Cayenne Cartoner
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1. Introduction

Overview

The Ilapak CM Cayenne is a small-pitch continuous-motion cartoner that runs continuously on a 12” center and is designed to load one carton at a time. The speed range is up to 150 CPM (cartons per minute).

This manual provides necessary information to enable suitably trained personnel to operate, set up, maintain, and correct recognizable machine problems. This manual has not been prepared to enable inexperienced personnel to operate this piece of equipment without further training. The owner/user is responsible for providing background necessary for inexperienced personnel to safely operate this machine.

The Cayenne features digital servomotors with absolute feedback positioning encoders. The Cayenne cycles in real time, reporting current status at all times. The Cayenne is controlled by Delta Systems SoftFlow control software running on an industrial PC. Servo motors drive most moving components. The timing and positioning of servo-driven components is adjusted by adjusting the servo motor offset value.
The Cayenne is a complex machine with continuous motion in multiple axes at every point of the system. Safety must be observed at all times during operation and maintenance.

Sequence of Operation

- Operator loads cartons into the carton magazine and places product into buckets.
- Buckets containing product travel toward the cartoner, while photo eyes check the buckets for correct and improper loads. When a load-check photo eye detects a correct load, the carton feed signal is sent to the carton feed unit.
- If a product is out of place, the bucket is tagged as No Product No Push. No carton will be pulled for the bucket, and when it reaches the barrel loader the cam bypass will open so the push arm does not extend, and the product will be dumped at the end of the bucket conveyor.
- The carton magazine indexes cartons toward the magazine throat. When the low-carton supply photo eye is no longer blocked, the system will display a “low-carton supply” message on the control panel.
- If there is product in a bucket, the carton pick assembly will pick a flat, unopened carton from the magazine throat and place it between the leading and trailing lugs of the carton transport.
- The carton transport lugs carry the carton toward the barrel loader. Flap guides control the position of the minor and major flaps so they do not interfere with loading.
- As the barrel loader, product bucket, and carton lug move together, the barrel loader pushes the load from the bucket into the open carton.
- The loaded carton is indexed toward the carton closing section. Flap closing plows close the loading side minor flaps.
- The side tabs are closed by means of servo driven tab kickers.
- Glue guns apply strips of glue to the carton flaps as the cartons index through the glue station.
• Sealed cartons are indexed between compression guides to allow glue to set. The cartons then exit the cartoner on discharge belts.

**Carton Orientation**

The terms length, depth, and width are used when describing carton size changes and machine adjustments. These terms are defined as follows:

- **Length** is the longitudinal dimension measured from the leading edge of the carton to the trailing edge based on the direction of material flow.
- **Depth** is the lateral dimension measured from the operator side of the carton to the far side away from the operator.
- **Width** is the vertical dimension measured from the transport level to the top edge of the carton as it travels through the machine.

![Carton Diagram]

**Specifications**

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Electrical requirements</td>
<td>480 VAC, 3 phase, 30 Amp</td>
</tr>
<tr>
<td>Compressed air requirements</td>
<td>90 psi at 15 scfm</td>
</tr>
<tr>
<td>Packages per minute</td>
<td>150 ppm</td>
</tr>
</tbody>
</table>

**NOTE:** Delta Systems utilizes metric fasteners. Some third-party vendor equipment may use standard fasteners.


System Description

This manual has been organized into sections that reflect the various components and functions of the Cayenne.

- Bucket Conveyor
- Carton Magazine
- Carton Feed
- Carton Transport
- Barrel Loader
- Gluing and Closing
- Discharge

Bucket Conveyor

The servo-driven bucket conveyor moves product in buckets from the hand feeding section to the loading section. The buckets are held on two moving chains. The 2 chains are driven by separate servo motors and the bucket size can be adjusted through settings on the touch screen.
The Product Detect photo eye looks through the bucket to determine if a product is present. If so, the control receives a signal to pull a carton from the magazine to match this product at the loading station.

**Carton Magazine**

The operator-fed horizontal carton magazine holds a stack of unopened flat cartons for pickup by the carton pick assembly. The magazine features a motor-driven belt with notches to hold the cartons at the correct angle to enter the throat. The throat keeps the cartons from falling out of the magazine by adjustable hold-back fingers with top and side guide rails.

When the low carton supply photo eye is no longer blocked, the belt motor is signaled to move more cartons into the throat. When the carton magazine prime photo eye is no longer blocked, a low-carton supply message will appear on the Main Display and the amber warning light will illuminate to alert the operator to stack cartons on the magazine. If the system counts a preset number of carton picks after the low-carton supply condition occurs, the machine will auto-stop until the operator refills the magazine.
Carton Picker Assembly

Individual cartons are picked from the magazine throat by a rotary carton picker. The servo-driven carton pick has Three planetary shafts that rotate and position 3 vacuum cups to the front carton. Vacuum is applied to the vacuum cup assembly at the point of the arm end-stroke when the system calls for a carton. The arm then carries the flat carton downward across two carton feed guides and into the leading and trailing lugs of the carton transport. The carton is forced open by the pressure against the feed guides and the moving lugs.

Carton Transport

Four servo-driven lug chains carry cartons from the carton feed area to the discharge lug. The carton is placed between the datum lug and the phase lug. The datum lug (taller) is a fixed position. The phase lug (shorter) position is adjustable for different lengths of cartons. The lug chain speed is controlled on the Main Display. The top rail provides stability to the cartons traveling through the machine.
On the non-loading side of the machine, a servo-driven minor flap closing tucker catches the trailing minor flap and rolls it under the stationary minor flap guide. On the non-loading side of the machine, the major flaps are guided out of the way by stationary flap guides.

On the loading side, the end of the stationary loading guide catches the lower major flap and forces it under the guide. The lower major flap is held under the loading guide until the carton is past the barrel loader.

**Barrel Loader**

The servo-driven barrel loader carries 10 loading slide arms which gradually push the product from the infeed bucket into the carton over 3 machine cycles. The barrel loader pusher facing is interchangeable depending on the product and carton size being run.

After loading, a servo-driven minor flap closing tucker mounted on the loading side rotates to close the loading side minor flaps in preparation for the glue closing.

**Carton Closing**

The glue unit features flap guides and a single glue gun nozzle per side that fires based on signals from the carton at glue photo eye. A strip of glue will be applied across the closed lower major flap. The upper major flap is plowed down over the glue by entering a curved compression guide situated right after the glue.

When a stop condition occurs, the automatic flap closer cylinder is activated by a solenoid to close the flap over the glue since the cartons are not moving. This eliminates unglued flaps when the machine is restarted.
1. Introduction

Cayenne Cartoner User Manual
Carton Discharge
As the closed carton reaches the end of the compression plates the carton is transported out of the machine by a pair of base discharge belts.

Technical Support
If a machine problem develops that is beyond the scope of this manual and provided OEM documentation to repair, contact the Delta Systems Technical Support department at 800-631-2214. Technical Support is available from 8 a.m. to 5 p.m. Central time (U.S.). Send email inquiries to service@dsarogers.com.

Please have the following information ready when you call:

- Machine and/or control serial number, and software version
- Company name, phone, and fax numbers, and email address if available
- Purchase date
- A brief explanation of the problem and the sequence of events that led to the problem
- Any on-screen messages, especially error codes, related to the problem, i.e. SERCOS diagnostic screen, the Operator Change Log, Alarm Log, etc.

Generally, a Delta Systems representative will return your call the same day with a solution, or to inform you of what progress has been made toward a solution. Every effort will be made to resolve problems using telephone troubleshooting.

If the problem cannot be resolved by telephone and field service is required outside the warranty period, the customer is responsible for any associated expenses at Delta Systems’ published service rates (available on request).

Any field service engineer furnished by Delta shall be subject to customer’s general supervision during the term of any service done for Buyer, and Delta shall have no liability for schedule performance or costs incurred by the customer. If services are requested to assist with installation but Delta does not provide the installation, all labor, materials, and tools required for services shall be furnished by the customer. The customer remains solely responsible for the installation when such services are provided.
**Full Warranty**

<table>
<thead>
<tr>
<th>Warrantor:</th>
<th>Delta Warranty &amp; Spares Dept.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta Systems &amp; Automation, Inc.</td>
<td>Phone: 479-631-2210 x315</td>
</tr>
<tr>
<td>535 W. Dyke Road</td>
<td>Fax: 479-631-7010</td>
</tr>
<tr>
<td>Rogers, AR 72758</td>
<td>e-mail: <a href="mailto:spares@dsarogers.com">spares@dsarogers.com</a></td>
</tr>
<tr>
<td>Phone: 479-631-2210</td>
<td></td>
</tr>
</tbody>
</table>

**Warranty Period**

Any equipment that contains a Delta serial number shall be covered for a full year. That coverage shall begin immediately following the commissioning or reconditioning of the equipment by Delta personnel. Coverage is extended to the company that paid the invoice for the equipment described above. Delta is to be notified of any transfer of equipment to another company or location, and reserves the right to evaluate the equipment so that coverage may extend to the receiver.

**Covered Parts**

All parts on the equipment found to have defects in material or workmanship when operated under normal conditions will be covered. All parts that were bought as an O. E. M. shall have the expressed warranty of the manufacturer. Parts will be replaced or repaired at the option of Delta Systems without charges for parts or labor.

**Parts Not Covered**

Normal wear on items such as vacuum cups, glue nozzles, infeed buckets, and drive belts are not covered. Damage to parts due to negligence or abuse is not covered. It is expected that a reasonable preventative maintenance program will be followed for parts that require care. This is expected regardless of omissions in the equipment manuals.

**Filing for Coverage**

A Returned Merchandise Authorization (RMA) Form must be filled out and filed with Delta Spares & Warranty Department before processing can begin on a claim. An RMA number will be issued so that parts can be returned to Delta, or routed to the manufacturer for warranty evaluation. Processing priority shall be determined on a case-by-case basis depending on the situation and the size and cost of the parts.

**Denial of Claims**

An invoice will be issued and sent to the customer for any parts that are denied coverage as above. Any formal declarations produced from the manufacturer leading to denial of coverage will be included for customer records.

**Return Merchandise Authorization Procedure**

Delta Systems & Automation, Inc. is committed to offering our customers the best Quality Service that will meet or exceed your expectations. The following procedure is to insure we make it as
convenient as possible for all return merchandise. Please review and follow the instructions when a return is needed.

**Warranty Items**

Delta Systems & Automation, Inc. has placed a one-year warranty on all machines. Some electrical items fall under a two-year warranty. These two-year items will need to be determined at the time of request.

- Complete the Return Merchandise Authorization Form on page 4 (Delta Systems, Inc.-RMA-Rev3)
- Fax the form to the number at the top of the RMA Form.
- Delta Systems Spares and Warranty Department will review the return issues and fax back a copy with an RMA number.
- Ship all returns to the address shown at the bottom of the RMA Form.

