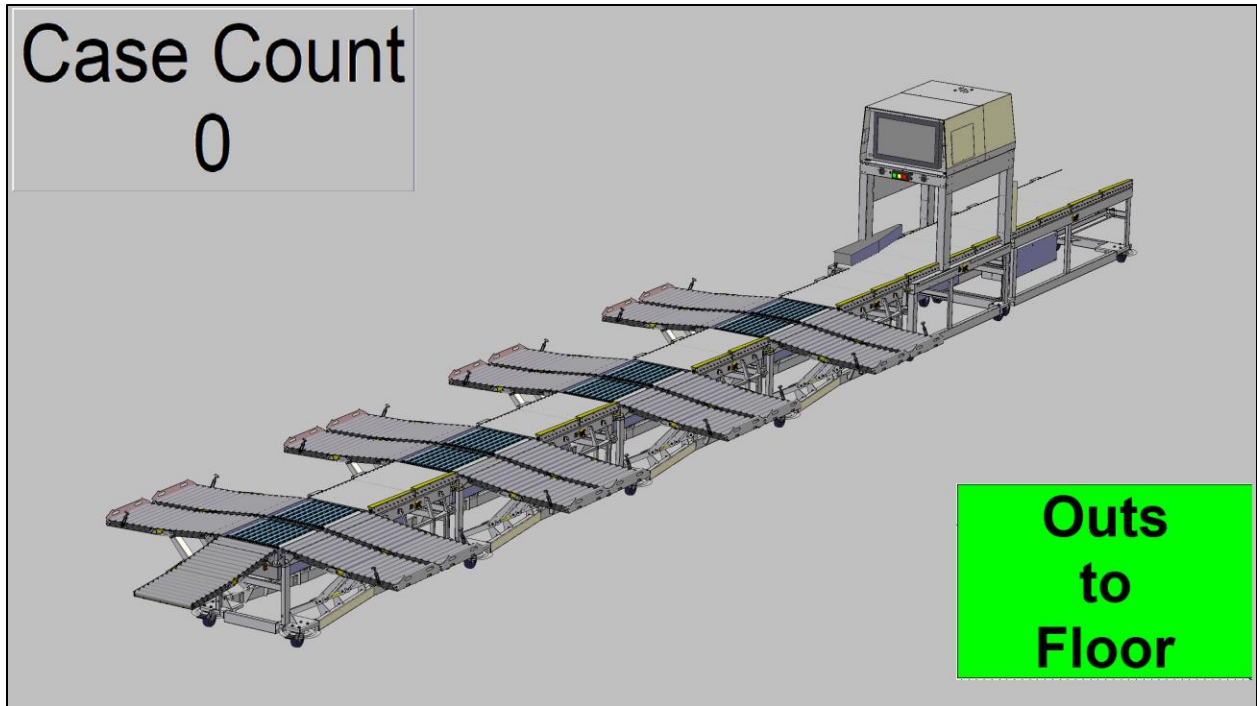


Figure 51 – Outs Warning Screen

8.12 EVENT LOG TAB

The **Event Log** tab displays the status of real-time system events. The Event Log screen is a dynamic, view-only page that continually updates.

