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OPERATION AND MAINTENANCE MANUAL

THE PACKAGING ANSWER

VisionCorps

REVISION NUMBER: 1.0

TABLE OF CONTENTS

SECTION 1.0
CONTROLS AND STATIONS

1.0.1 CONTROL PANEL

The operator control panel is located next to the pouch magazine area and is the main interface between operator and machine.

Human Machine Interface (HMI) – Allen Bradley 10" touchscreen used to control most functions of machine operation.

E-Stop - will remove all energy external to the machine, electrical and air. Electronics will retain power along with servo motor position feedback.

Power switch - will remove power to the control electronics, as well as all power external to the machine.

Reset button - used to activate the power safety relay upon power up or after an E-Stop. Any time power is removed from the system the safety relay must be reactivated via this reset push button.

Key switch - used to lockout functions and setup on the machine. When locked out specific machine settings cannot be altered.

Stacklight – gives a visual indication of the current status of the machine.

1.0.2 REMOVABLE POUCH MAGAZINES

The pouch magazine of the system is designed and intended for a specific pouch. It is easily removed without the use of tools by pulling u on the handles and removing the magazine from the locator pins.

There is a sensor on every magazine to tell the system that the magazine is in place or has been removed from the machine. If the magazine is removed, operation will be halted and cannot be restored until the magazine is replaced. This is a safety consideration and will ensure the operator cannot reach into the machine while running.

Upon installation of the magazine, the operator will need to reset the fault on the control panel and them press the pouch feed enable button.

Pouches can be loaded into the magazine without interrupting machine operation. If the magazine is depleted of pouches, the system will generate a vacuum error while trying to remove a pouch and halt operation. The pouch feed arm will try to remove a pouch three (3) times before halting operation. This is to ensure that the pouches are actually depleted and allows the system to continue if pouches are present.

There are adjustment fingers located on the bottom of the magazine where the pouch is removed from the stack. These fingers help retain the rest of the stack during removal of the bottom pouch. These fingers should be adjusted as low as possible but not to interfere with the vacuum plate and its cups. If interference exists, pouches will be ripped off the leading cups or you may hear a slight clicking as the pouch is removed from the magazine. The magazine may also jump a bit during removal. Any of these conditions require adjusting one or more of the fingers a bit higher.

1.0.3 POUCH FEED ARM VACUUM PLATE

The pouch feed arm vacuum plate removes pouches from the magazine. The plate and magazine are paired and cannot be interchanged with other units. Pouches are held under vacuum and horizontally removed from the bottom of the magazine stack. This allows the operator to safely replenish the magazine without interrupting the cycle.

The pouch feed arm transports the pouch through the edge detection sensor and to the labeling station. From there the pouch is taken and transferred to the load area. Once this transfer is complete, the pouch feed arm returns to the magazine to remove another pouch and begin the sequence again.

If the pouch feed arm loses vacuum during operation, it will generate an error. Depending on the timing of the error, it will either pause the system or continue operation. Vacuum cups should be inspected regularly and replaced if any damage exists. Cup condition is directly related to system performance. Any holes or tears in the cups will result in problems removing pouches from the magazine area

Cups are easily replaced without tools and can be ordered through Urania at any time. Should persistent problems exist in removing pouches from the magazine, inspect the vacuum cups and check the plate for leaks or damage. You can also watch the vacuum sensor on the HMI designated for the pouch pickup/feed arm. Under normal operation, vacuum levels should reach about -20 in/hg when a pouch is present on the plate. Lower levels suggest the presence of a leak on the plate assembly.

1.0.4 EDGE DETECTION SENSOR

The edge detection sensor identifies both the leading and top edges of each pouch removed from the magazine. This allows for variation in the magazine pouch stack and lets the operator load faster, with less precision. Once the edges are determined for a specific pouch, the system does a series of calculations to ensure the pouch is presented to the labeler and load area in a consistent location. This sensor should never be moved, adjusted, or disabled once proper operation is established.

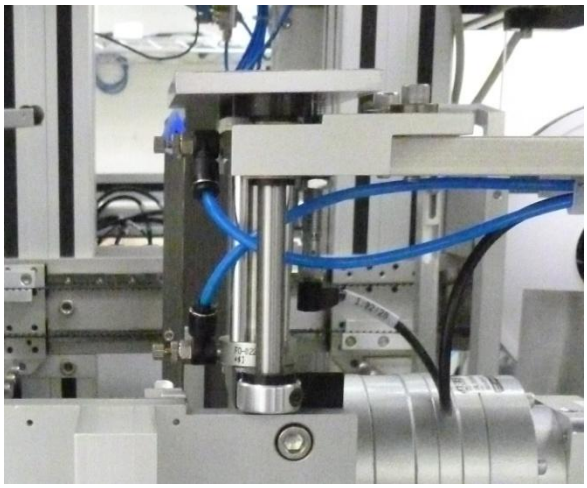
The edge detection sensor is a class 1 laser sensor and should never be stared into or pointed in a line of sight. The sensor is pointed straight downward on this system.

Please refer to section 2.0.5 for instructions on teaching this sensor.

1.0.5 LABELER AND BACKING PLATE (OPTIONAL)

The system is incorporated with an LSI label applicator and SATO print engine. For information regarding these units, please see the documentation supplied by these manufacturers.

Under the label application pad there is a backing plate system that flattens the pouch prior to application. This ensures a flat, straight label with no creases or distortions. The backing plate is sensed in its retracted position and any errors in this area would normally be caused by a bad or misadjusted sensor.



1.0.6 POUCH OPENING AND LOADING AREA

As the pouch is rotated downward by the pouch feed arm, it is positioned into the load area. Two (2) opposing opening arms converge on the pouch and remove it from the pouch feed arm with vacuum. As the opening arms grab the pouch, a set of gripper arms also converge on the pouch and clamp each side near the top. These grippers work in conjunction with the opening arms to open the pouch for loading. Each of these motions is fully programmable to create a series of opening profile options. Once the opening and gripper arms reach their programmed position, loading of the pouch can be initiated.

After the pouch is loaded, the opening arms release vacuum and only the grippers hold the loaded pouch. These grippers then pull apart, creating a straight, taut top edge of the pouch. This condition is imperative in creating a straight seal by the sealing head.

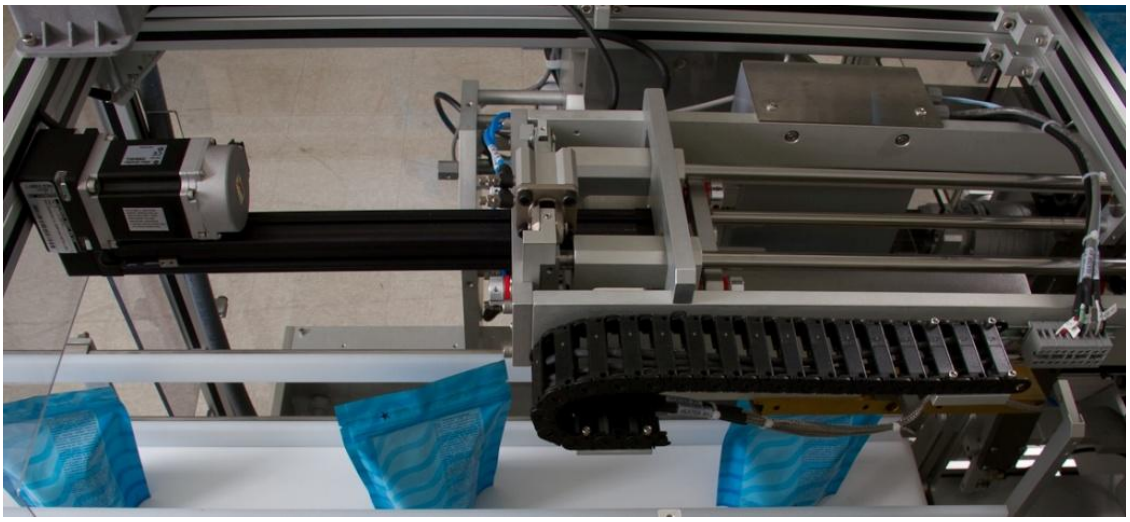
The opening arms work similar to the pouch feed arm and have vacuum sensors on the control panel to monitor operation. Any problems with pouch opening could be a result of a vacuum leak on either of these plates. The opening arms will try to open a pouch three (3) times before rejecting it to the rework bin. Other possible reasons for opening issues are upside down pouches in the magazine, pouches being presented too low to the opening arms, and cup alignment on the opening arms. The vacuum cups on the opening arms work best in a staggered pattern at 90 degrees from the opposing arm as shown.