**Lead Times**

The manufacturer and availability determine lead times. Expediting charges may occur if this item is out of warranty and needed quickly. Generally the lead times are as follows:

- Fabricated Part…….two to three weeks lead-time
- Electrical Part……..one to two weeks lead-time
- Mechanical………..one to three days lead-time

**Key Information Needed**

This information is needed to speed up the return process. If you have any questions on this information please call the number at the top of the RMA Form (see page 4) and ask for the Spares and Warranty Department.

- Part Number
- Job Number (off the Serial Tag located on the machine)
- Serial Number (if available)
- Assembly Number (for full assemblies)
### Basic Information

Note: Entire form must be completed in order to process your Repair Return Request. Serial Numbers must be given on all electrical components before a RMA number can be given.

<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
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<tbody>
<tr>
<td>RMA Contact Person</td>
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<tr>
<td>Company</td>
<td></td>
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<tr>
<td>Date</td>
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<td>Telephone</td>
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<td>Fax</td>
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<td>E-Mail</td>
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<td>Bill to Address (If Out of Warranty)</td>
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<tr>
<td>Address</td>
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<td>Country</td>
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### Return Items

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Did the product work properly when you received it? Yes No

Have any changes been made to the product, application or operating system since last working? Yes No

**Changes Made**

<table>
<thead>
<tr>
<th>Warranty Repair</th>
<th>Non-Warranty Repair</th>
<th>Quote Before Repair</th>
</tr>
</thead>
</table>

Date: ____________________________

Signature: _______________________

Please Ship Returns To:
Delta Systems & Automation, Inc.
Attention: Spares and Warranty
535 West Dyke Road
Rogers, AR 72756

Delta Systems & Automation, Inc.-RMA-Rev 3
Safety

Training

Machinery may be hazardous if safety precautions are not followed. All operators and maintenance personnel must be fully trained and supervised about safe and correct machine operation.

Be sure all supervisors read and understand the entire contents of this operation manual. Be certain that anyone who works on or around the machine reads and fully understands the safety precautions noted throughout this manual.

- The responsibility for safe machine operation is shared among the employer, supervisor, operator, attendant, and all maintenance personnel who work with the machine. Read the instructions. Re-read them periodically.
- Accident prevention should be continually evaluated. This means all potential hazards must be identified and either eliminated or safe-guarded. Along with creating safe conditions, safe practices should be followed by all employees.
- If you ever have any questions regarding the safe operation or maintenance of this machine contact Delta Systems.

Warnings

Throughout this manual, important information will be highlighted, and will be marked as a NOTE, CAUTION, or WARNING.

---

**NOTE:** information that is important to the proper operation of the machine.

**CAUTION:** information that is important to prevent damage to the machine.

**WARNING:** information that is important to prevent personal injury or severe machine damage.

---

This manual assumes that personnel using the control are familiar with and follow standard safety practices. The following safety precautions must be followed:

- Immediately report any accidents.
- Notify your supervisor if machine is not operating properly.
- Use Lock Out Tag Out (LOTO) to remove power before servicing powered equipment or moving components.
- Only trained, authorized personnel may service components inside the Power Cabinet – high voltage equipment presents a serious shock hazard.
- The Power Cabinet door must be closed and latched when operating the machine.
- Always leave covers and guards in place – guards are in place to separate personnel from machinery in motion and prevent injury.
- Never touch the motors, belts, or chains when the machine is in operation.
• Machine areas requiring special attention are marked with Danger, Warning, or Caution signs indicating required action. Take all Danger, Warning, and Caution notices seriously.

• Some machines may start operating automatically when product arrives.

• Only properly trained and qualified personnel should operate this machine and control.

• Operators should always wear appropriate eye and ear protection, and avoid wearing loose clothing.

• Warn co-workers and ensure bystanders are clear of the machine’s moving parts before starting the machine.

• Do not attempt to perform any cleaning while the machine is operating.

• This machine is not intended for use in an explosive environment.

• Several potential burn and pinch points are present on the machine. Use care and observe warning placards during operation and maintenance.

• Ensure all personnel are standing clear of the machine any time an E-stop is reset.

• The computer starts automatically when power is applied to the machine; ensure all personnel are standing clear of the machine during startup.

WARNING: Machinery in motion is inherently dangerous. It is the user's responsibility to implement appropriate safety mechanisms and procedures.
2. Installation

Inspect the Machine

**Note:** Take special care not to damage the machine during moving, unloading or installation.

Follow this checklist when inspecting the machine upon receiving from the shipper.

1. Inspect the machine carefully for any damage that may have occurred during shipping. Check the parts received against the manifest. Report discrepancies to the carrier’s local agent.

2. List any problems on the freight bill. Careful listing of problems on the freight bill will facilitate a settlement if a claim is made.

3. If the damage is too difficult to describe, take photographs of the problem areas.

Position the Machine

This operation requires extreme caution. If you have any doubts about what you are doing, stop and figure it out before proceeding.

- Select a safe and appropriate hoisting method.

- Select lifting equipment that will hold the weight of the machine and any sub-components. Inspect the lifting equipment for safe operating condition.

- Before moving machines on mobile mounts, raise all leveling screws enough to prevent catching or hitting obstructions on the floor. Use extreme caution and warn others to stay away from the machine while hoisting and moving the machine!

- Make sure all auxiliary equipment is in the correct position before positioning or uncrating your machine.

- Before removing skid, locate the main section of the machine in the desired position with respect to its associated equipment.
Uncrate the Machine

Do not uncrate the machine until it is in the correct position on the floor.

- Set aside all sub-assemblies and spare parts.
- Take care not to damage the machine while removing the crating materials.
- Unbolt and/or remove straps, bolts, and other fasteners securing the skid and other crating materials.
- When all shipping materials are removed or released, raise the machine off the skid with forklift or jacks.
- Remove the skid.
- Dispose of the crating materials in a safe manner.

Level the Machine

- Make sure the machine is at the right elevation. The distance from the floor to the top of the machine should be at the height in the specifications.
- Adjust the leveling screws on the base legs (right) to level the cartoner.
- Level the machine both longitudinally and laterally using the main cross braces on the machine as the base for the level.

Assembly

Some components and optional equipment have been removed for shipment. Install the equipment and adjust or position as follows:

1. Attach the additional sections of the machine at those points designated with corresponding letters (i.e., A to A, B to B, etc.). Level each unit with respect to the cartoner (outer bucket conveyor, carton magazine, discharge section).
2. Attach any small parts removed for shipment (i.e., guides chains, guards, etc.). All connecting points will be designed with corresponding letters.
3. Connect compressed air supply (80 - 90 psi).
4. Check all screws, nuts and bolts. Tighten anything loosened during shipment.
5. Check all gear box oil levels. Fill each with the proper lubricant before operating the machine.

**NOTE**: A complete lubrication of this machine was performed prior to shipment. Although lubrication is generally not required during installation, inspect all moving parts for lubrication needs. Refer to the Maintenance section for points to check.
Move the Machine

Follow these steps if it becomes necessary to move the machine to a new location:

1. Center the forks on the floor under the machine without hitting the shafts.
2. Place two blocks on each fork, one at the front and one at the rear under the frame of the machine.
3. Make sure the blocks are high enough so that shafts under the machine will not contact the forks.
4. Raise the forks high enough to clear other equipment on the floor.
5. Drive very slowly to the new machine location.

CAUTION: To prevent damage to components which extend below the frame, (Dim. A), the total height of the blocking, (Dim. B) shall exceed Dimension A.
Apply Power

Energy Sources
All personnel must be familiar with the location of energy sources and controls on the cartoner as shown below.

Connect Electrical Power
All major electrical and computer components are typically contained within the lower power cabinet, located on the rear of the frame. Some cartoners may be customized with additional cabinets for electrical components.

The cartoner requires 480 VAC for proper operation unless otherwise specified. Test the incoming power at the installation site to determine the available voltage.

**WARNING:** High voltage is present in the upper Power Cabinet. Only authorized personnel should open and operate in this cabinet.

When all other machine preparations are complete, connect an appropriate 480 VAC, 3-phase, 30-amp power supply to the Main Disconnect and the grounding block (see Figure 2.12). Delta Systems does not typically provide an access port to the Power Cabinet. The customer must create power access into the cabinet to best match positioning of the available power supply.

Installation must comply with all applicable local, state, and federal electrical codes. It is highly recommended that a certified electrician complete the electrical installation.
Connect Pneumatics

Connect the plant air supply to the pneumatic port located on the back of the machine frame below the carton picker assembly. To connect the air system, insert the supply hose into the pneumatic port (right). To remove, use a finger to push back the bushing on the port and remove the hose.

The air supply should be clean, dry, and filtered at a pressure of approximately 90psi.

Pre-Start Checks

After completing the cleaning and assembly steps in this section, make a pre-start check.

1. Visually check all moving parts and remove any foreign material that could bind or jam the machine.
2. Rotate all axis motors to ensure there is no binding or misalignment from installation and/or shipping.
3. If the machine jams or binds, re-inspect all moving parts and adjustments.
4. Remove cause of jam or binding.
5. Ensure all belts, chains, guides, etc. are properly installed and secure.
6. All footpads are in contact with the floor, and the machine, infeed, and downstream conveyor are level and square.
7. Check to ensure all doors and panels are closed.
8. Ensure the E-stop button on the HMI is engaged (pushed in).
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3. Machine Setup

This section describes the machine’s mechanical controls, and preparation for starting the machine. It assumes there are no problems with the machine, no ongoing maintenance or cleaning operations, and that the operator is familiar with horizontal flow wrapping operations.

Main Disconnect

The Main Disconnect switch is located in the right-hand door of the lower Power Cabinet. When 480 VAC is connected to the machine and the switch is turned to ON, power is supplied to the system’s electrical components.
Pneumatic System

The pneumatic system takes shop air, controls the pressure, and distributes it to pneumatically operated components in the system. Air requirement is 80-90 psi at 15 cubic feet per minute (SCFM). The pneumatic system components are mounted on the non-operator side of the machine below the carton pick assembly. Pneumatic components are described below.

The system powers a vacuum unit used in the carton pick assembly. Note that vacuum pressure continues to operate even when an E-Stop is engaged so that any carton in transit will stay attached to the suction cups and won’t be dropped.

The pneumatic pressure sensor senses the supply air pressure. If the pressure drops below the set point pressure the valve will close and trigger an E-stop for low air pressure.

Use the knob on top of the regulator to set pressure to keep the indicator in the green range on the regulator gauge.
Air Multiplier

An air multiplier provides 180 psi pressure to the lug chain auto-tension system.

Air shutoff valve

To manually close the air shutoff valve, rotate the valve 90 degrees CCW. Apply the appropriate lock in accordance with OSHA guidance and company Lockout Tagout policy.
Human Machine Interface Controls

Five buttons on the Human Machine Interface (HMI), below the touchscreen, control starting, stopping, and positioning the machine.