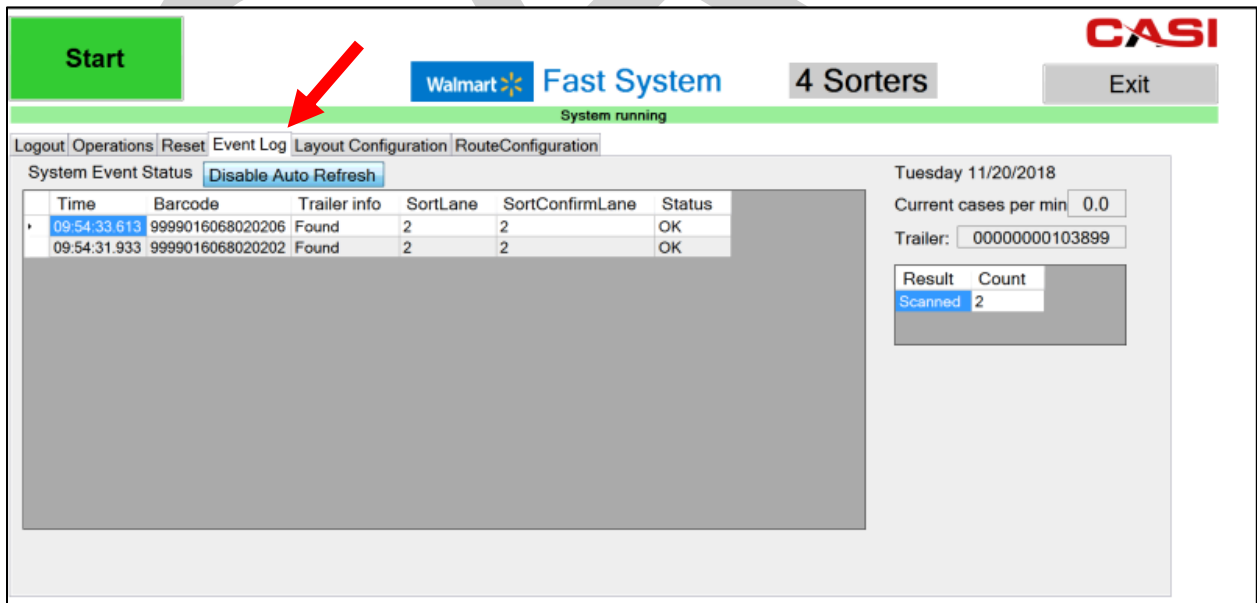


Figure 52 – Event Log Screen

The **Disable Auto Refresh** toggle button enables you to refresh or disable automatic updating.

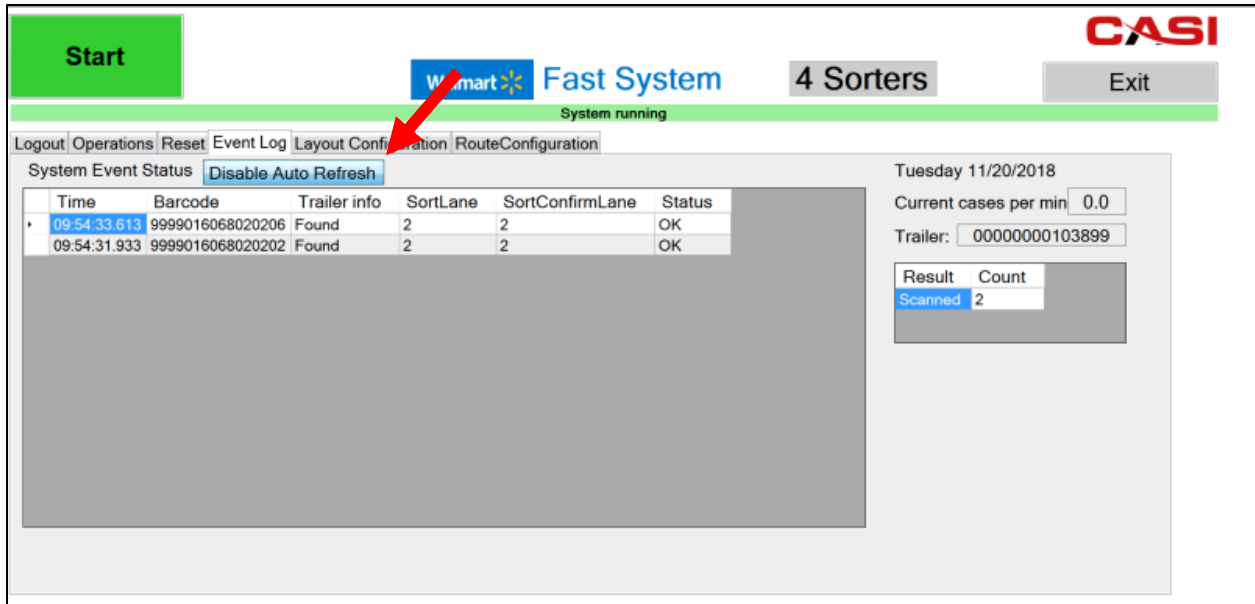


Figure 53 – Event Log Screen – Disable Auto Refresh Button

This button toggles to an **Enable Auto Refresh** button.