1.0.7 TRANSPORT AND BAR SEALER

After the pouch is pulled taut by the gripper arms in the load area, the transport device moves into place and removes the pouch from the load area.

The pouch is transported to the exit conveyor, and heat sealed during this operation. The speed of the transport can be digitally adjusted based on load weights, pouch materials, and cycle rates to optimize the quality of the seal. Once the sealing parameters are met, the pouch is dropped to an exit conveyor and leaves the system.

The transport device has a clamping mechanism that opens and closes to grab and release the pouch. There is a rubber strip opposite the brass heating bar that should be replaced as wear occurs. This strip helps control the pouch during movement and operation. The motion of the device is servo controlled and its position is always monitored.



The transport carriage contains the brass heating bar that is responsible for sealing the pouch. This bar contains the two heating elements and the thermocouple which are responsible maintaining and verifying the temperature of the bar. The brass section is made up of two parts with the front being removable to change the profile of the final seal on the pouch. This feature allows the user to easily and quickly change to any profile seal they prefer.

1.0.8 PRODUCT LOAD GATE (OPTIONAL)

The product load gate is located between the customer supplied scale or weighing device and the pouch opened by The Packaging Answer. They are designed based on product density, pouch size, and final fill weight. A system may have multiple load gates to accommodate the entire range of pouches processed by the customer.

The load gate has two unique motions that allow the device to plunge inside an open pouch and scissor open to release the product to the pouch. The gate also acts as a staging area and can be filled at any time following a successful pouch loading.

Gate removal and changeover is simple. Two ¼-20 screws hold the device to the main system and there is one quick disconnect senor with two air lines. Disconnects on the air lines are staggered male and female so they cannot be assembled incorrectly.

1.0.9 EXIT CONVEYOR

Pouches are removed from the system via a powered conveyor. The conveyor has its own control box containing a power switch, forward / reverse toggle, and a speed controller. The conveyor plugs into the 120V outlet mounted to the base of the Packaging Answer and its height can be adjusted about 7" vertically depending on pouch size.

The conveyor may also have a set of quick drop on guides to be used with smaller pouches to help control them as they move down the length of the device.

SECTION 2.0
SETUP AND OPERATION

2.0.1 PREPARING THE PACKAGING ANSWER SYSTEM

Install the proper magazine into the machine by dropping it onto the holders at the magazine station. Be sure the in position sensor at the bottom of the magazine lines up with the in position sensor on the machine. Load pouches in the magazine as explained in the pouch conditioning section of the manual.

Install the proper vacuum plate to the pouch feed arm carriage. It is held in position with two hex head screws and a vacuum hose. The vacuum plate must match the magazine being used. After installing the vacuum plate, make sure the vacuum hose is connected securely.

Verify the location of the vacuum cups on the opening arms. Cups should be installed as outlined in the Opening Arm cup diagrams in the assembly drawing section of the manual. Each type of pouch has an optimal cup arrangement. Skew the cups from arm to arm as previously explained and make sure unused cup pins have caps installed on them. .

Install the proper Load Gate for the product and pouch combination being processed.

Select the proper pouch configuration from the HMI menus to electronically adjust all the pouch processing positions and speeds.

If not already done, turn on the conveyor power via the control box located along the side plate of the conveyor's framework. Check the adjustment height of the conveyor and verify that the proper brass seal profile is installed on the sealing bar assembly.

2.0.2 OPERATION OF THE PACKAGING ANSWER SYSTEM

Turn on the power switch located on the control panel and wait for the HMI to boot and display the main menu.

Select the proper operating temperature for the brass heating bar using the temperature controller. The system will be ready to operate once the temperatures reach its preset level.

Press the rest button to clear any errors and then the machine start button. The vacuum pump should energize and air will be supplied to the system. Once the servos initialize and locate home, the machine is functional and ready to operate.

Upon startup, all settings and positions from the previous run will be installed. At this time it is a good idea to double check that the magazine, pickup plate, opening arm cup arrangement, and brass heater bar all match the pouch being processed. This will ensure all subsystems will operate and a good pouch test will occur.

It is a good idea to run a few single cycles through the machine to verify all positions and operations. Pressing the feed one pouch button will send a single pouch through the entire loading and sealing process. Do this a few times while watching each station for any issues or necessary adjustments. The main areas to concentrate on are:

- Pouch feed arm vacuum plate and magazine alignment – the vacuum cups of the plate should enter the middle of the magazine base cutouts and grab the pouch about ¼" in from the leading edge.

- Pouch removal from magazine – should be clean and no interference between cups and retaining fingers on the side of the magazine.

- Label alignment – use the adjusting screws of the labeler stand to position the label on the pouch

- Pouch presentation height and alignment at the load area – pouch top edge should be located about 1/8" above the opening arm cups and centered on the gripper arms.

- Pouch opening – should be symmetrical and proper for gate opening. Use the gripper and opening arms to create the opening.

- Loading – the load gate should enter the pouch cleanly and allow for ample fill time during product dump.

- Gripper pulling – pouch should be pulled taut but not over-stretched

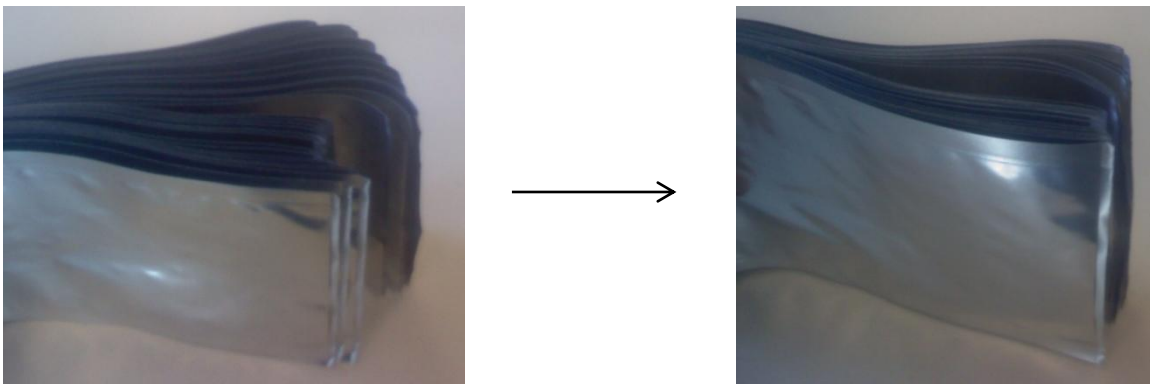
- Seal quality – seal quality can be tuned using the bar sealer temperature, seal time, and transport speed.

Once the operator is satisfied with the pouches being cycle through the machine, press the pouch feed enable button to put the system in automatic mode. The operator will need to keep both the pouch and titration plate magazines filled with product during operation. If the titration plate magazine reaches 5 plates, the machine will pause. Once the operator replenishes the plates, the pouch feed enable button must be pressed again to continue operation.