- **Start** – Activates cartoner operations with the current machine settings; the alarm horn will sound for 3 seconds before machine motion begins.
- **Stop** – Stops machine operation at the end of the current cycle.
- **Jog** – Press and hold to reposition the machine axes; the alarm horn will sound for 3 seconds before motion begins. Release the button to stop machine motion.
- **Reset** – Must be pressed after E-stop activation to clear any faults and re-engage the main contactor.
- **Emergency Stop** – Press E-stop to instantly stop machine operations by removing power to the main contactor. E-stop is not intended for use as a cycle stop or routine method to stop the machine. (see Emergency Stop section for more information.)

**Emergency Stop**

Pressing the Emergency Stop (E-stop) button immediately removes power from all axis drive and motors. Use the E-stop if you must immediately stop the machine for an emergency. All other times use the Stop button to halt the machine. Pressing the E-stop does not turn off the computer, but removes power from the main contactor.

The system provides three E-stop buttons as shown below: at the bucket conveyor loading section, on the HMI, and at the discharge lug. Pressing any of these will immediately stop the system.

**CAUTION:** When the cartoner is operating, do not use the E-stop unless absolutely necessary. The cartoner should always be stopped with the Stop button unless there is an emergency.

To resume operations after the E-stop has been pressed, pull out the E-stop button and press the Reset button. If the machine does not reset, press the Start button; a pop-up message on the Main Display will provide a message indicating why the reset failed. If there are more than one E-stop buttons on the machine and its associated equipment, any one will halt machine operation.

**WARNING:** Ensure all personnel are clear of the machine any time an E-stop is reset.
Safety Switches

Safety switches are installed on four components; locations are depicted in the drawing above:

- Front carton pick assembly door
- Front mesh cover
- Rear carton pick assembly door
- Rear barrel loader assembly door

Opening any of the covers will result in an E-stop condition and halt the system. Do not open any cover or door while the machine is in operation.

**WARNING:** Significant personal injury hazard exists from machinery in motion during system operations. Do not attempt to reach beyond any cover unless the machine is in an E-Stop condition.

Alarms

**Light Stack**

A light stack mounted on top of the power cabinet provides visual indications of machine status as follows:

- Solid Green – starting, running, jogging
- Flashing Green – ready to run
- Flashed Red – cycle stop or critical fault
- Solid Red – E-stop engaged
- Solid Amber – waiting for downstream or non-critical fault
- Flashing Blue – low carton supply

**Horn**

An audible horn is mounted at the top of the light stack. The horn sounds when an E-stop is activated, or when any axis motion begins by starting or jogging.

**Photo Eyes**

A photo eye is an electronic device that scans a direct path of light either between the cell and a reflective surface or through another cell. When there is any interruption of the beam by a solid object (or by a gap between solid objects), the photo eye will change state. There are three basic types of photo eyes, each one designed to serve a special purpose.

**Thru-Beam** – the thru-beam type of photo eye consists of a transmitter and a receiver. When a solid object, such as a carton, breaks (or unbreaks) this beam, the electronic state of the photo eye changes and activates or deactivates an electrical circuit as a result.

**Retro-Reflective** – the retro-reflective type of photo eye consists of a transmitter/receiver and a stationary reflector. When a solid object, such as a carton breaks (or unbreaks) this beam, the electronic state of the photo eye changes and activates or deactivates an electrical circuit as a result.

**Reflective** – the reflective type of photo eye consists only of a transmitter/receiver. When a solid object, such as a carton, breaks and reflects this beam the electronic state of the photo eye changes and activates or deactivates an electrical circuit as a result.
4. Software Setup

Computer Operation

Touchscreen
The computer software is accessed and controlled through a touchscreen, which replaces a physical keyboard and mouse. The user selects options by momentarily touching the desired “button” on the screen with a finger. Functions may range from simple option selection to a virtual keyboard. The terms “Touch” and “Select” may be used interchangeably in this manual to direct the user to select an on-screen option.

CAUTION: Do not use sharp objects to activate the screen. Objects sharper than a finger will cause damage.

Touch Keypad
The Touch Keypad (right) displays the name of the value to be edited, the current value, the minimum and maximum values that may be entered, and the units. The editing takes place in the current value window. Touch the green check mark to accept the new value and close the keypad. Touch the red X to cancel editing and close the keypad. The grey left arrow is backspace and the pencil eraser will clear the current value.
Touch Keyboard

The Touch Keyboard allows the editing of text values, such as a Recipe name, as shown. The text is shown in the edit window (black background) near the top of the screen keyboard as it is entered. The following keys provide helpful editing features:

- **Shift**: Shift key for single capitol letter
- **Caps Lock**: Lock entry into upper case mode
- **BKSP**: Move to the left and erase the character to the left of the cursor
- **DEL**: Delete the character at the cursor position
- **Del EOL**: Delete characters from the cursor position to the end of the line
- **End**: Move cursor to the end of the line
- **Home**: Move cursor to the beginning of the line
- **ESC**: Cancel any changes made to the current text
- **CLR**: Clear the data in the entry window
- **Return**: Accept entry and close the keyboard

**Cursor navigation keys**

- **Clear entry**: Clear entry
- **Insert mode**: Insert mode
- **Overstrike mode**: Switch between qwerty and abcdedf key layouts.
- **Cancel edits and close the keyboard**: Cancel edits and close the keyboard.
- **Accept edits and close the keyboard**: Accept edits and close the keyboard.
**Popup Messages**
Certain machine states or warnings will cause a popup message to appear onscreen. These messages inform the user of some action required before the machine can continue. The user must clear the message by touching the message before continuing.

**Help System**
The help function is designed to assist the operator in system operation. The Help icon is located at the top right corner of every screen. Touching the Help button allows the user to access information about every button in the software. The help feature is an abbreviated, onscreen version of Delta Systems' provided software manual. To use:

1. Touch the Help icon, which will change to green, to enter Help Mode. Normal program functions are suspended in Help Mode.
2. With Help Mode active, press any other button to display a help screen offering a brief description of the feature. Clear the help display by touching the screen again.
3. Touch the Help button again to return to Normal Mode. The icon will change to its normal color, and normal functionality returns to the screen.
Control Screens

Main Display

The Main Display is the primary software screen, and allows access to all software operating and programming functions, and machine setup.

Each segment of the Main Display allows user control of different machine functions, or access to advanced controls. The following sections describe these functions.

Machine Operational Information

<table>
<thead>
<tr>
<th>State</th>
<th>Homing is Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packages</td>
<td>0 Packages</td>
</tr>
<tr>
<td>Run Count</td>
<td>0 Packages</td>
</tr>
<tr>
<td>Efficiency</td>
<td>26.01 Percent</td>
</tr>
</tbody>
</table>
- **State** – Indicates the current machine state.
- **Reset** - Touch this button to Reset the Run Count to zero.
- **Run Count** – Indicates the total packages completed since the Reset button was last pressed.
- **Efficiency** – Percentage based on packages complete vs. machine speed.

**System Information**

- **Log In** - Touch this button to Log in or Out of the system security. This button is GREEN if there is a user already logged in.
- **Level** – Indicates the security level of the person logged in.
- **Shift** – Indicates the current plant shift.
- **Datecoder Ready** – Indicates the datecoder unit is ready (if installed).
- **Datecoder Warning** – Indicates a datecoder alarm (if installed).
- **Inputs Forced** – Indicates if any inputs are forced on the Configuration & diagnostics Digital Inputs/Outputs screen.
- **Outputs Forced** – Indicates if any outputs are forced on the Configuration & diagnostics Digital Inputs/Outputs screen.

**Machine Speed**
- **CPM** – Cartons per minute; the larger number indicates current machine speed (in yellow), and the smaller number indicates programmed speed (in white).

- **Up Arrow** – Touch here to increase the speed of the cartoner by the increment set in recipe value R7 (Speed Increment).

- **Down Arrow** – Touch here to decrease the speed of the cartoner by the increment set in recipe value R7 (Speed Increment).

**Machine Options**

- **Apply Glue** – Use this button to enable/disable the application of hot glue while the machine is being cycled. Changing this parameter will modify the R41 Recipe value (Glue System: Enable Glue Application) and will be saved along with the other recipe values.

- **Feed Cartons** – Use this button to enable/disable the feeding of Cartons while the machine is being cycled. Changing this parameter will modify the R80 Recipe value (Carton Feeder: Enable Carton Pulldown) and will be saved along with the other recipe values.

- **Print Datecode** – Use this button to enable/disable the printing of the Datecode information onto the final carton. If Enabled, the Datecode information will be printed, if Disabled, the Datecode information is not printed.

- **Carton Feed Shutdown** – Use this button to enable/disable the shutting down of the machine if a specified number of consecutive misfed cartons has been detected at the Carton Pusher's loading area. The number of consecutive misfed carton required to cause a shutdown is specified by a value R78 in the current recipe.

- **Raise Carton Hold Down Rails** – Touch here to Raise/Lower the Carton Hold Down Rail. The Cartoner must be stopped to use this button. When the Cartoner is started, the hold down rail will return to the down position.
**System Options**

<table>
<thead>
<tr>
<th>Recipe Editor: Fruit Filled Fins</th>
<th>Machine Maintenance</th>
<th>Configuration &amp; Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Recipe</td>
<td>Summary Report</td>
<td>Speed Report</td>
</tr>
<tr>
<td>Español</td>
<td>Downstream Equipment Bypass</td>
<td>Alarm Log</td>
</tr>
<tr>
<td></td>
<td>Acknowledge Alarm</td>
<td></td>
</tr>
</tbody>
</table>

- **Recipe Editor** – Touch this button to access the system's Recipe Editing screen. Changes made to the recipe become effective immediately.

- **Select Recipe** – Touch this button to select a new recipe to be used for machine operation. A screen is displayed, listing all available recipes. Selecting any of the labeled recipe buttons will load all of the machine configuration parameters for the named recipe to be used for subsequent machine operations. Recipe selection is only available whenever the machine is NOT in a running condition.

- **Español** – Touch this button to switch languages between English and Spanish.

- **Machine Maintenance** – Touch here to access the Machine Maintenance screen. This screen allows access to the timing adjustments used for optimally tuning the cartoner’s operation. Also, there are several functions for testing and setup of the cartoner and the screen for setting the Servo reference positions are available from this screen.

- **Summary Report** – Touch here to access the Summary Report screen, which displays information about the machine’s operation, shutdown occurrences, and production. The information on this screen may be displayed for the current shift, the previous 24 hours’ shifts, or as a composite of the previous 24 hours’ shifts.

- **Speed Report** – Touch here to access the Speed Report screen. The machine's speed, averaged each minute, may be displayed on this screen, along with the machine's average speed, average running speed, total down time, and total time spent waiting for incoming product. Buttons are provided for selecting the starting and ending times for displaying the speed graph values.

- **Downstream Equipment Bypass** – Touch here to Enable/Disable the Downstream Bypass. If the downstream equipment is not running, this button may be pressed to allow the system to run. The button will be RED if the Bypass is turned On.

- **Configuration & Diagnostics** – Touch this button to access various screens and functions for machine configuration and diagnostics.