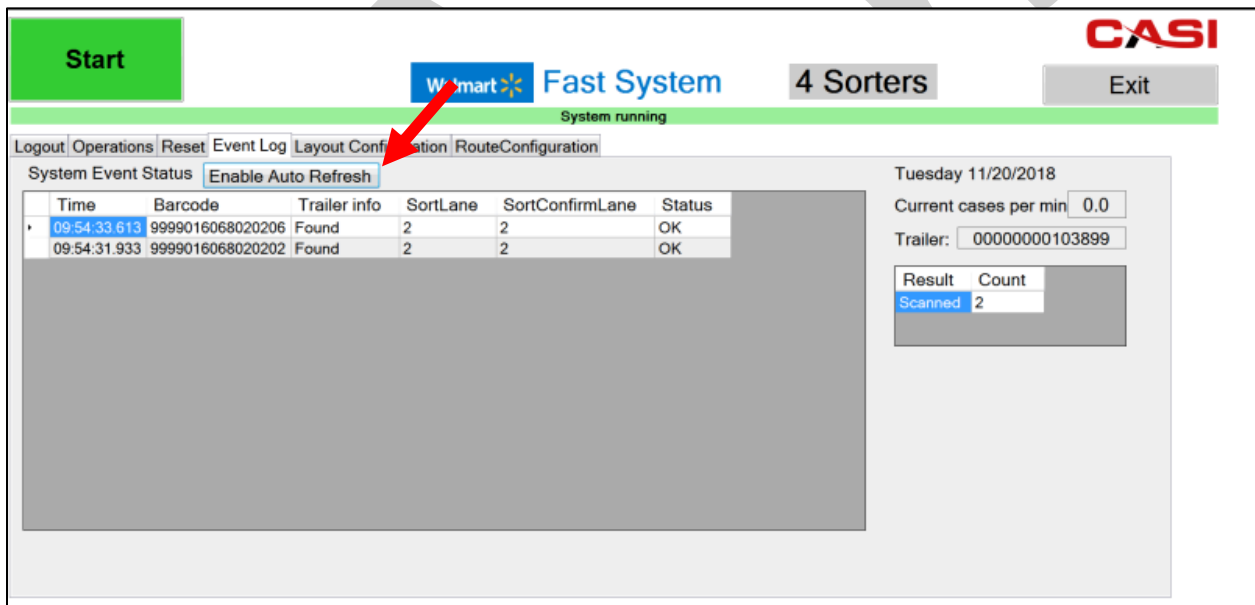


Figure 54 – Event Log Screen – Enable Auto Refresh Button

The following table defines the System Event Status fields on the Event Log screen.

Table 8 – Event Log Fields and Definitions

Field	Definition
Time	The time of the event.

Field	Definition
Barcode	The barcode number on the box associated with the event.
Trailer Info	Shows that sorting information for a barcode was found.
SortLane	The lane the system intends to move the box to.
SortConfirmLane	Verification that the box in the event was sorted to the correct lane.
Status	The status of the event.

8.13 LAYOUT CONFIGURATION TAB

The **Layout Configuration** screen displays the system layout, based on the number of sorter modules recognized by the software. Only the System Administrator can view the Layout Configuration screen.