2.0.3 POUCH CONDITIONING & MAGAZINE LOADING

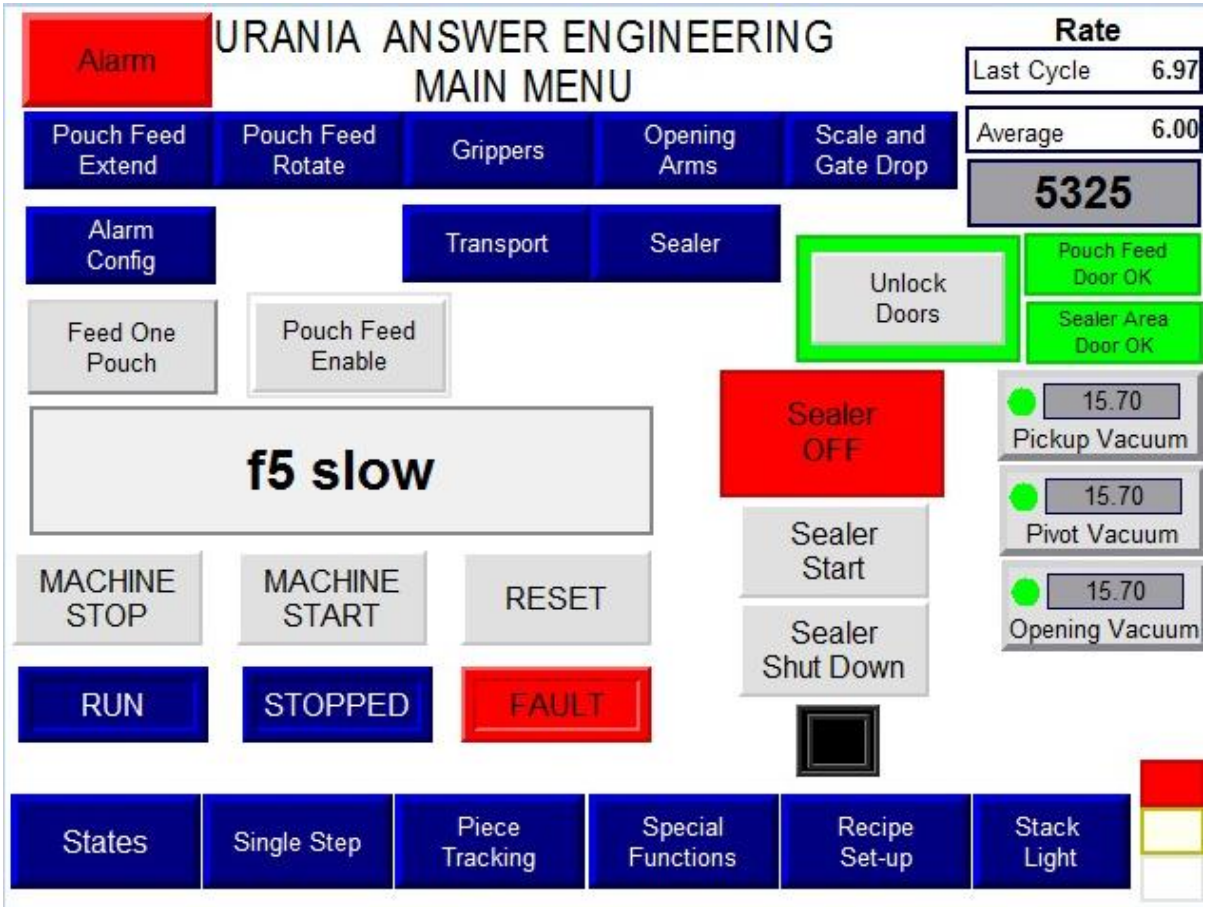
Pouches will be loaded with the (optional) label side facing up and the open end facing toward the operator as shown below.

Pouches should be handled in a comfortable number and quickly stacked so that top (open end) edges are somewhat aligned. Non-zipper pouches require far less care and can be handled like a deck of cards during conditioning.



Make sure all pouches are facing the same way and that they are loaded into the magazine as neat as possible.

2.0.4 HMI SCREENS AND OPERATIONS



The main screen of the Urania Packaging Answer controls all the top level functions of the machine and allows various levels of access in conjunction with the lockout keyswitch on the control panel. This screen also gives the current status of the entire system as well as various subsystems. This screen is displayed during normal operation and upon startup.

Blue Subsystem Buttons

Alarm – this button is used to access the alarm history screen of the machine. Every error condition and general alert of the system is logged and their history can be accessed using this button.

Pouch Feed Extend – used to access the screen responsible for controlling the horizontal movement of the pouch feed arm that removes pouches from the magazine and presents them to an optional labeler. It is the vacuum plate with the red (bellowed) cups.

Pouch Feed Rotate – used to access the screen responsible for controlling the rotary motion of the pouch feed arm that removes pouches form the magazine, presents them to an optional labeler, then rotates to the load area.

Grippers – used to access the screen responsible for controlling the four (4) rubber tipped grippers that are used to open and pull taut the pouch in the load area.

Opening Arms – used to access the screen responsible for controlling the two (2) opening arms that remove the pouch from the pouch feed arm and open it for loading. These are the plates with the orange or blue rectangular vacuum cups without bellows.

Scale & Gate Drop – used to access the screen responsible for controlling settings and status of the scale, load gate, nitrogen injection, and settling devices.

Alarm Config – used to access the screen responsible for changing the settings and output of alarm messages.

Transport – used to access the screen responsible for controlling the motion of the device that carries the loaded pouches away from the load area and drops them to the exit conveyor. The transport also contains the bar sealer responsible for sealing the pouch.

Sealer – used to access the screen responsible for adjusting the various parameters of the heat sealer.

Operational Buttons

Feed One Pouch – used in conjunction / opposite to the pouch feed enable button. This button will allow the operator to process one pouch through the system while the system is paused. A paused condition is achieved by deactivating the pouch feed enable button located to its right. Both of these buttons cannot be used simultaneously.

Pouch Feed Enable – used to cycle the system from automatic mode to a paused mode. When highlighted, pouches are automatically removed from the magazine and processed through the rest of the system (if the system is active). This button can be toggled on or off to control operation. When disabled, the feed one pouch button can be used instead. When illuminated with a green border, this mode is enabled.

Current Pouch – the large area under the Feed / Enable buttons displays the current recipe being processed by the system.

Status Buttons

Machine Start – used to start the system during initial power up, after a fault recovery, or following an E-stop condition. Works in conjunction with the machine stop and reset buttons located to its right. Can be used when the status button is showing a stopped condition (yellow) and all faults are reset.

Machine Stop – used to stop the system when the status button is showing run (green) and all faults are reset.

Reset – used to reset any faults or alarms prior to initiating a cycle. When the blue button is illuminated, it must be depressed to continue operation. Under normal circumstances, pressing this button is usually followed by pressing the machine start button.

Run / Stopped / Fault – shows the current status of the machine. Run will be illuminated (green) during normal operation, stopped (yellow) following power up or fault recovery, and fault (red) during an error condition.

Blue Function Buttons

States – used to access the screen showing the current states of the machine and its subsystems.

Single Step – used to access the screen controlling the single step functions of the machine. Single step is useful during setup, debugging, and general maintenance. In single step mode, the operator can process a pouch through each individual station manually, or on an automated time delayed function.

Piece Tracking – used to access the screen showing all processes that are being tracking through the machine. Helps operator by logging failures, processed pouches, and current status of each subsystem.

Special Functions – used to access the screen controlling the dry cycling of the machine. It can be used to disable the load device during setup and troubleshooting to conserve product.

Recipe Setup – used to access the screen where pouch recipes are entered, recovered, and stored for future use. Allows the comparison of the current setup to one stored in memory without requiring changes. Makes switching from setup to setup easy and reliable.