- **Alarm Log** – Touch this button to view the twenty most recent system shutdown and alarm messages. Any messages which have not been previously viewed are displayed in YELLOW, while those previously viewed are shown in LIGHT GRAY. Messages are stamped with the time and date of occurrence, and the most recent message is always shown at the top of the message list.

- **Acknowledge Alarm** – Touch this button to silence the audible alarm. The alarm may also be silenced using the start and stop buttons on the Operator Interface.
Advanced users and maintainers will use this screen to adjust phase offsets and complete maintenance testing.

- **Machine State** – Indicates the current machine status.

- **Phasing Chains Offset** – This offset is used to adjust the distance from the front of the Datum Chains to the back of the Phasing Chains. This value is set to the width of the carton during the setup for the carton. Touch the arrow buttons to make incremental adjustments or touch the value area between the arrows to enter a new value with a pop up keypad. A larger value will produce more space for the carton.

- **Carton Feeder Offset** – The Carton Feeder Offset value is used to adjust the timing of the placement of a carton into the space between the Datum Chains and the Phasing Chains. Touch the arrow buttons to make incremental adjustments or touch the value area between the arrows to enter a new value with a pop up keypad. A larger value will place the carton sooner. If the value is at the maximum, continuing to increment the value will wrap it around through zero and will continue to place the carton sooner.

- **Left Flap Tucker Offset** – The Left Flap Tucker Offset is used to adjust the timing of the minor trailing flap tucking on the left side of the cartoner. Touch the arrow buttons to make incremental adjustments or touch the value area between the arrows to enter a new value with a pop up keypad. A larger value will tuck the flap sooner. If the value is at the maximum, continuing to increment the value will wrap it around through zero and will continue to tuck the flap sooner.
• **Right Flap Tucker Offset** – The Right Flap Tucker Offset is used to adjust the timing of the minor trailing flap tucking on the right side of the cartoner. Touch the arrow buttons to make incremental adjustments or touch the value area between the arrows to enter a new value with a pop-up keypad. A larger value will tuck the flap sooner. If the value is at the maximum, continuing to increment the value will wrap it around through zero and will continue to tuck the flap sooner.

• **Simulate Product in Buckets** – Touch this button to simulate having product in every bucket. This will cause a carton to be placed in the chain conveyor every cycle.

• **Simulate Cartons Loaded** – Touch this button to simulate having a carton in every flight of the chain conveyor, which will allow the barrel loader bypass to direct the arms to the loading cam (product with no carton is the condition that will bypass the loading cam).

• **Glue Nozzles Left and Right** – Touch the desired button to test fire the glue nozzle. The nozzle output will turn on when the button is touched, and will remain on until the button is released.

   ! CAUTION – Hot glue may be released! Know where the nozzle is pointed when using this button!

• **Set Home Reference Positions** – Touch this button to go to the Set Home Reference Positions screen. This screen has buttons for setting the absolute encoder position to zero for each of the Cartoner servos.
Set Home References

Touch any of the buttons to set the reference position for the Servo Axis whose name is displayed on the face of the button.

This action establishes the current position of an axis as its Home (Zero) position. Referencing an axis may be necessary if mechanical changes have been made to one or more of the servo axes, or if the starting positions of the axes have been changed in relation to one another.

When the button is pressed, the text next to the button will change to 'Referencing' and then to 'Referenced'. This action can only be performed while the machine is in an Emergency Stop condition, and the operator is notified with an alarm message if this is not the case.
Configuration & Diagnostics

**Configuration**

- **Set Date** – Touch this button to set the system date. A keypad will be displayed to enter the new system date information.

- **Set Time** – Touch this button to set the system time. A special keypad will be displayed to enter the new system time information.

- **Shift Configuration** – Touch this button to access the Shift Configuration setup screen. This screen is used to configure the Shift Names and Starting Times of the production shifts.

- **Network Configuration** – Touch this button to access the network settings screen. This screen is used to set the IP address of the machine in order to connect via the network.

- **PID Loop Configuration** – Touch this button to access the PID configuration screen and set the following parameters:
  - Proportional Gain
  - Integral Time
  - Derivative Time
  - Feed Forward Gain
- Measurement Scaling
- Setpoint Scaling
- Feed Forward Scaling
- Output Scaling
- Measurement High and Low Limits
- Setpoint High and Low Limits
- Feed Forward High and Low Limits
- Output High and Low Limits
- Current Setpoint
- Operating Mode
- Loop Name

- **PLS Timing Chart** – Touch this button to access the PLS timing chart. The ladder logic is scanned for cyclic PLS (Programmable Limit Switch) blocks and the settings are displayed on a timing graph to provide a visual indication of the PLS on and off angles.

- **PLC Programming** – Touch this button to go to the PLC programming screen. From this screen the user can monitor or modify the system PLC logic. Improper logic changes may adversely affect or even prevent the proper operation of the machine, so changes should only be made by trained personnel.

- **Machine Configuration** – Touch this button to access the Machine Configuration Utility. This utility is used to configure the I/O hardware and servo amplifiers and to establish the function performed by each axis. Incorrect entries can cause the system to stop working. Only trained personnel should make use of these functions.

- **Edit ‘K’ Registers** – Touch this button to access the Edit K Registers screen. The names and values of the registers can be changed from this screen. K registers are usually used as constants and their values will not change when the machine is restarted.

**Diagnostics**

- **Digital Inputs and Outputs** – Touch this button to access the Digital Input and Output screen. This screen allows the user to view and force the digital I/O states.

- **Analog Inputs and Outputs** – Touch this button to access the Analog Input/Output display screen. This screen allows the user to monitor the current voltage levels of the installed Analog Input/Output values.

- **Input Analyzer** – Touch this button to view the Input Analyzer. This is a helpful tool to diagnose possible faults on the input sensors.

- **Oscilloscope** – Touch this button to access the built-in Oscilloscope. This feature allows on-line monitoring of the servo axes, PLC state information, etc.

- **PLC Monitoring** – Touch this button to monitor the real time PLC program. This screen only allows users to view the PLC and not make any changes to the program. This may help the user in diagnosing any electrical problems.

- **Sercans Diagnostics** – Touch here to access the SERCOS Diagnostic utility. The commanded and actual velocity and position is displayed along with status and error values for each axis.
• **Secros IDN Explorer** – Touch this button to access the Sercos IDN Explorer. This screen will allow you to view/edit IDN values and to perform advanced diagnostics of your SERCOS communications ring.

  **System Security**
  • **Edit Button Security** – Touch this button to edit the security level on any button. When the edit security function is activated, this button will turn Green. The user can go to any screen and press the edit security button, which replaces the help button, and assign levels for any button on that screen. The current security level for a button will be shown in yellow. To exit the edit security function, the user can touch this button to change it back to its original color.
  • **Security Level Names** – Touch this button to edit the Security Level Names. The Names of each Level can be modified by selecting which level name you want to change.
  • **View/Edit Users** – Touch this button to view/edit the list of users on this machine.

  **Servo Adjustments**
  • **Axis Phasing** – Touch this button to access the axis phase adjustment screen. The phase adjustments are used to set the relative positions of the servo axes. Controls are provided to adjust the follower phase and the cam phase for each axis. The phase values are stored with the current recipe to allow independent settings for each product.

    **O NOTE:** The Operator Adjustment Screen provides the Phase Value Adjustment for necessary Axes.

  • **Manual Motor Control** – Touch this button to access the Manual Motor Control screen. To enter this screen, the machine must not be running. This screen displays all of the servo motors that can be run in Manual Mode. To start a motor simply press which motor to run then press the Start button. The motor will run until the Stop button is pressed.

    **O NOTE:** Upon exiting this screen and setting all the motors back to normal mode (all buttons grey color), rehoming may be required.

  **Data/Archives**
  • **Backup/Restore** – Touch this button to access the Backup/Restore screen. This screen allows the user to backup files for safe keeping to a selected backup point, the hard drive or a floppy disk if available. The backup files can also be restored from this screen if the user wants to return the machine to a previous saved state.
  • **Operator Change Log** – Touch this button to access the Operator Change Log. This log maintains a record of all significant changes made to the machine configuration parameters or to any recipes in the last 24 hours.
**Manual Motor Control**

Manual Mode allows one or more axes to be operated for maintenance purposes.

Touch any drive button to toggle between Automatic and Manual modes. In Manual mode, the drive button will be green, and the drive will run in the direction of product flow at the speed designated in recipe values R1 and R2. All selected axes (green button) will participate in the manual operation.

**O NOTE:** Remove any product and packaging from the bucket conveyor and lugs before activating Manual mode.

---

**Activate Manual mode**

- Press one or more drive buttons on the Manual Motor Control screen.

- Press the HMI Start button to operate the drive at the Machine Speed (recipe value R1). There will be a 3-second delay with a warning horn before motion begins. Press the Stop button to stop the drive.

- Press and hold the HMI Jog button to operate the drive at Jog Speed (recipe value R2). Release the jog button to stop the drive. The first jog operation will have a 3-second delay with the warning horn before motion begins. Subsequent operations while still in Manual mode will have no delay.

- With either of these operations in progress, touching any drive button will immediately place that axis in operation, or remove that axis from operation.

- All axes move until they are stopped.
CAUTION: Remove the tuck arm before running a flap tucker motor.

Return to Automatic Mode
All drives must be in Automatic mode for the cartoner to return to normal operation. When finished with Manual mode, touch the appropriate drive button to return it to Automatic mode.

Running a servo in Manual Motor Mode will require the machine to be re-homed when finished. The Machine State will change to 'Homing Is Required' after leaving Manual Motor Mode if it is required. Press the Start button to home the machine.

Set Zero Reference Positions
Each servo motor has a Zero reference or “home” position. The servo motor’s zero position establishes a reference point from to calculate position and speed information about that motor. The zero position for each servo motor corresponds to a physical alignment of the component that the servo motor drives.

There are eight axes on the Cayenne that must be set to zero reference before operations. These axes have been set at the factory, and will not need adjustment unless a maintenance function has changed an axis setup. This section will describe how to set each axis to zero reference. These procedures should be completed only by authorized, trained maintenance personnel with the machine in a cycle stop status.

Left and Right Datum Lugs
1. Use Manual Motor Control (Main Display > Configuration & Diagnostics > Manual Motor Control) to move the left and right datum chains so the leading edge of any lug is aligned with the datum scribe mark (below).

2. Use a square to ensure the left and right lug chains are aligned at the scribe mark (below).
3. Open the Set Home Reference screen (Main Display > Machine Maintenance > Set Home Reference Positions) and touch the Left Datum Chain and Right Datum Chain button to set the new home position for each chain.

4. Touch the Go Back icon to the Machine Maintenance screen and enter the desired offset value for each datum lug.

**Left and Right Phase Lugs**

1. In the Machine Maintenance screen set the Phasing Chains Offset to zero.

2. Use Manual Motor Control to move the left and right phasing chains so the trailing edge of the phasing lug is very close to the leading edge of the datum lugs.