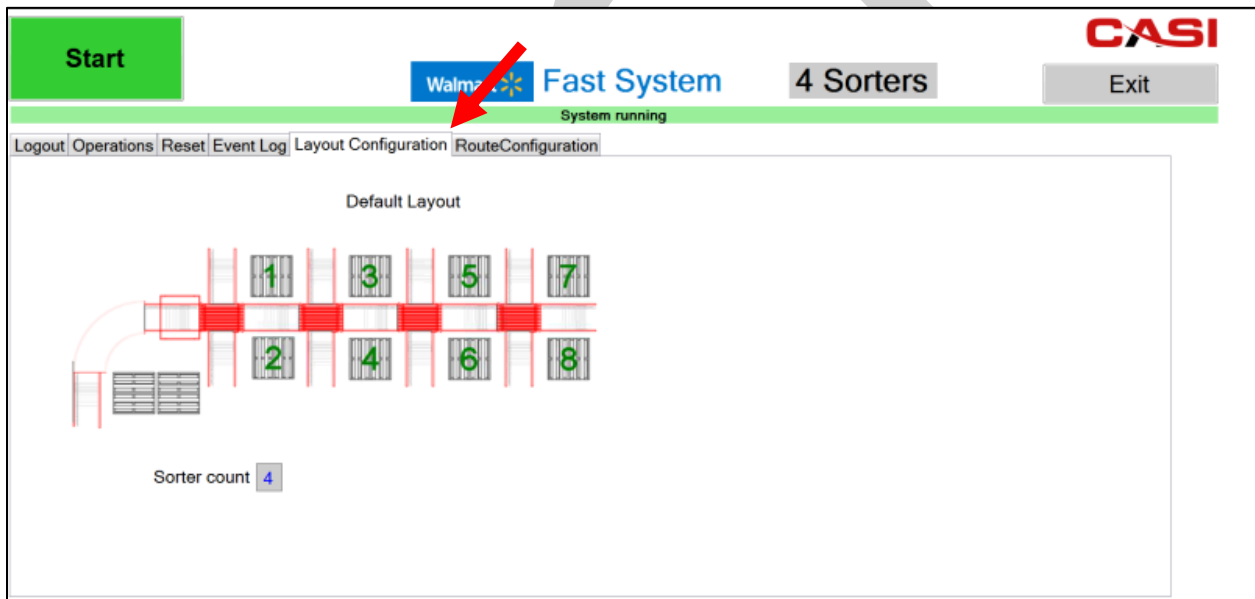


Figure 55 – Layout Configuration Screen

8.14 CLOSING THE CASI FLEXIBLE AUTOMATED SORTING TECHNOLOGY (FAST) SOFTWARE

To **CLOSE** the CASI Flexible Automated Sorting Technology (FAST) software follow these steps:

1. Click the red **Stop** pushbutton on the CASI Main User Interface screen. This will **stop** all system operations and the button will toggle (change) into a green **Start** pushbutton.

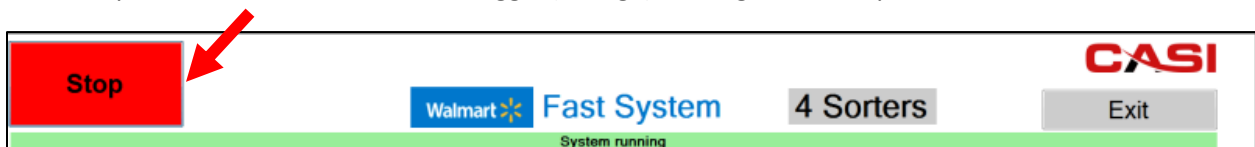


Figure 56 – Stopping the System Software

2. Click the **Exit** button located near the top right corner of the screen.

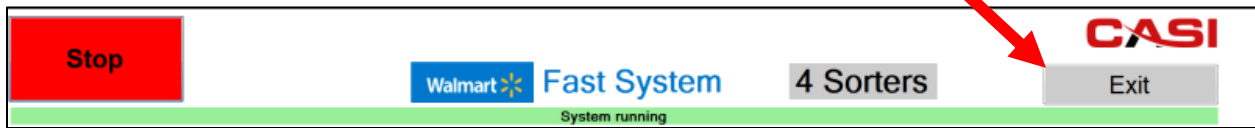


Figure 57 – Exiting the System Software

8.15 SHUTTING DOWN THE SYSTEM

To shut down the system, click the **Windows** icon in the lower left corner of screen.