Stack Light – used to access the screen giving all information regarding the current state of the three (3) color stacklight. Also explains what condition is controlling the light display and helps the operator to diagnose errors and status. The color display to the right of this button will match the output of the stacklight on top of the control box.

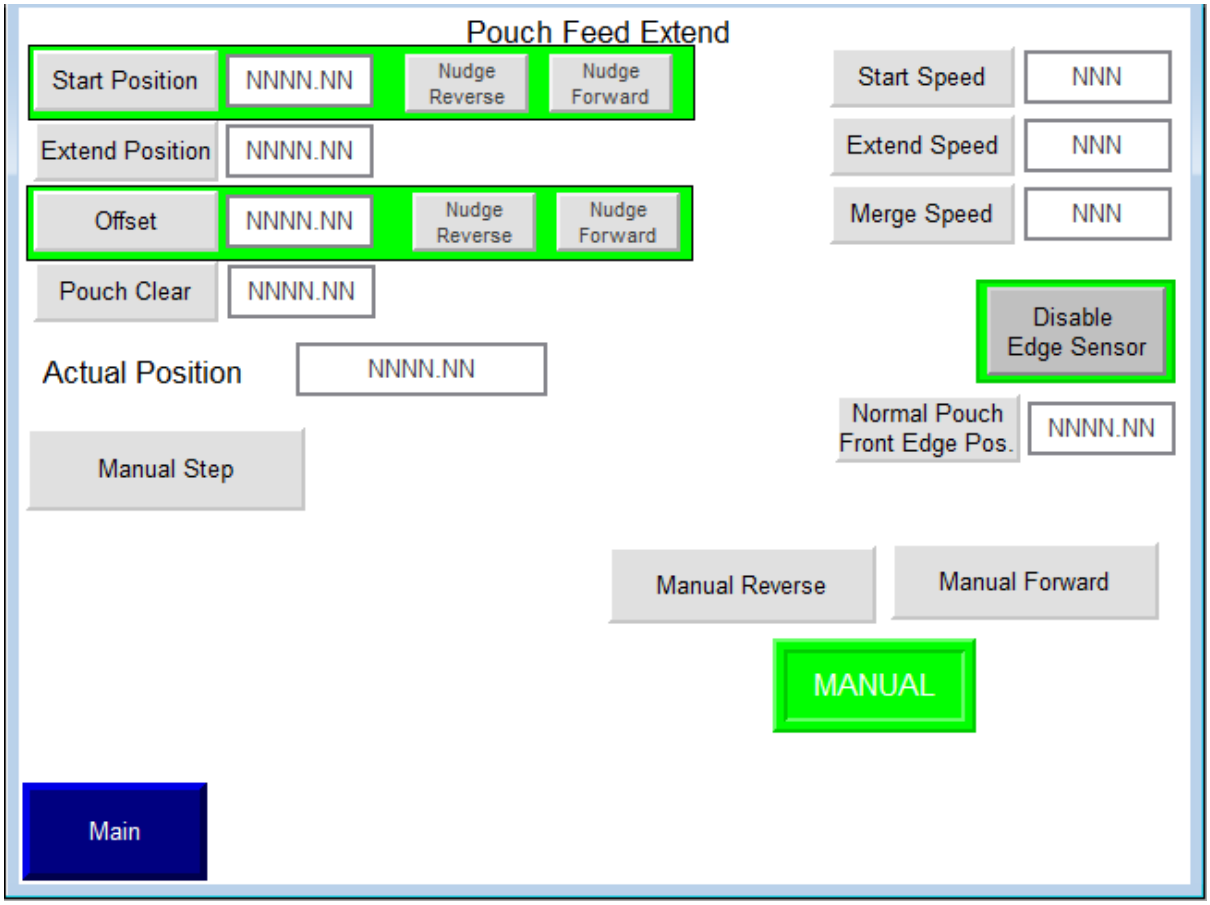
Status Screen Area

Rate – shows the current cycle rate as well as the average of the last 10 completed cycles. The display below the rates shows the number of pouches processed since the last reset of the counter.

Un/Lock Doors - used to lock and unlock the safety doors without using an E-stop button. Allows the operator to safely enter the system by controlling the locking safety switches located on the two (2) access doors. If lock is displayed, the button must be pressed before the machine will operate. Indicators to the right of this button show the status of each door.

Sealer Start / Shut Down – used to turn the heat sealer off and on. The current status is shown directly above the control buttons.

Vacuum Levels – show the current vacuum readings at each of the stations linked to the vacuum system. Also controls popup menus where vacuum thresholds and limits are set.



The pouch feed extend screen is used to display and adjust the position and speed of the pouch feed arm that removes pouches from the magazine. It also controls the linear offset value with respect to the edge detection sensor.

The nudge buttons will move the arm a small amount at a time for fine tuning. Large steps can be achieved by selecting the actual position which will open a numeric keypad for operator defined entries. You may only nudge the current (highlighted) position of the system. Positions are shown in machine specific units (not inches or mm) and speeds are shown in percentage of maximum speed. Care should be taken in adjusting speeds so that they are not too aggressive. Running motions too fast will put unnecessary stress on mechanisms, servo motors, and generate excess torque. Speeds should be reduced to a point where the system as a whole is not waiting for any one subsystem.

Position Buttons

Start – position of the pouch feed arm when it is under the magazine and ready to extend for pouch pickup. The start position should be so that the right side vacuum cups are about ¼" in from the edge of the pouch.

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Extend – with the edge sensor disabled, this value will set the horizontal position of the pouch before rotating down to the load area. This position is a critical part of the operation as it determines the centering of the pouch in the Opening Arms and Grippers during loading. This value should be adjusted so that the pouch is centered on the opening arms after it is rotated to the load position. Typical values are from 15.00 to 15.50.

Offset – see 2.0.5 "Edge Sensor Operation"

Pouch Clear – see 2.0.5 "Edge Sensor Operation"

Actual – shows the actual position of the current (highlighted) step of the process.

Manual Step – cycles the system one step when placed in the manual operational mode.

Speed Buttons

Start – linear operating speed during the move of the pouch feed arm back to the pouch magazine after transferring a pouch to the load area. Normally set to about 95% and is not affected by the use of the edge sensor.