3. Insert an unopened carton between the datum lugs and phasing lugs.

4. Use Manual Motor Control to adjust the phasing lugs to the position shown below – the leading edge of the datum lugs should be aligned with the trailing edge of the phase lugs, and the carton should be flat between them with no bends.
5. Open the Set Home References screen and touch the Left and Right Phasing Chain buttons to set the new home position for each chain.

6. Touch the Go Back icon to the Machine Maintenance screen and enter the desired offset value for each phase lug.

**Bucket Conveyor**

1. With the datum chains at the zero reference position, use Manual Motor Control to position any bucket so the trailing edge of the bucket is aligned with the front edge of the datum lugs as shown below.

2. Open the Set Home References screen and touch the Bucket Chains button to set the new home position.

**Front and Rear Flap Tuckers**

1. Rotate the left and right flap tuckers until the tip is touching the rail as shown below.

2. Open the Set Home References screen and touch the Left and Right Flap Tucker buttons to set the reference position.

3. Touch the Go Back icon to the Machine Maintenance screen and enter the desired offset value for each flap tucker.
Carton Picker Assembly

1. Push any E-Stop button to disengage the servo motor from the carton picker assembly.
2. Place a level across any 2 of the 3 planetary shafts as shown below.
3. Rotate the assembly until level. Note the vacuum cup arms on the 3rd bottom shaft should be vertical.
4. Open the Set Home References screen and touch the Rotary Carton Feeder button to set the new home position.
Product Recipes

Select, Create or Delete a Recipe

- To select a different recipe, touch Select Recipe on the Main Display and choose any listed recipe.

- To create a new recipe, touch any unused recipe button, and answer the “Create New Recipe” prompt by touching . A new recipe will be created which is a duplicate of the previous recipe, with a generic name related to the recipe button to which it is assigned.

- To rename this recipe, select the new recipe as described above.

- Touch the Edit Recipe button on the Main Display, then the Recipe Name button at the bottom of the recipe page.

- Enter the new recipe name using the keyboard and press to accept.

- To delete, select the unwanted recipe then touch the eraser icon. Select X to cancel or to erase.

- Up to 40 recipes may be created and saved. If there are more than 20 recipes, use the arrow buttons at the bottom of the page to scroll up or down one page at a time.

Edit Recipe

The recipe pages allow setup of many machine and product values. The following buttons are at the bottom of each Recipe page:

- Memo – The Memo icon opens a Product Notes window. Press the Pencil icon to enter up to 5 lines of notes.
- **Ô or ð** - Use the arrow buttons to go to the next or previous recipe page.
- **Recipe Name** – Opens a keyboard to enter a new name for the current recipe.

To change Recipe values, touch the desired button to either toggle between options such as Enable or Disable, or to open a keypad to enter a new value. Each keypad will display the minimum and maximum limits for that option, and the value units (i.e. PPM, Percent, Inches, etc).

<table>
<thead>
<tr>
<th>Inspection Belt Speed</th>
<th>Velocidad de Inspección</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong> 9.50</td>
<td>IPP</td>
</tr>
<tr>
<td><strong>Minimum</strong> 4.00</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum</strong> 20.00</td>
<td></td>
</tr>
</tbody>
</table>

Use the Ô button to backspace after entering a value, or touch the Eraser icon to delete the entry. When complete, touch X to cancel, or ÿ to accept the change. Recipe options are described in the next section.

**Recipe Options**

The recipe options pages allow the programmer to fine tune the operation of the machine by specifying individual values for the multiple functions being completed by the cartoner. Press the “?” button to activate the help system, then touch any recipe button to see the help information for that recipe option. Press the “?” button again to disable the help system and return to operating mode.
## Recipe Page 1 Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 Machine Speed</td>
<td>120 CPM</td>
</tr>
<tr>
<td>R2 Jog Speed</td>
<td>60 CPM</td>
</tr>
<tr>
<td>R3 Minimum Speed</td>
<td>25 CPM</td>
</tr>
<tr>
<td>R4 Maximum Speed</td>
<td>300 CPM</td>
</tr>
<tr>
<td>R5 Acceleration Rate</td>
<td>120 CPM/s</td>
</tr>
<tr>
<td>R6 Deceleration Rate</td>
<td>120 CPM/s</td>
</tr>
<tr>
<td>R7 Speed Increment</td>
<td>5 CPM</td>
</tr>
<tr>
<td>R8 Cartrier Drop Position</td>
<td>0.00000 Degrees</td>
</tr>
</tbody>
</table>

### R1 Machine Speed –
This is the speed the cartoner will run at when the start button is pressed in cartons per minute (CPM). This value can also be adjusted on the Main Display by touching the displayed speed, or by using the up and down arrows on either side of the speed display.

### R2 Jog Speed –
This is the speed the cartoner will run at when the jog button is pressed in cartons per minute (CPM).

### R3 Minimum Speed –
This is the minimum value that may be entered in the Machine Speed (R1) and Jog Speed (R2) settings.

### R4 Maximum Speed –
This is the maximum value that may be entered in the Machine Speed (R1) and Jog Speed (R2) settings.

### R5 Acceleration Rate –
This value controls the rate at which the cartoner increases speed when the cartoner is started, or when the speed is changed, in cartons per minute, per second (CPM/s).

### R6 Deceleration Rate –
This value controls the rate at which the cartoner decreases speed when the cartoner is stopped, or when the speed is changed, in cartons per minute, per second (CPM/s).
• **R7 Speed Increment** – This is the amount of increase or decrease in speed applied when an arrow button on either side of the speed display (Main Display upper right) is pressed.

• **R8 Cartoner Stop Position** – This button controls the position the cartons are in when the cartoner is stopped with the stop button or when the downstream equipment is not ready. Use this value to make sure the cartons are positioned at the Major Flap Closers correctly to allow the closers to hold the carton closed and allow the glue to set.

• **R11 Datecoding System: Print Datecode** – Used to enable/disable Datecode printing onto the carton. Setting the value to ‘Enabled’ allows the Datecode to print by providing a firing pulse to the Datecoder at the location specified by the 'Firing Trigger On Angle' parameter value. Setting this value to ‘Disabled’ will inhibit the firing trigger, disabling the Datecoder printer from printing.

• **R12 Datecode System: Glue Eye to Printing Distance** – Use this button to specify the distance from the Carton at Glue Position photo eye (Glue Eye) to the Datecoder’s printer head, in inches. The value is used to determine when the carton is in front of the Datecoder printer, so that the Datecode can be properly applied to the carton.

• **R13 Carton Conveyor Fill Eye Off Automatic Move Cycle Count** – The Magazine Belt is used to keep the carton magazine full. This value controls how often the magazine belt will index when the magazine fill eye is off. When the number of cards placed into the chain conveyor has reached the value entered here, the magazine belt will index for the time set in Magazine Belt Index Time at the speed set in Magazine Belt Speed (R15 and R16).

• **R14 Carton Conveyor Fill Eye On Automatic Move Cycle Count** – The Magazine Belt is used to keep the carton magazine full. This value controls how often the magazine belt will index when the magazine fill eye is on. When the number of cards placed into the chain conveyor has reached the value entered here, the magazine belt will index for the time set in Magazine Belt Index Time at the speed set in Magazine Belt Speed (R15 and R16).

• **R15 Carton Conveyor Index Time** – The Magazine Belt is used to keep the carton magazine full. This value controls the duration of the magazine belt index move made when number of cartons placed in the chain conveyor reaches the amount set in recipe value R13 or R14 (if the eye is on or off).

• **R16 Carton Feeder: Misfed Cartons Shutdown Count** – The Magazine Belt is used to keep the carton magazine full. This value controls the speed of the magazine belt index move made when number of cartons placed in the chain conveyor reaches the amount set in recipe value R13 or R14 (if the eye is on or off).

• **R17 Carton Feeder: Shutdown for Misfed Cartons** – Use this button to specify how many consecutive misfed carton are required before the Cartoner is shut down.

• **R18 Carton Feeder: Enable Carton Pulldown** – Used to enable/disable Cartoner shutdown for misfed cartons (see help for recipe value R17).

• **R19 Carton Magazine Belt Speed** – Used to enable/disable Carton pulldown. If this value is set to ‘Yes’, the carton feeder will place cartons into the chain conveyor flights when product is detected in the bucket that will load into that flight.

• **R20 Carton Feeder: Carton Pick Lock Angle** – When a carton needs to be placed into a chain conveyor flight, this value is used to set the chain conveyor angle where the carton feeder locks in to operation. This value is set at the factory and should be changed only at the request of a qualified service technician.
**Recipe Page 2 Options**

<table>
<thead>
<tr>
<th>Recipe</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R21</td>
<td><strong>Glue System: Enable Glue Application</strong> - Used to enable/disable the application of hot glue. While set to 'Disabled', the glue guns will not be fired. While set to 'Enabled' the glue guns will be fired while there is a carton detected at the glue gun location, and while the Carton Conveyor's position lies within one of the Glue Firing Gates (1 or 2) specified in this recipe.</td>
<td>No</td>
</tr>
<tr>
<td>R24</td>
<td><strong>Glue System: Stitch Glue on Nozzle</strong> - Used to enable/disable 'stitching' on the Left or Right Glue gun. If the value is set to 'Enabled', the glue gun repeatedly turns On and Off according to the 'Stitch On Time' and 'Stitch Off Time' parameters specified for this recipe. Glue is only applied when a carton is in the glue area, the Carton Conveyor's position falls within either the 'Gate 1 On Angle' and 'Gate 1 Off Angle' positions or the 'Gate 2 On Angle' and 'Gate 2 Off Angle' positions set in this recipe, and while Glue Application is enabled. If this value is set to 'Disabled', the glue gun will fire continuously while the other gluing conditions are present.</td>
<td>No</td>
</tr>
<tr>
<td>R25</td>
<td><strong>Glue System: Nozzle Stitch On Time</strong> - If stitching is enabled on the Left or Right Glue Gun, the gun will be turned On for this period of time (in milliseconds), and then turned Off for the period of time specified in the 'Stitch Off Time' value, as long as the other glue conditions are present.</td>
<td>20 milliseconds</td>
</tr>
<tr>
<td>R28</td>
<td><strong>Glue System: Left Nozzle Stitch On Time</strong></td>
<td>25 milliseconds</td>
</tr>
<tr>
<td>R29</td>
<td><strong>Glue System: Right Nozzle Stitch On Time</strong></td>
<td>25 milliseconds</td>
</tr>
<tr>
<td>R31</td>
<td><strong>Glue System: Left Nozzle Gate 1 On Angle</strong></td>
<td>150,000 degrees</td>
</tr>
<tr>
<td>R32</td>
<td><strong>Glue System: Left Nozzle Gate 1 Off Angle</strong></td>
<td>0,000 degrees</td>
</tr>
<tr>
<td>R34</td>
<td><strong>Glue System: Left Nozzle Gate 2 On Angle</strong></td>
<td>150,000 degrees</td>
</tr>
<tr>
<td>R35</td>
<td><strong>Glue System: Left Nozzle Gate 2 Off Angle</strong></td>
<td>0,000 degrees</td>
</tr>
<tr>
<td>R38</td>
<td><strong>Glue System: Right Nozzle Gate 1 On Angle</strong></td>
<td>150,000 degrees</td>
</tr>
<tr>
<td>R39</td>
<td><strong>Glue System: Right Nozzle Gate 1 Off Angle</strong></td>
<td>0,000 degrees</td>
</tr>
<tr>
<td>R42</td>
<td><strong>Glue System: Right Nozzle Gate 2 On Angle</strong></td>
<td>150,000 degrees</td>
</tr>
<tr>
<td>R43</td>
<td><strong>Glue System: Right Nozzle Gate 2 Off Angle</strong></td>
<td>0,000 degrees</td>
</tr>
</tbody>
</table>
• **R26, R30: Glue System: Left Nozzle Stitch Off Time** – If stitching is enabled on the Left or Right Glue Gun, the gun is turned On for the period of time set in the ‘Stitch On Time’ value, and will then turn Off for the time (in milliseconds) specified in this value, while all of the other glue conditions are present.