From the list, select **Shut Down**. Some programs may still be open and upon shutdown you will get a message asking if you want to force shutdown. If so, select the **Force Shutdown** button. It will ask if you are sure, select **Yes**.

The system can now be disassembled and put away in the designated storage area.

9 Service and Maintenance



WARNING: No maintenance should ever be performed until the system has been properly powered down and Lock Out Tag Out (LOTO) procedures implemented. It is the end user's responsibility to establish LOTO procedures that meet their facility's safety requirements.

The following tables describe the suggested maintenance for this system, on a **D**aily, **W**eekly, **M**onthly, and **Q**uarterly basis. Certain components are maintained based on hours of use, as indicated. Additional information may be found in the OEM (outside equipment manufacturer's) documentation located in your system documentation binder and on the USB flash drive.

9.1 CLEANING

Table 9 – General System Cleaning Schedule

Item	Description	Frequency			
		D	W	M	Q
Conveyance	Ensure all photoeyes, drive cards and rollers are free of dust and debris which could interfere with normal operation.	X			
Sorters	Ensure all photoeyes, drive cards and rollers are free of dust and debris which could interfere with normal operation.	X			



9.2 GENERAL ELECTRICAL

Table 10 – General Electrical Maintenance Schedule

Item	Description	Frequency			
		D	W	M	Q
Emergency Stop Circuit	Check the functionality of all E-Stop equipment.	X			
Photoeyes/Sensors	Verify photoeyes are functioning.	X			
	Clean photoeye lenses and reflectors with a dry cloth to remove dust.		X		
Electrical Connections	Ensure all electrical connections are in place and fully connected.		X		
Flex Conduit	Ensure any/all flex conduit is free of nicks, cuts, or abrasions.		X		



9.3 GENERAL MECHANICAL

Table 11 – General Mechanical Maintenance Schedule

Item	Description	Frequency			
		D	W	M	Q
Roller Motors  IMPORTANT NOTICE: Refer also to the OEM manual for detailed instructions.	Ensure the Motor Roller fasteners are tight.  CAUTION: Do not turn the Motor Rollers unless the Motor Cable is unplugged. Failure to do so may damage the Motor Drive Card.		X		
System Visual Inspection	Perform visual inspection for broken or damaged components.	X			
Hardware Checks	1. Ensure all nuts and bolts are tight. 2. Ensure belts are snug and do not slip. 3. Ensure Idler rollers are free spinning. 4. Check Roller motors for visible damage.			X	

9.4 CONVEYORS

Table 12 – General Conveyors Maintenance Schedule

Item	Description	Frequency			
		D	W	M	Q
<p>Power Rollers</p>  <p>IMPORTANT NOTICE: Refer also to the OEM manual for detailed instructions.</p>	<p>Tighten any loose Motor Roller fasteners that are found.</p> <p>Ensure the Motor Roller fasteners are tight.</p> <p>CAUTION: Do not turn the Motor Rollers unless the Motor Cable is unplugged. Failure to do so may damage the Motor Drive Card.</p>	X	X		
	Check Roller Drive for visible damage.			X	
	Ensure roller shaft is secured properly.	Annually			
	Dust and dirt in combination with humidity may bridge the electric circuit. Regularly blow off dust and dirt by using low compressed air.	As Needed			
<p>Motor Drive Cards</p>  <p>IMPORTANT NOTICE: Refer also to the OEM manual for detailed instructions.</p>	<p>WITH POWER OFF - Check looseness or backlash of bolts/screws. Tighten them, if necessary.</p>	X			
	Check the drive card leads for visible damage.			X	
	Ensure the screws of the Z-Card are still tight and that the cables are still laid properly and connected to the terminals.	Annually			
	Dust and dirt in combination with humidity may bridge the electric circuit. Regularly blow off dust and dirt by using low compressed air.	As Needed			
Roller Drive Belts	Inspect for wear, replace as necessary.			X	