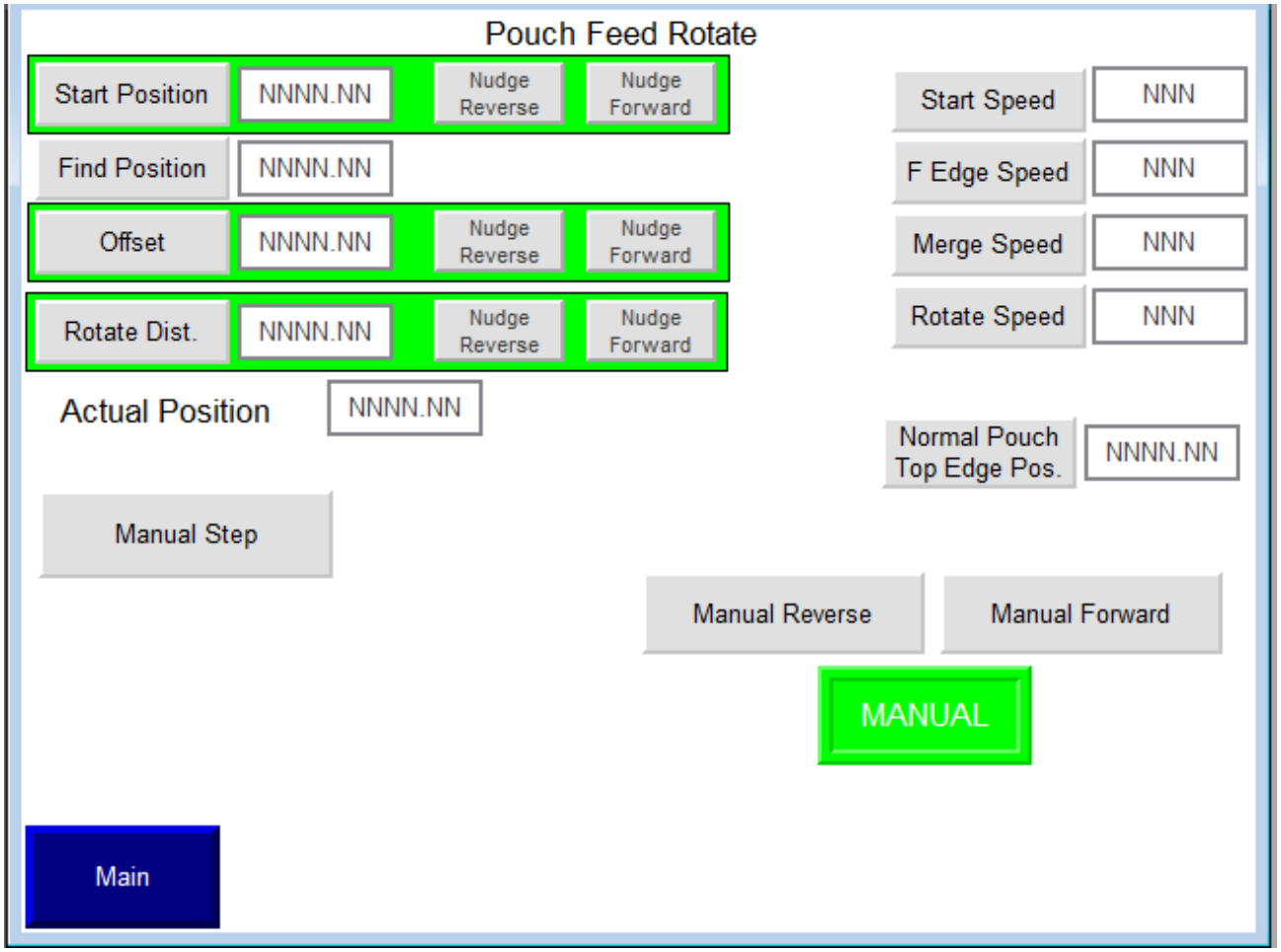
Extend – with the edge sensor disabled, this is the linear operating speed of the pouch feed arm from the magazine to the labeling / rotate down area. This speed can be very aggressive (95%) when not using the edge sensor. When using the edge sensor, see 2.0.5 "Edge Sensor Operation".

Merge – see 2.0.5 "Edge Sensor Operation"

Disable Edge Sensor – this button will turn the edge sensor on or off. Pouches without zippers normally don't require the edge sensor. The front edge position should not be changed from its original setting.

Manual Forward / Reverse – these buttons will move the current operation considerably more than the nudge buttons (when the Manual display is illuminated).

Main – takes the operator back to the main menu of the system.



The pouch feed rotate screen is used to display and adjust the position and speed of the pouch feed arm that removes pouches from the magazine. This menu is used with respect to all rotational (not linear) movements of the vacuum plate.

The nudge buttons will move the pouch feed arm a small amount at a time for fine tuning. Large steps can be achieved by selecting the actual position which will open a numeric keypad for operator defined entries. You may only nudge the current (highlighted) position of the system. Positions are shown in machine specific units (not inches or mm) and speeds are shown in percentage of maximum speed. Care should be taken in adjusting speeds so that they are not too aggressive. Running motions too fast will put unnecessary stress on mechanisms, servo motors, and generate excess torque. Speeds should be reduced to a point where the system as a whole is not waiting for any one subsystem.

Position Buttons

Start – rotational position of the pouch feed arm when it is under the magazine and ready to extend for pouch pickup. The start position should be so that the vacuum cups are parallel to the base of the machine and centered on the slots in the bottom of the magazine.

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Find – see 2.0.5 “Edge Sensor Operation”

Offset – see 2.0.5 “Edge Sensor Operation”

Rotate Distance – rotational distance of the pouch feed arm from the labeling area to the loading area. This distance, once the edge sensing parameters are established, dictates the vertical load position of the pouch. This value is used to fine tune the height of the pouch at the load station. A greater distance will rotate the pouch further, thus lowering it at the load area. A smaller distance will raise the pouch in this area. Ideally, the pouch should be positioned so that the vacuum cups of the opening arms are about 1/8" below the top of the pouch during opening. The rotate distance is a quick and easy way to tweak the height of the pouch through the opening and sealing subsystems. The rotate distance can change considerably depending if the edge sensor is turned on or off.

Actual – shows the actual position of the current (highlighted) step of the process.

Manual Step – cycles the system one step when placed in the manual operational mode.

Speed Buttons

Start – rotational speed of the pouch feed arm when returning from the load area to the labeler area. Care should be taken to not make this move to violent as servo torque errors may occur.

F Edge – see 2.0.5 "Edge Sensor Operation"

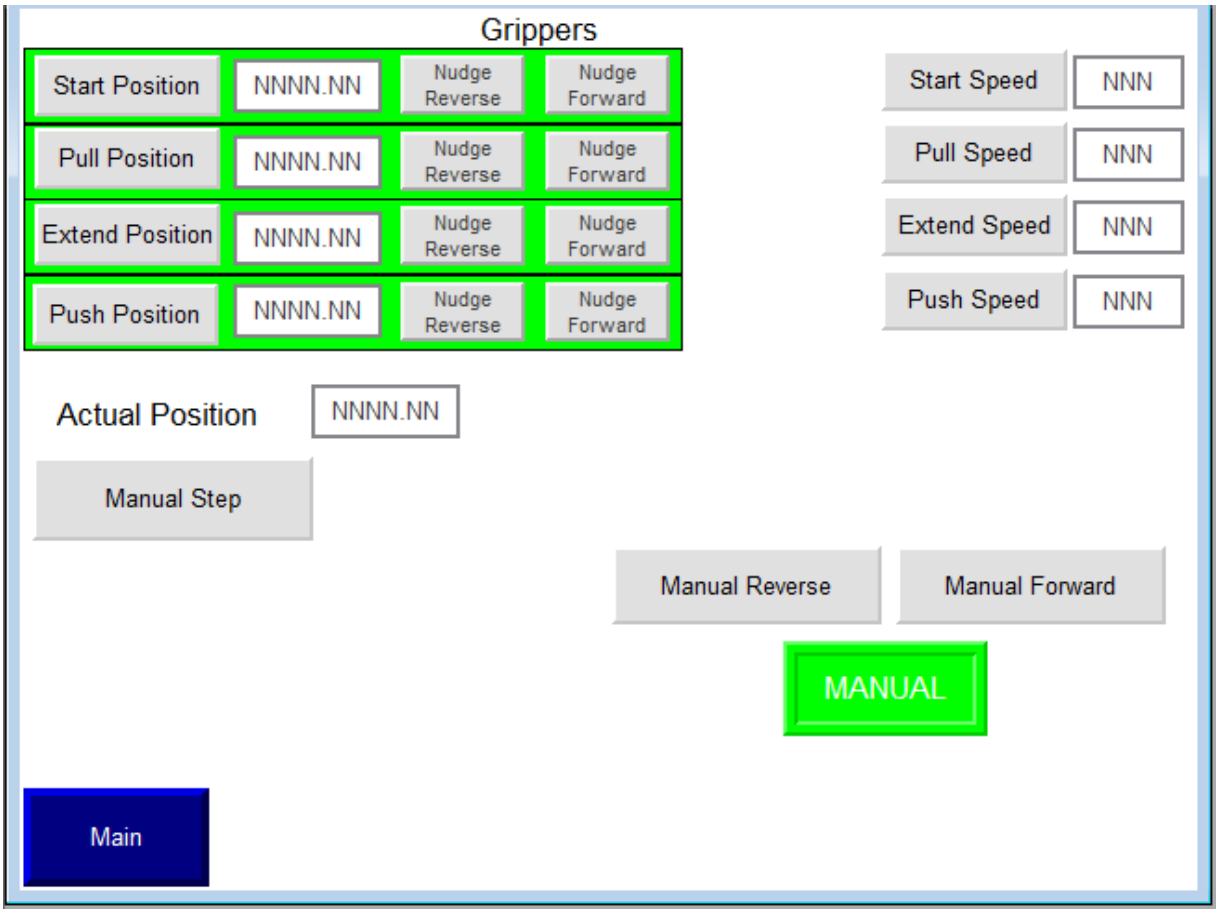
Merge – see 2.0.5 "Edge Sensor Operation"

Rotate – rotational speed of the pouch feed arm after labeling down to the load position. Care should be taken to not make this move to violent as servo torque errors may occur.