• **R31, R32, R33, R34 Left Glue System: Nozzle Gate On Angle** – There are two glue firing ‘gates’ for the Left Glue Gun. If Glue is enabled, the glue gun will be gated On (enabled to fire) whenever the Carton Conveyor's position is between the ‘Gate 1 On Angle’ and ‘Gate 1 Off Angle’ positions, or the ‘Gate 2 On Angle’ and ‘Gate 2 Off Angle’ positions. Set the ‘On Angle’ and ‘Off Angle’ parameters for either gate to the same value (0.0) to disable that firing gate.

• **R32, R34, R38, R40 Right Glue System: Nozzle Gate Off Angle** – There are two glue firing ‘gates’ for the Right Glue Gun. If Glue is enabled, the glue gun will be gated On (enabled to fire) whenever the Carton Conveyor's position is between the ‘Gate 1 On Angle’ and ‘Gate 1 Off Angle’ positions, or the ‘Gate 2 On Angle’ and ‘Gate 2 Off Angle’ positions. Set the ‘On Angle’ and ‘Off Angle’ parameters for either gate to the same value (0.0) to disable that firing gate.
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5. Machine Operation

Powering the Machine

Turn the Machine ON
Follow these steps to turn on the system after a complete shutdown.

1. Turn the Main Disconnect to ON.
2. Turn on the glue pot; allow 15 minutes to reach operating temperature. See OEM specifications for operating procedures.
3. Load the carton magazine with cartons.
4. Ensure product supply is ready.
5. Press Start to home the machine.
6. Enable downstream equipment.

Turn the Machine OFF
At end of shift:

1. Ensure all product is run out of system.
2. Press the HMI Stop button.
3. Press the HMI E-Stop button.
4. Turn off the glue pot.
5. For complete shutdown, turn the Main Disconnect to OFF.

Begin Operations

User Login
Some machine activities require the user to be logged in. To login to Softflow:

1. Touch the Login button on the Main Display.
2. Touch the User button on the login screen, then use the keypad to enter username.

3. Touch the Password button on the login screen, then use the keypad to enter password.

4. Press the Return button to complete the login.

Home the Machine

The machine must be homed before operating. On startup or after some maintenance activities the machine status will display “Homing is required.” Press the Start button to move all axes to their zero reference position and the machine is homed and ready for operation.

Enable Machine Features

Touch to enable or disable the desired features on the Main Display:

- **Apply Glue** – enable or disable the glue system during machine operation.
- **Feed Cartons** – enable or disable carton feed during machine operation.
- **Print Datecode** – enable or disable the Datecoder (if installed) during machine operation.
- **Carton Feed Shutdown** – enable or disable shutting down the machine when a specified number of consecutive misfed cartons has been detected at the barrel loader.
- **Raise Carton Hold Down Rails** – touch to raise or lower the carton hold down rail. The rail will automatically return to the down position when the cartoner is started.

Alarm Log

Touch this button to view the previous alarm messages. Alarm messages are stamped with the time and date of occurrence, with the most recent message at the top of the list. Each oncoming operator should review the log at the beginning of the shift.
Select Recipe
The Select Recipe screen contains up to 40 recipes for different products. Touch the desired recipe name to select. Whenever a new recipe is selected, the machine may need to be reconfigured and rehomed.

Start Cartoner
When all options are correctly set and/or enabled, begin operations:

- Start any product infeed units.
- Load product to buckets.
- Press the Start button – all axes will begin continuous motion except the carton picker, which will not move until product is detected.
- Observe operation and product output for proper packaging.
- Monitor output for any required phase adjustments.
- Refill carton magazine as required.

Product Changeover
The Cayenne cartoner can run multiple product sizes. Complete these steps to adjust the machine to run a different size product box. Refer to the Changeover Value Table for measurement values, and to the changeover diagram below for adjustment point locations.
Control Changes

1. Press any E-stop to safety the machine.
2. On the Main Display choose Select Recipe, and choose the desired recipe.
3. On the Main Display, choose Machine Maintenance, and enter the offset values for the new product per the Changeover Value Table.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phasing Chains Offset</td>
<td>6.65</td>
</tr>
<tr>
<td>(Spacing between Datum and Phase Chains)</td>
<td></td>
</tr>
<tr>
<td>Carton Feeder Offset</td>
<td>11.40</td>
</tr>
<tr>
<td>(Carton Position in Datum Chains)</td>
<td></td>
</tr>
<tr>
<td>Left Flap Tucker Offset</td>
<td>2.10</td>
</tr>
<tr>
<td>(Tucking Position relative to Datum Chains)</td>
<td></td>
</tr>
<tr>
<td>Right Flap Tucker Offset</td>
<td>5.50</td>
</tr>
<tr>
<td>(Tucking Position relative to Datum Chains)</td>
<td></td>
</tr>
</tbody>
</table>

Barrel Loader Face

If a new size pusher is required, remove the two bolts, exchange the pusher, and replace the bolts.

Bucket Conveyor

1. If the new product requires a change in the size of the bucket:
2. Remove the cover from the end of the bucket conveyor (below left).
3. Loosen the nut on each side of the bucket adjustable plate (above right).
4. Reposition the plate to the desired size per the Changeover Value Table.
5. Tighten the nut on each side of the adjustable plate.
6. Repeat for all buckets.
7. Reinstall the cover.

**Carton Magazine**

1. Remove all cartons from the magazine.
2. Rotate adjustment wheel (2) counterclockwise (CCW) to move the carton magazine out (below left).

3. Disconnect the low carton supply photo eyes from the front plate (above right).
4. Pull the locking pin at the bottom of the magazine plate, and pull the magazine plate out of its bracket. Store it in an appropriate location.
5. Install the new magazine front plate, install the locking pin, and re-connect the photo eyes.

6. If there is a size change to complete on the magazine plate re set all of the rails and carton hold back tabs to the new settings (A through J).

7. Reposition the carton magazine back plate to (3) to the setting for the new size carton.
   a. Loosen the clamps on both sides of the handles (below right).
   b. Use handles to reposition back plate to new position.
   c. Tighten both clamps.
Rotary Carton Feed Assembly Height

1. Reposition the vacuum cup depth settings to new positions per the Changeover Value Table. Each arm is numbered (4, 5 & 6) and each cup will be A, B, or C with A being the closest to the arm mount.

2. Use the ratchet handle (9) to adjust the carton picker assembly to the new height per the Changeover Value Table.
Carton Magazine Height

1. Adjust the height of the carton magazine (1) to its new position per the Changeover Values Table.

2. Reposition the carton magazine (2) laterally to its new position.
Lug Chain, Top Rail and Plows

1. Adjust the width of the lug chain (10) to the new setting in the Changeover Value Table.

2. Adjust the height of the Top Hold Down Rails (12-13) to its new position.

3. Adjust the lateral position of the Top Hold Down Rail (14).
4. Adjust the position of the Rear Top Hold Down Rail (15 and 16).

5. Adjust the height of the Top Flap Guides (17, 18).

6. Adjust the height of the flap folders (8, 9, 11, 19 & 20).
Test New Setup

1. Pull out E-stop and push reset button.
2. Confirm all setup changes by manually placing a carton in each section to ensure proper fit and mechanical clearance.
3. Use the jog function to run several cartons from the pick assembly through the discharge end.
4. Make minor adjustments as needed.
5. Resume operation.
6. Maintenance

Unless power is specifically required for a troubleshooting operation, ensure Lock Out Tag Out (LOTO) procedures are followed in compliance with company and OSHA requirements before any maintenance or cleaning is completed on the cartoner.

⚠️ **CAUTION:** Do not use power wash on any electrical component or cabinet.

**Periodic Maintenance**

The use of servo motors, sealed bearings, and sealed drive systems significantly reduces required maintenance for the cartoner and associated conveyors. As with any machinery, though, some preventive maintenance is required to keep the system in good working order.

These tasks must be performed at the suggested intervals to help ensure trouble-free operation. Failure to perform this maintenance may increase down time, and may cause damage to the machine.

**Maintenance Schedule**

Periodic maintenance should be performed at the recommended time intervals, which include

- Daily
- Weekly
- Monthly
- Six months

Note any problems which occur during the shift, and report them to your supervisor. Do not attempt to make any adjustments to the system unless you have been trained to do so.

**Daily**

E-Stop the machine before conducting these steps:

- Inspect the vacuum cups for wear or damage.
- Clean vacuum pumps.
- Clear vacuum lines.
- Check the main air pressure.
• Check the filter system.
• Check for and remove any foreign materials or parts in or on the machine.
• Check the machine for loose parts; tighten as required.
• Clean the transparent covers with an anti-static plastic cleaner.
• Inspect the bearing housings and replace hot bearings.
• Inspect the photo eyes and clean the lenses as required. Use a soft cloth when cleaning the lenses.
• Clean product residue from buckets, barrel loader, and lug chains.
• Check Alarm Log for repeated failure and/or operator adjustments. **NOTE:** This screen may provide helpful troubleshooting information if problems occur.

**Weekly**

• Inspect the air regulator and check for correct pressure.
• Check the vacuum system for the proper pressure and either back-flush the system or clean the venturi, whichever is applicable.
• Check all chains and belts for proper tension.
• Tighten idlers as required.
• Lubricate with proper lubricants.
• Clean cylinder rods.
• Check all fasteners and linkages.
• Check for air leaks.
• Lubricate the rod eyes and universal joints.
• Use pressurized air to blow off all the machine surfaces to remove carton and product dust and debris.

**CAUTION:** Wear proper eye protection while using pressurized air blow!

• Use a warm soapy solution and sponge to hand wash any soiled areas of the machine, such as guard doors, conveyor belts, and guides. Remove any soap with clean water and sponge.