Item	Description	Frequency			
		D	W	M	Q
Entire Conveyor (Power & Gravity)	Conduct daily and weekly walkthroughs of system. Look for any abnormal action of conveyor, oil leaks (where applicable), unusual noises, etc. Repair at once.	X	X		
Drive Chains	Wipe off grease with solvent and apply clean SAE 20 motor oil. Check tension on the main drive chain (1/4" - 2% (of sprocket centers) movement midway between sprockets). Use straight edge and check sprocket alignment.	Every 500 Hours			
Electric Motors	Remove grease plugs (if supplied on motor) and grease motor bearings sparingly with ball bearing grease.	Every 1000 Hours			
Tread Rollers / Wheels	Make sure all rollers turn freely. Replace any that are dented, warped, binding, etc.	Every 500 Hours			

10 Troubleshooting Guide

10.1 DISCLAIMER



IMPORTANT NOTICE: Please read this document, all manuals for each individual piece of equipment, and other relevant manuals carefully to understand safe maintenance procedures before performing any routine maintenance on any part of the system.

- First and foremost, no maintenance should be performed until the system has been properly powered down and LOTO procedures followed.
- Risk of electric shock, pinch point injury, robotic system energizing and contacting personnel, among other injuries, could occur if the system is operated or maintenance work is performed in an unsafe manner. Care should be taken at all times when working with moving, rotating, and electrically energized machinery.
- All operation and maintenance should be performed by trained and competent individuals.
- The Troubleshooting Guide is intended to provide operators and supervisors assistance in resolving issues while operating the CASI system. Written in an “if-then” style, each problem identified during the installation and start-up of the system is included.
- Additional, specific instructions are provided for a number of systems and sub-systems as separate documents.
- If this first level troubleshooting does not return the system to operation, CASI technical support is available.

CASI Technical Support 800-930-3788

The following tables serve as reference for common issues. For issues not listed, call CASI Technical Support.

10.2 GENERAL TROUBLESHOOTING

Table 13 – General Troubleshooting

Problem	Correction
Clearing a jammed product	<ol style="list-style-type: none">1) Ensure equipment is stopped - LOTO (wait at least 5 seconds to make sure the equipment does not auto start).<ul style="list-style-type: none">• Assess the situation to best determine the cause of product jam.• Clear jammed materials.• Check for damage or loose pieces of product that might later free up and block or re-jam components.2) Restart System on the CASI CORE HMI

10.3 CONVEYORS TROUBLESHOOTING

Table 14 – General Conveyor System Troubleshooting

Issue	Check	Correction
No Zones on the conveyor will run	<ol style="list-style-type: none"> 1. No power to the Power Supply unit 2. No lights on Power Supply 	<ol style="list-style-type: none"> 1. Ensure system power is ON 2. Ensure power supply is properly connected. Check for loose connections and repair or replace any loose or damaged power supplies. 3. Check output power of the power supply.
Individual zone will not run	<ol style="list-style-type: none"> 1. Drive Card problem 2. Bad cable connection to Drive Card 3. Roller Motor defective 	<ol style="list-style-type: none"> 1. Check all drive cards in affected conveyor section. Replace any defective drive cards as necessary. 2. Check all connections on the drive card for any loose or disconnected wires. Repair or replace any wire or connectors, as necessary. 3. Check all roller motors in affected conveyor section. Replace any defective roller motors, as necessary.
	Check Photoeyes	<ol style="list-style-type: none"> 1. Ensure photoeye cable is fully connected to drive card. Inspect cable for cuts or abrasions. Repair or replace as necessary. 2. Ensure photoeye is aligned with the reflector opposite it. Realign, as necessary. 3. Ensure there is no debris or foreign object interfering with the operation of each photoeye.
A zone will not start after accumulation	Check O-rings and/or Poly-V belts	Ensure belts are not stretched, worn or cut. Replace any and all defective belts.