Normal Top Edge – this button shows the 'standard' top edge position and should not be changed from its original setting.

Manual Forward / Reverse – these buttons will move the current operation considerably more than the nudge buttons (when the Manual display is illuminated).

Main – takes the operator back to the main menu of the system.



The gripper screen is used to display and adjust the linear position and speed of the rubber tipped pouch grippers help open and pull the pouch taut.

The nudge buttons will move the plate a small amount at a time for fine tuning. Large steps can be achieved by selecting the actual position which will open a numeric keypad for operator defined entries. You may only nudge the current (highlighted) position of the system. Positions are shown in machine specific units (not inches or mm) and speeds are shown in percentage of maximum speed. Care should be taken in adjusting speeds so that they are not too aggressive. Running motions too fast will put unnecessary stress on mechanisms, servo motors, and generate excess torque. Speeds should be reduced to a point where the system as a whole is not waiting for any one subsystem.

Position Buttons

Start – linear position of the grippers before they clamp on a pouch for opening and pulling taut. The start position should be about ¼" in from the edge of each side of the pouch. The gripper assemblies are linked, so one adjustment will move both sets of gripper arms.

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Pull – linear position of the gripper arms as they pull the pouch taut after loading and before the transport removes the pouch. The grippers should be positioned so that the pouch is just closed, but not so much that the gripper tips slip off the edge of the pouch. This motion ensures straight seals with no wrinkles.

Extend – linear position of the grippers as a pouch is rotated into the load position. This position is changed when pouch width changes. The extend position should be as close to the pouch as possible without interfering with any movements of the pouch feed arm during rotation.

Push – linear position of the gripper arms during pouch processing by the opening arms. This movement works in conjunction with the position of the opening arms to control the shape of the pouch for loading.

Actual – shows the actual position of the current (highlighted) step of the process.

Manual Step – cycles the system one step when placed in the manual operational mode.

Speed Buttons

Start – speed of the gripper arms moving from the extend (home) position to the start position in preparation to close on the pouch.

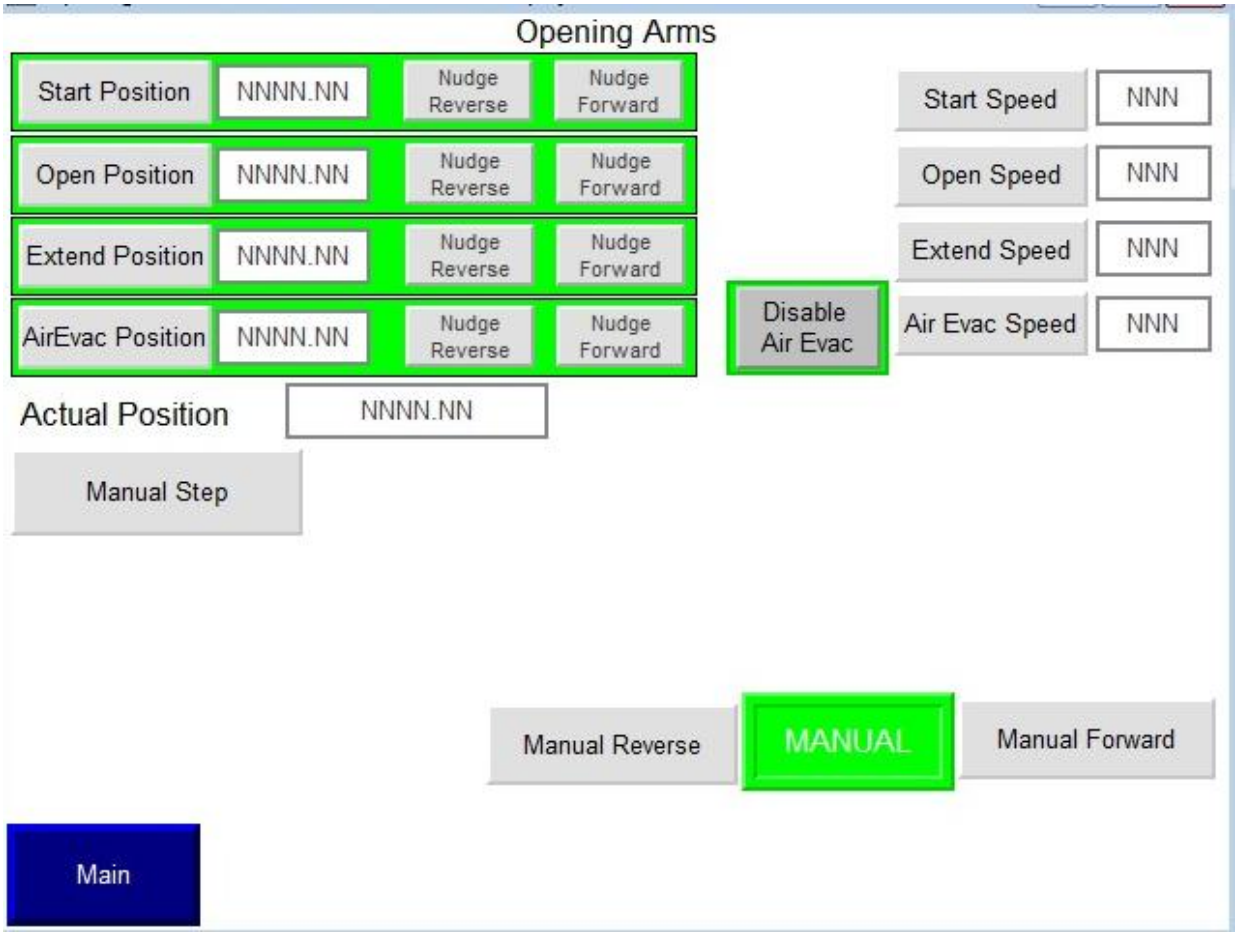
Pull – speed of the gripper arms when pulling the pouch taut.

Extend – speed of the gripper arms when moving from the pouch release point back to the extend (home) position.

Push – speed of the gripper arms when moving inward during the processing of the pouch by the opening arms. This speed works in conjunction with the speed of the opening arms.

Manual Forward / Reverse – these buttons will move the current operation considerably more than the nudge buttons (when the Manual display is illuminated).

Main – takes the operator back to the main menu of the system.



The opening arms screen is used to display and adjust the position and speed of the arms which open the pouch at the load station. There are two (2) arms which control the opening of the pouch. Their movement is linked and adjusting a single value will control both arms.

The nudge buttons will move the opening arms a small amount at a time for fine tuning. Large steps can be achieved by selecting the actual position which will open a numeric keypad for operator defined entries. You may only modify the current (highlighted) position of the system. Positions are shown in machine specific units (not inches or mm) and speeds are shown in percentage of maximum speed. Care should be taken in adjusting speeds so that they are not too aggressive. Running motions too fast will put unnecessary stress on mechanisms, servo motors, and generate excess torque. Speeds should be reduced to a point where the system as a whole is not waiting for any one subsystem.