**Monthly**

• Inspect motors for proper operation. Adjust as required. Check motor mounts for tightness.
• Clean the machine thoroughly. Vacuum dust and dirt from machine.
• Inspect the machine.
• Check the chains and sprockets for wear.
• Check for loose components.
• Lubricate the machine.
• Remove all vacuum generators and replace with cleaned units.
• Inspect the barrel loader linear slides and bearings for wear or needed lubrication.
• Inspect the chains for any needed lubrication.
• Inspect the rod eyes and universal joints for wear damage and proper fit.
• Clean excess product residue from lugs and inspect for free movement.

**Six Months**
• Inspect lug chain for wear and correct tension. Replace if unable to achieve proper tension.
• Check bucket conveyor chain for proper adjustment and wear.
• Check bearings for freedom of movement.
• Grease the appropriate bearings on the changeover adjustment components.
• Check all fasteners for security.
• Clean product residue from the machine.
• Ensure safety guards are in place.

---

**Sanitation**

These are recommendations for minimum cleaning requirements. Follow your company standard operating procedure and schedule for complete sanitation procedures.

**Clean Infeed and Lug**

1. LOTO the machine.
2. Use a clean, soft damp cloth for cleaning.
3. Rotate the lug chain by hand to clean one section at a time. Chains may be removed if required for more thorough cleaning.
4. Clean the cartoner unit with compressed air blow, and wipe down.
5. Clean the takeaway belt with soft, damp cloth. Rotate the belt by hand to reach the entire surface.

---

**O NOTE:** Use a damp cloth to clean, not dripping. Do not leave standing water anywhere on the machine. Use caution not to contact the photo eyes while cleaning, which may knock them out of adjustment.

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**Touchscreen**

Clean the touchscreen with a clean, damp cloth only. Do not use or allow any abrasive sprays, liquids, or solvents. Do not apply excessive pressure to the screen.

If the machine is on, touch a corner of the touchscreen to freeze the screen while cleaning to prevent any program changes.
Lock Out Tag Out

Lock Out Tag Out (LOTO) must be used any time machine maintenance is to be performed, a cover must be opened or a door must be removed. The person working on the machine is responsible to apply the locks and safe the machine. If multiple people are working on the machine, each should apply a lock to ensure safety.

Apply LOTO at the Main Disconnect according to company maintenance policy.

Replace Computer

⚠️ WARNING: This procedure requires two people to safely complete!

1. Lock Out Tag Out (LOTO) the machine power.
2. Remove the rear panel of the computer cabinet.
3. Disconnect the computer power connector.
4. Disconnect the Ethernet and bar code reader connectors.
5. While a second individual holds the computer from the front side, use a Phillips screw driver to loosen and remove the long mounting screws, and clips, two per side, and two on the top and bottom of the case.
6. Pull the computer out from the cabinet and remove.
7. To install the new computer, fit the computer into the cabinet, then snug the computer into the frame.

8. Install two screws and clips on each side until finger tight, then tighten no more than one turn further with a Phillips screw driver. Repeat with the screws on the top and screws on the bottom of the case.

9. Connect the network and bar code reader cables to their original positions.

10. Insert the power connector and replace the HMI back cover.

11. Remove the LOTO restriction.

Vacuum System Maintenance

Use clean, dry air. Ensure that any replacement parts have an inside diameter equal to or larger than the original component.

- Remove any kinks or sharp bends found in the air lines.
- Lubrication is not required; no moving parts exist. Any lubricant in the venturi will trap dust particles and lead to vacuum problems.
- Adequate air flow must be maintained. Periodically cleaning all parts is necessary. Carton and product dust will begin to collect over a period of hours and days. While the vacuum is on, alcohol and a non-residue producing solvent may squirt through the vacuum cups.
- Air pressure and flow produce a sufficient vacuum. Even though adequate air pressure registers on the gauge, an inadequate air flow can cause an insufficient vacuum.
- With a vacuum gauge, check that the vacuum at each cup is approximately equal, and at a minimum pressure of 17 inches of Hg.

Servo Motor Replacement

A failed servo motor will prevent machine operation. To replace:

1. Identify the faulty motor.
2. LOTO power to the cartoner.
3. Remove tension to any belts or chains driven by the motor.
4. Remove the taper lock pulley (see Figure 5.6).
   - Remove the three attaching hex head bolts.
   - Insert screws into the two empty holes in the face of the pulley. Drive the screws in to push the pulley off the taper lock.
   - Remove the taper lock, pulley, and key from shaft.
5. Remove the four Torx head screws from the power connect cover, and unplug the power connector block.

Figure 5.6 Taper lock pulley
6. Remove the four motor mounting bolts. Support the motor and remove.
7. Reverse this sequence to install the new motor.
8. Remove LOTO, restore power to the cartoner, and test motor operation.

**Signal Light Replacement**

1. Grasp the signal light and rotate counterclockwise to line up the white lines on the socket and the lens.
2. Lift the light out of the socket.
3. Insert the replacement light into the socket.
4. Rotate the light CW until it stops, as shown at right.
7. Troubleshooting

Carton Damage
When cartons are torn, determine where the problem is originating. Check the cartons as they move through the machine until you pinpoint the problem area.

Rips in Cartons Leading Corners

When damage occurs in the carton opening area:

- Check the top rail. The rail should not rub the cartons and should have less than 0.8 mm (1/32") clearance between the opened box and rails.
- Check the vacuum setting for the carton feed; the vacuum should be at 20 inches of Hg.
Rips in Corners on Trailing Side of Carton

- Check the carton feed lug timing.
- Check the timing of the flap closer after loading.

Minor Flap Ripped

- Check the positioning of the flap closer after loading.
- Check for carton material jammed in the guides.
- Check tuck unit flap guides for position.

Wrinkles on Carton Side

- Check top rail to make sure is not set too low.
- Check transport lugs to make sure they are not too tight.
Crease on Top or Side of Carton

- The top rail is pressing down too tightly on top of the cartons.
- The leading transport lugs are set too close to the trailing lugs.

Bucket Conveyor Eye Fault

- Check photoeye cam timing.
- Check for loose wraps.
- Clean infeed eyes.
- Check if gain potentiometer on the infeed eye is set too high.

Carton Feed Problems

Cartons not Feeding

- Check that the main air supply is between 80 and 90 psi.
- Check that the carton feed vacuum is at least 17 inches of Hg.
- The carton magazine stops may be pressing too tightly on top of the cartons.
- Check the timing of the carton feed unit.
- Check the vacuum cups for cuts, nicks, or excessive wear.
- Check vacuum/air lines for splits.
- Check the positioning of the vacuum spindle to the carton scoreline at pick-off from the carton magazine and placement into the transport.
- Not enough cartons in the carton feed throat – adjust the carton supply photo eye to turn on the magazine feed motor when the throat has a low supply of cartons.
Carton Misfeed and L-Shaped Cartons

- Check the vacuum cups for cuts, nicks, or excessive wear.
- Check vacuum/air lines for splits.
- Check carton blanks for correct scorelines and condition of material.
- Check carton feed timing.
- Check to see that cartons are oriented properly in the magazine with Glue seam up and facing the carton feed.
- Check L-Shaped photo eyes for position and sensitivity.
- Check transport timing.
- Check for broken transport lugs.
- Check transport leading lug spacing and lug alignment.

Double-Feeding Cartons

- Make sure the cartons are stacked upright in the carton magazine.
- Check the carton magazine stops, they may be set too loosely.
- Check the carton minor flaps, they may be tangled in the carton magazine.
- Check the die-cut of incoming cartons.
- Check for the correct timing.
- Too many cartons in the carton feed throat.
  - The photo eye may be adjusted to turn on the magazine feed motor before enough cartons have been removed from the throat
  - This procedure will cause excessive pressure on the first few cartons in the throat, pushing another carton from the throat when one is removed.
- Check to see if cartons are glued together.

Cartons Not Opening

- Check the carton magazine height setting is correct and matches the calibration chart.
- Inspect incoming cartons, they may be glued shut. Report glued shut cartons to a supervisor.
- Check for incomplete or incorrect scorelines.

Carton Loading Problems

Product Fails to Load at Barrel Loader

- Check the timing of the loader.
- Check the transport lug timing.
• Check the top rail, it may be too low.
• The cartons may not be positioned correctly in the transport lugs.
• Check for proper product orientation.
• Check position of the loading guide – make sure the correct change part is installed.
• Check the load pushers.

Product Jams at Loader
• Make sure the correct pusher assembly is being used for the load and carton being run.
• Make sure the correct loading guide change part is installed.
• The loading guide and bucket should align for smooth loading into the carton.

Glue System Problems

No Glue
• To check for clogs, fire each gun manually.
• Check the air; if it is off at the glue unit (to the guns), turn the air ON.
• Check the carton detector photo eye operation; if the photo eyes are defective, replace them.
• Check the glue gun solenoids; if the solenoids are defective, replace them.
• Check if the glue timing is set incorrectly.
• Check for electrical power.
• Check to see if the filters in the tank or hose are clogged.
• Check for glue buildup on guide work.

One Glue-Gun Not Firing
• Check the nozzle; if foreign material is found, clean or replace the nozzle.
  o Foreign material in the glue system can cause excessive glue nozzle blockage; keep the glue supply covered.
  o When the machine is not in use, the glue may possibly burn in the hoses or tank. This occurrence can cause bits of burnt glue to clog the nozzles. Make sure glue tank is in setback mode.
• Check the temperature of the gun and hose – if the gun or hose is cold, check the fuses and/or check the heaters for an open circuit; replace the defective components.
• Check for a defective mac-valve solenoid.
• Check the final filter in the glue hose connection to the glue gun block for clogging and replace the filter if needed.
Wrong Glue-Bead Position
  - Check for out of position glue guns. Make sure the guns are mounted at the correct height and correctly pivoted.
  - At the set glue timing screen, check the glue gun settings.

Distorted Glue-Patterns
  - Check the glue gun air pressure; it should be 45 psi.
  - Check the glue system temperatures. As needed, adjust these temperatures.
    - Tank  330.8 °F (166° C)
    - Hoses  341.6 °F (172° C)
    - Guns  341.6 °F (177° C)

Glue Pattern “Fish Hooks”
  - Make sure no glue deposits are interfering with the glue jet.
  - Check the glue gun nozzle to make sure it is the correct part number.
Glue Pattern Wavy

- Waviness indicates that the glue is too cold. Before troubleshooting, make sure the glue system is up to operating temperature.
- Check the tank and hose thermostats.

Glue Pattern Stringy

- A stringy trailer on the glue bead indicates that the glue is too cold. Before troubleshooting, make sure the glue system is up to operating temperature.
- To check the nozzle temperature setting, use a temperature probe to verify the nozzle temperature.
Carton Discharge

Carton Not Square at Discharge

- When intermittent, check for a missing carton feed lug.
- When constant, the transport conveyor chains are not in sync.
- The carton may not be secure between the transport lugs.
- Check for chain stretch; one chain may be stretched more than the other.
- Check the flap guide settings.
- Check tuck closing belt – it may be set too fast.