NOTE: For troubleshooting the FMH Flex Conveyors, refer to the FMH Flex Conveyor Operator’s Manual in your System Documentation Binder and on the USB flash drive.

10.4 GENERAL SOFTWARE TROUBLESHOOTING

Table 15 – General Software Troubleshooting

Issue	Check	Correction
<p>Program Nonresponsive</p>	<p>A computer, operating system, software program or driver may stop responding or cause other programs to stop responding because of several possible reasons, such as a confliction of software or hardware resources between two programs, lack of system resources, or a bug in the software or drivers.</p>	<p>To recover from a program that has stopped responding, a user can generally press the CTRL + ALT + DEL keys on his or her keyboards to open the Close Program window or open the Task Manager window and click the End Task button to terminate the program. If another window opens, click the End Task button again to confirm stopping the program.</p>
<p>Runtime Error 53</p>	<p>The runtime message can be caused by:</p> <ul style="list-style-type: none"> • File required by the program to run is not found. • Program needs to be reinstalled or missing file(s) need to be copied back to the computer. 	<p>To recover from a runtime error, first close all open programs associated with CASI software. Reopen programs and, if the issue persists, reboot the CASI CORE controller. If Runtime errors remain unresolved, contact the CASI support staff for further assistance.</p>
<p>Software responsive but conveyor system not responsive</p>	<p>Possible causes:</p> <ul style="list-style-type: none"> • E-Stop has been activated • Communication between CASI software and PLC has been disrupted • System hardware issue 	<p>To resolve this issue:</p> <ol style="list-style-type: none"> 1. Ensure the E-Stop circuit has been reset. 2. Restart all CASI software. 3. Reboot CASI CORE controller. 4. Verify power is being applied to the system (check the breaker in PWD power cabinet).

10.5 SOFTWARE TROUBLESHOOTING

10.5.1 NOTHING STARTS

- Any estops pushed or broken?
- Check the end estop jumper to make sure it is installed.
- Have you chosen a trailer file?
- Press Start button?
- Have you tried restarting the program?
- Can you press and hold (4 seconds) the PLC reset? Did an error message pop up?
 - If yes - reopen the FAST program
 - If No - press again till error message pops up.

10.5.2 PROBLEMS WITH A TEE

- Are there any jams showing up on the front monitor?
- Are the sensors clear? If you flag (wave hand over eyes) do you see the orange indicator light illuminate?
 - If not following cable back to source and make sure still connected
- Can you see anything down inside the sorter that may be jamming the sorter?
- Can you look underneath and see any cables falling out or about to come out
 - Make sure all are seated well and not starting to back out

10.5.3 EVERYTHING GOES TO THE END

- Correct trailer file selected?
- Is the scanner on (do you see the laser beam from the scanner)?
- Are the barcodes up?
- Select the Event Log tab and see what the result message is
 - NO READ - not scanning barcode or scanner is off
- Make sure loader is loading BARCODE up
 - File Information Missing - add on item not included in trailer file
 - Multiple barcodes - more than one barcode is being scanned at a time
- Make sure boxes have a least a 2" gap between them
 - Other Barcode - Wrong barcode read
- Make sure the barcode from the DC is face up.

10.5.4 BOXES PAUSING FOR MORE THAN 3 SECONDS

If boxes pause before a sorter for more than 3 seconds, then continues to the reject lane:

- Inspect the sensor leading into the sorter module, chances are there is a bad sensor
 - Flag each sensor by hand and look for orange indicator light
- If all sensors check out, inspect the underneath of the sorter for any loose wire connections.

10.5.5 MOTOR NOT RUNNING

- Inspect the underneath of the sorter for any loose wire connections.
- Remove the panel under the TEE to inspect the drive cards.