Position Buttons

Start – the position of the opening arms at the point where they meet under the load area. The cups should slightly interfere as to ensure good vacuum on the pouch.

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Open – position of the opening arms when the pouch is opened by the vacuum cups. Use this value to control the opening distance and, in conjunction with the grippers, the shape of the pouch's opening. The open position should never be so far as to cause the pouch to be pulled off the vacuum cups.

Extend – the retracted position of the opening arms, also considered the home position. The arms should be positioned as to avoid interference with any other motion of the machine.

Air Evac Position – controls the position of the opening arms when using the air evacuation feature of the system. The air evacuation process is used to remove air from the pouch after loading is complete to eliminate a "pillow" type condition (after sealing) with small volumes of product. The position is how far the opening arms will close on (or compress) the pouch after loading.

Actual – shows the actual position of the current (highlighted) step of the process.

Manual Step – cycles the system one step when placed in the manual operational mode.

Speed Buttons

Start – linear speed of the opening arms as they travel to the start position (meeting at the pouch).

Open – linear speed of the opening arms as they obtain vacuum and retract to open the pouch for loading. The open speed can change dramatically from pouch to pouch. If the system exhibits trouble opening pouches, slowing down the open speed should help the situation.

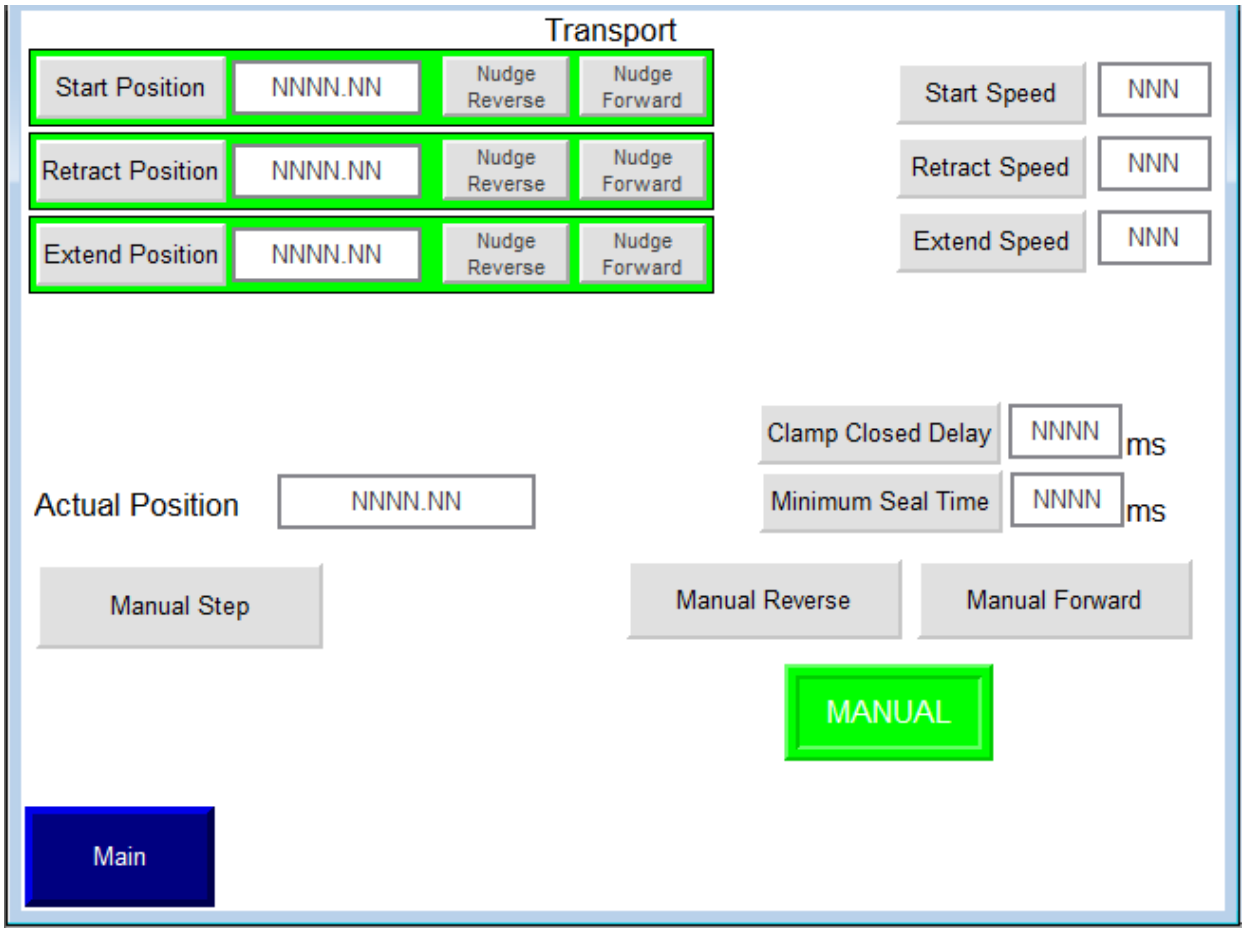
Extend – linear speed of the opening arms as they release vacuum from the loaded pouch and travel back to their retracted position.

Air Evac Speed – speed at which the air evacuation process is completed. Faster speeds will improve cycle time, but may cause product to be pushed out of the pouch.

Diasble Air Evac – turns the air evacuation process on or off. Normally the air evacuation is only useful on pouches with small loads.

Manual Forward / Reverse – these buttons will move the current operation considerably more than the nudge buttons (when the Manual display is illuminated).

Main – takes the operator back to the main menu of the system.



The transport screen is used to display and adjust the position and speed of the servo transport to the conveyor. The transport is used to remove the pouch from the load area, control the seal time, and place the processed pouch on the exit conveyor. This screen controls the linear motion of the transport and will highlight the current step in the process.

The nudge buttons will move the transport a small amount at a time for fine tuning. Large steps can be achieved by selecting the actual position which will open a numeric keypad for operator defined entries. You may only modify the current (highlighted) position of the system. Positions are shown in machine specific units (not inches or mm) and speeds are shown in percentage of maximum speed. Care should be taken in adjusting speeds so that they are not too aggressive. Running motions too fast will put unnecessary stress on mechanisms, servo motors, and generate excess torque. Speeds should be reduced to a point where the system as a whole is not waiting for any one subsystem.

Position Buttons

Start – the position of the transport just before it removes the pouch from the load area. This position works in conjunction with the extend position of the gripper arms. The transport should be positioned as close to the gripper arms without creating interference as the arms extend to their widest point.

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Retract– position of the transport where it places the pouch onto the conveyor.

Extend – position of the transport where the pouch is grabbed and removed from the load area. This position should be determined by aligning the leading end of the grab bars about an inch past the trailing edge of the pouch after the gripper arms pull it taut.

Actual – shows the actual position of the current (highlighted) step of the process.

Manual Step – cycles the system one step when placed in the manual operational mode.

Speed Buttons

Start – transport speed from point where the pouch is placed on the conveyor back to the start position. This speed generally will not affect cycle time and can be rather slow.

Retract – transport speed from the load area to the drop point over the conveyor. This speed can change drastically depending on the weight of the filled pouch. Lighter pouches can be moved much more quickly than heavy ones during this operation.