Major Flaps Open

- Check cam timing.
- Check for proper positioning of stationary guides at the closing unit.
- Check for proper distance between transport lugs.
- Check for foreign materials in guide work.

Minor Flaps Open

- Check the flap closer timing.
- Check for carton material jammed in the guides.
- The closing guides may be set too far from the flap closer. Check that adequate clearance exists between the guide and the flap closer.
- Check that the top rails are not too tight.
- Check for tight or missing transport lugs.
- Check for improper loading that is causing open minor flaps.
- Check offsets on servo.
System Messages

If the system stops as a result of a fault, use the following table to locate and resolve the problem. When the problem is resolved, press the Reset button, then the Start button to home the machine, then résumé operation.

<table>
<thead>
<tr>
<th>Fault Message</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Left Side Flap Tucker Servo Faulted</td>
<td>A drive fault exists on the left side flap tucker. See the drive status screen.</td>
</tr>
<tr>
<td>2) Left Side Phase Chain Servo Faulted</td>
<td>A drive fault exists on the left side phase chain. See the drive status screen.</td>
</tr>
<tr>
<td>3) Left Side Datum Chain Servo Faulted</td>
<td>A drive fault exists on the left side datum chain. See the drive status screen.</td>
</tr>
<tr>
<td>4) Right Side Datum Chain Servo Faulted</td>
<td>A drive fault exists on the right side datum chain. See the drive status screen.</td>
</tr>
<tr>
<td>5) Right Side Phase Chain Servo Faulted</td>
<td>A drive fault exists on the right side phase chain. See the drive status screen.</td>
</tr>
<tr>
<td>6) Right Side Flap Tucker Servo Faulted</td>
<td>A drive fault exists on the right side flap tucker. See the drive status screen.</td>
</tr>
<tr>
<td>7) Bucket Chains Servo Faulted</td>
<td>A drive fault exists on the bucket conveyor drive. See the drive status screen.</td>
</tr>
<tr>
<td>8) Rotary Carton Feeder Servo Faulted</td>
<td>A drive fault exists on the carton feeder. See the drive status screen.</td>
</tr>
<tr>
<td>21) Left Side Flap Tucker Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>22) Left Side Phase Chain Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>23) Left Side Datum Chain Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>24) Right Side Datum Chain Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>25) Right Side Phase Chain Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>26) Right Side Flap Tucker Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>27) Bucket Chains Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>28) Carton Feeder Homing Failure</td>
<td>Check axis position, for obstruction, re-home or reset zero position</td>
</tr>
<tr>
<td>41) Miscellaneous Alarms:</td>
<td></td>
</tr>
<tr>
<td>42) No Plant Air Pressure Detected</td>
<td>Low system air pressure. Check air supply.</td>
</tr>
<tr>
<td>43) Glue System is not Ready</td>
<td>Check glue system is ON and heated</td>
</tr>
<tr>
<td>45) Carton Feed Error (Max Carton Misfeeds)</td>
<td>Check carton feed for jam</td>
</tr>
<tr>
<td>47) Jam at Barrel Loader.</td>
<td>Clear jam then press Reset.</td>
</tr>
<tr>
<td>Fault Message</td>
<td>Action</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>49) Datecoder is not Ready</td>
<td>Enable Datecoder</td>
</tr>
<tr>
<td>50) Cycle E-Stop Button, then press Reset</td>
<td>Cycle E-Stop Button, then press Reset</td>
</tr>
<tr>
<td>51) Carton Magazine Feed Belt VFD Fault</td>
<td>A drive fault exists on the feed belt VFD. See the drive status screen.</td>
</tr>
<tr>
<td>54) Downstream Equipment is not Ready</td>
<td>Activate downstream equipment</td>
</tr>
<tr>
<td>55) Case Packer is Not Ready</td>
<td>Check case packer status</td>
</tr>
<tr>
<td>56) Magazine Feed Belt VFD Faulted</td>
<td>A drive fault exists on the feed belt VFD. See the drive status screen.</td>
</tr>
<tr>
<td>65) Carton Magazine Low.</td>
<td>Load Cartons.</td>
</tr>
<tr>
<td>66) Carton Magazine Loading Failure</td>
<td>Check for jammed carton at magazine throat.</td>
</tr>
<tr>
<td>67) Barrel Loader Jammed</td>
<td>An overpressure state exists on the barrel loader. Check for jams not allowing barrel loader motion</td>
</tr>
<tr>
<td>68) Remote Jog is enabled</td>
<td>The remote jog is enabled</td>
</tr>
<tr>
<td>69) Misplaced Carton at Left Flap Tucker</td>
<td>Check for jammed carton.</td>
</tr>
<tr>
<td>70) [Y]Remote Jog Enabled</td>
<td>The remote jog is enabled</td>
</tr>
<tr>
<td>71) HMI E-Stop Button is Pressed</td>
<td>The E-Stop on the HMI has been pressed.</td>
</tr>
<tr>
<td>72) Infeed E-Stop Button is Pressed</td>
<td>The E-Stop on the infeed has been pressed.</td>
</tr>
<tr>
<td>73) Discharge E-Stop Button is Pressed</td>
<td>The E-Stop on the discharge has been pressed.</td>
</tr>
<tr>
<td>75) Carton Feeder Operator Side Door is Open</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>76) Carton Feeder NonOp Side Door is Open</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>77) Carton Exit NonOp Side Door is Open</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>78) Carton Exit Op Side Door is Open</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>91) OIT E-Stop was Pressed</td>
<td>The E-Stop on the HMI has been pressed.</td>
</tr>
<tr>
<td>92) Infeed E-Stop was Pressed</td>
<td>The E-Stop on the infeed has been pressed.</td>
</tr>
<tr>
<td>93) Discharge E-Stop was Pressed</td>
<td>The E-Stop on the discharge has been pressed.</td>
</tr>
<tr>
<td>95) Carton Feeder Op Side Door was Opened</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>96) Carton Feeder NonOp Side Door was Opened</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>97) Carton Exit NonOp Side Door was Opened</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>98) Carton Exit Op Side Door was Opened</td>
<td>Close door or check door switch.</td>
</tr>
<tr>
<td>141) Operator Stop Commanded</td>
<td>Machine is in Stop Mode.</td>
</tr>
<tr>
<td>142) Stop Button is Pressed</td>
<td>Machine is in Stop Mode.</td>
</tr>
<tr>
<td>144) Main Contactor Not Engaged</td>
<td>Press Reset</td>
</tr>
<tr>
<td>146) Drive Train Not Ready</td>
<td>Wait for drives to be ready.</td>
</tr>
</tbody>
</table>
### Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>Air Blow-Off</td>
<td>An air jet used to remove a carton designated for rejection after machine discharge.</td>
</tr>
<tr>
<td>Auto-Tensioner</td>
<td>A device that is used to automatically retract the chains of a conveyor to eliminate excess slack.</td>
</tr>
<tr>
<td>Barrel Loader</td>
<td>A section of the machine that pushes the load from the buckets into the cartons.</td>
</tr>
<tr>
<td>Bucket</td>
<td>A container mounted to the bucket conveyor chain designed to carry one load.</td>
</tr>
<tr>
<td>Bucket Conveyor</td>
<td>The conveyor that transports a load in a bucket into the cartoner.</td>
</tr>
<tr>
<td>Carton Magazine</td>
<td>An operator loaded conveyor that transports unopened cartons to the pick off point.</td>
</tr>
<tr>
<td>Carton Stops</td>
<td>Spring loaded devices at the magazine throat that hold the cartons in position for pick off by the Carton Feed Assembly.</td>
</tr>
<tr>
<td>Compression Rails</td>
<td>A set of rails used to hold the flaps securely while the glue sets.</td>
</tr>
<tr>
<td>Discharge Unit</td>
<td>A unit that removes the cartons from the transport lugs and conveys them out of the machine (also referred to as “Speed Belts”).</td>
</tr>
<tr>
<td>Emergency Stop</td>
<td>A pushbutton that immediately stops all functions of the machine by interrupting power.</td>
</tr>
<tr>
<td>Flap Tucker</td>
<td>An arm that rotates to close the non-loading side minor flaps of the carton in the transport.</td>
</tr>
<tr>
<td>Flap Guides</td>
<td>Bars used to guide the flaps closed as the carton travels through the transport.</td>
</tr>
<tr>
<td>Glue Closing Unit</td>
<td>The unit on the machine that handles the operation of guiding and gluing the flaps closed before traveling through the compression rails.</td>
</tr>
<tr>
<td><strong>Glue Gun</strong></td>
<td>A device that applies glue on the carton flap.</td>
</tr>
<tr>
<td><strong>High Load</strong></td>
<td>A load that is sitting in the bucket at an abnormal elevation.</td>
</tr>
<tr>
<td><strong>Indramat</strong></td>
<td>The servo controller for the machine that controls all timing of the servo system.</td>
</tr>
<tr>
<td><strong>Remote Jog Box</strong></td>
<td>A pushbutton remote control connected to a long cord that allows the operator easy movement around the machine while checking machine operation.</td>
</tr>
<tr>
<td><strong>Loading Guides</strong></td>
<td>An interchangeable stationary kit that acts as a “chute” to align product during loading from the bucket conveyor to the carton.</td>
</tr>
<tr>
<td><strong>Magazine Throat</strong></td>
<td>The area of the machine where the cartons are picked off by the carton feed assembly for placement in the transport lugs.</td>
</tr>
<tr>
<td><strong>Main Frame</strong></td>
<td>The unit that supports the main body of the machine.</td>
</tr>
<tr>
<td><strong>Motor Drive</strong></td>
<td>The unit of the machine that provides the primary power.</td>
</tr>
<tr>
<td><strong>Photo eye</strong></td>
<td>A light sensitive device used to detect objects.</td>
</tr>
<tr>
<td><strong>PLC</strong></td>
<td>Programmable Logic Controller – an electronic control device that executes the operational program to manage the operation of the cartoner.</td>
</tr>
<tr>
<td><strong>PLS</strong></td>
<td>Programmable Limit Switch – an electronic cam box controlling device that executes electronic cams that control the timing of certain devices on the cartoner.</td>
</tr>
<tr>
<td><strong>Servo Motor</strong></td>
<td>A programmable drive motor that is cycled based on commands from the controller.</td>
</tr>
<tr>
<td><strong>Solenoid</strong></td>
<td>An assembly used as a switch, consisting of a coil and a metal core free to slide along the coil axis under the influence of the magnetic field. It is often used in pneumatic systems to switch air.</td>
</tr>
<tr>
<td><strong>Top Rail</strong></td>
<td>A bar located above the transport that holds the cartons down and within the transport lugs.</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>A conveyor that moves cartons through the machine.</td>
</tr>
<tr>
<td><strong>Transport Lugs</strong></td>
<td>Extensions of the transport that contact the carton to convey them through the machine.</td>
</tr>
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