- Make sure they all have power lights on. If not check the green power plug on the Conveylinx drive cards.
- Check that all Sensor/Control/Ethernet Cables/and Motors are firmly seated on the drive card

10.5.6 FRONT MONITOR NOT DISPLAYING ANYTHING

- Make sure the front monitor is on.
 - Make sure correct source/input is selected
- Open Internet explorer and move the Count Screen display to the front monitor.
 - Shift>Windows Key>Right Arrow
 - For more details reference PDF doc "Moving the Count Screen to the TV Display"
- If the PLC count is not changing, close the explorer page and reopen it again.
 - If can't clear, call Tech Support

10.5.7 TRAILER FILE NOT UPDATING

- Has the system been powered down overnight?
- Press Try New Trailer File button a few times
- After a timer done, if new trailer file didn't show, switch to Event Log tab then back to Operations.

10.5.8 FMH FLEXIBLE CONVEYOR NOT WORKING

- Check the main connectors between modules. Disconnect/reconnect.
- Inspect rubber O-rings for missing/damaged/or binding belts on the conveyor.
- Inspect sensors for power lights and clean if dirty.
- Inspect motor and pulley for loose or missing shaft key?

10.5.9 RESETTING PC

- Best way to shut down the PC monitor
 - Windows icon>Shutdown
 - Power up by pressing blue button on side of monitor
- If PC frozen/lock up
 - Press blue button next to monitor until PC shuts down
 - Press blue button once more

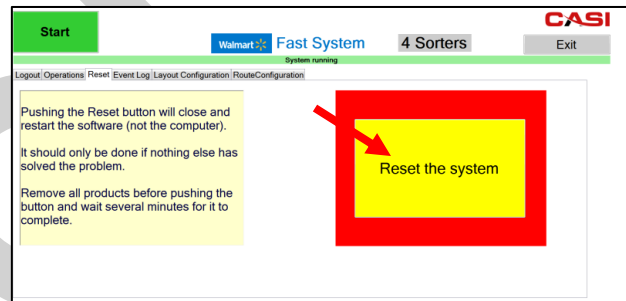
CASI Technical Support 800-930-3788

10.6 SYSTEM TROUBLESHOOTING

1. If a box has stopped on a sorter module or sorter infeed (rollers) and the dome light is yellow:
 - a. Look on the screen and identify the location of the stopped box.
 - b. Remove the box and place in the appropriate location.
 - c. The system will start automatically. (You don't have to push start).
2. If a box has stopped on a sorter module and the dome light is red:
 - a. Check to see if E-stop button(s) are pressed.
 - b. If so, reset E-stop button.
 - c. Press Start.
3. If a box has stopped on a sorter module and the dome light is green:
 - a. Wait and observe, a lane is most likely full and the boxes will move once a lane is cleared.

Resetting the Software

1. Select the Reset tab.
 2. Click the Reset the System button.
On the popup message, Are you sure?, click Yes.
- a. Pushing the Reset button will close and restart the system and should only be done after all other troubleshooting efforts have failed to solve the problem.
 - b. Remove all boxes before restarting system and wait several minutes for restart procedure to complete.



Removing a Non-Functioning Sorter Module

If a sorter module does not return to operation, follow these steps to remove it from the configuration:

1. Press the E-Stop button.
2. Remove the Sorter Module (Refer to System Tear Down & Put Away procedures).
3. Reset the E-Stop button. This triggers the system to rescan and may take 60 seconds or more.
4. The system is ready to resume operation. Press Start button.
5. Go back through the Daily E-Stop Verification System:
 - A. Press an E-Stop button. It will light up and stay lit until reset.
 - B. Verify that all mechanical functionality stops through the entire system.
 - C. Reset the E-Stop by turning the red pushbutton clockwise and pulling it out.
 - D. Restart the system by clicking the Start button.
 - E. Wait for system to check and initialize the sorters.
 - F. Do this for all E-Stop buttons before beginning normal operation.

Note: If the non-functioning sorter module is the one closest to the reject lane, the E-Stop Terminator cable must be removed from that sorter module and then placed on the sorter module that will then be closest to the reject lane.

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