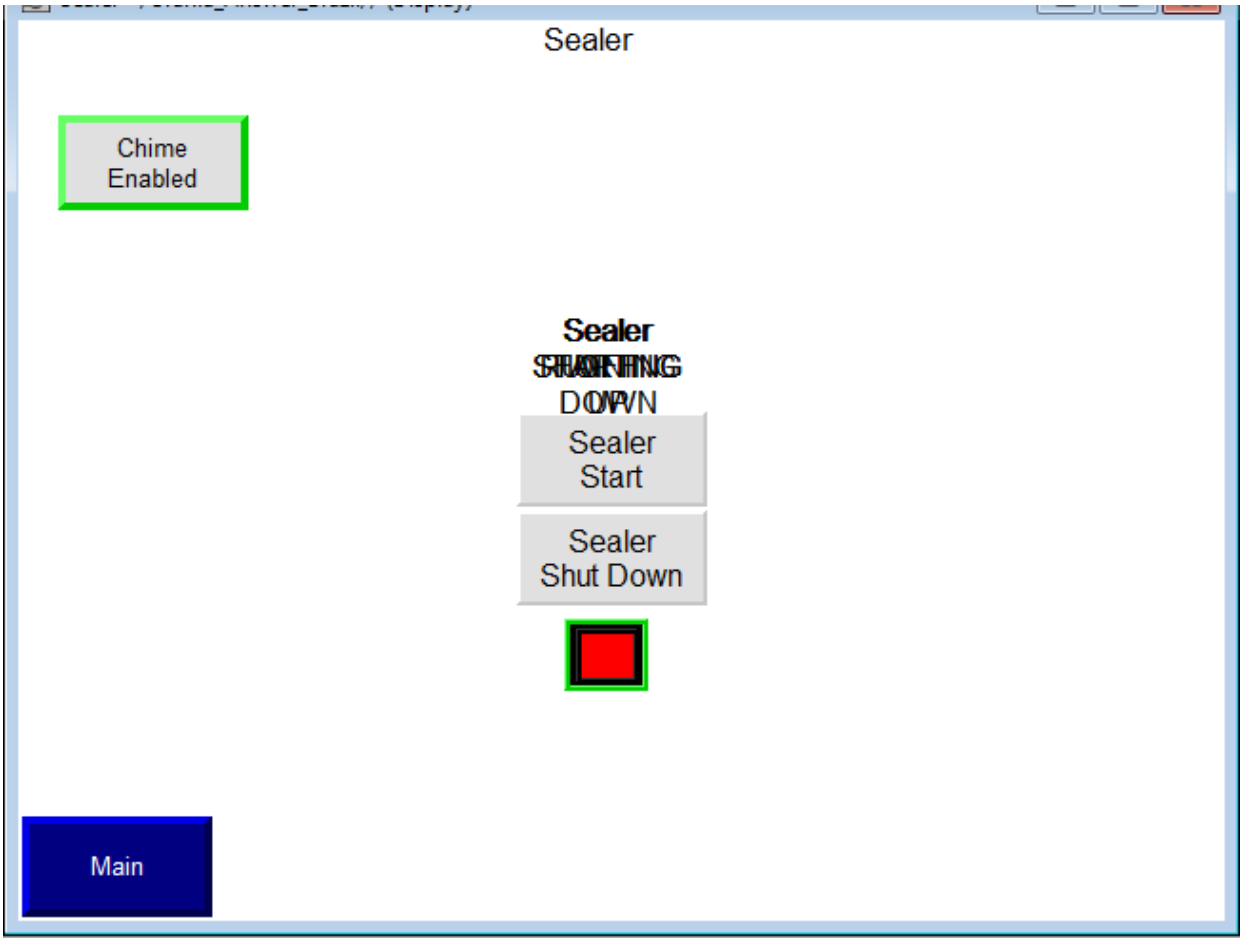
Extend – transport speed from the start position into the load area. This speed will generally be very fast and will not change based on pouch specifications.

Closed Clamp Delay – this feature is used to delay the move from when a loaded pouch is grabbed and taken to the drop point over the conveyor. It creates a minimum seal time before the pouch is moved from the load area. Thicker materials and heavier loads tend to require more time to allow the seal to form before they can be moved.

Min Seal Time – controls the total amount of time that the loaded pouch is held in the seal bar. It is the Clamp Closed Time added to the time the pouch is transported above the conveyor and held before being dropped. Thicker materials and heavier loads tend to require more seal time.

Manual Forward / Reverse – these buttons will move the current operation considerably more than the nudge buttons (when the Manual display is illuminated).

Main – takes the operator back to the main menu of the system.



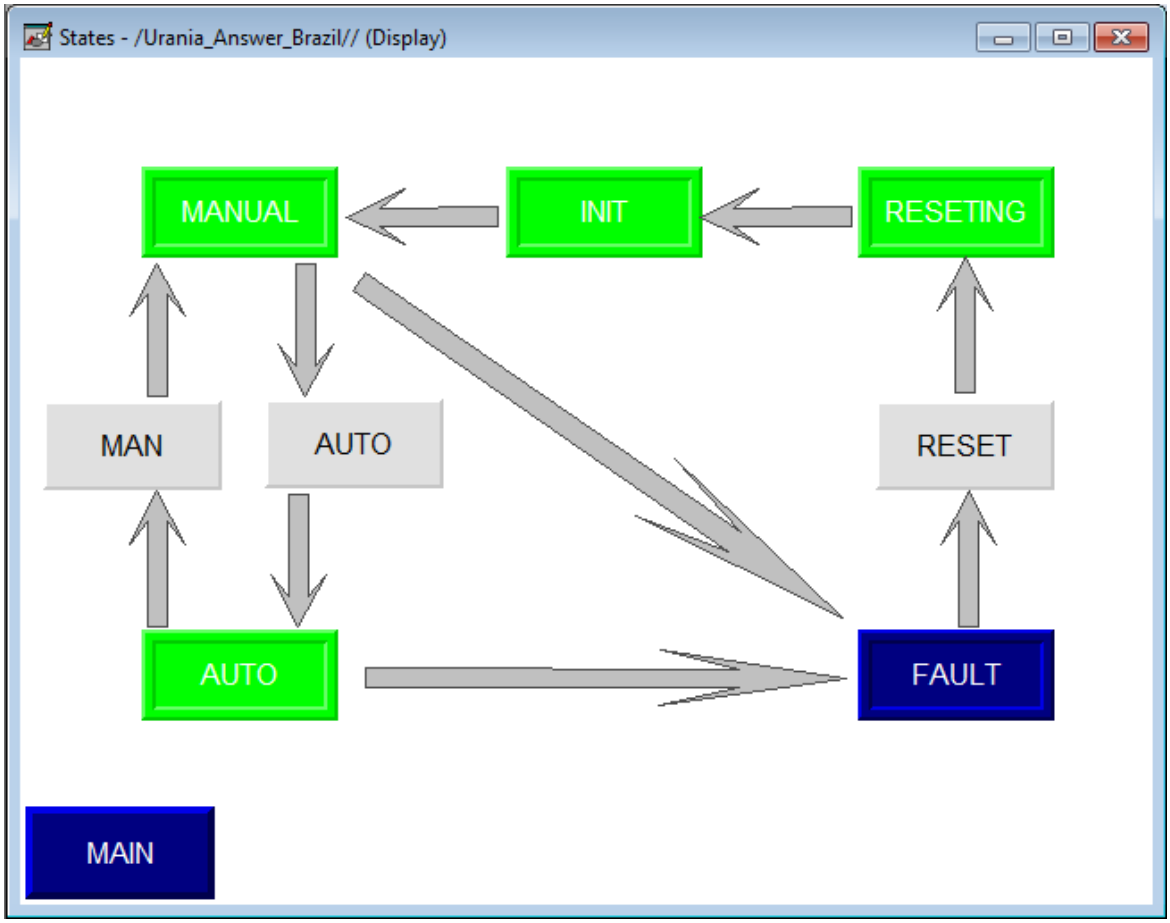
The sealer screen is used to control the heat sealer and to enable / disable the audible chime of the system.

Sealer Start / Shut Down – used to turn the heat sealer off and on. The current status is shown directly above the control buttons.

Sealer Speed – used to control the sealing speed during operation. This speed works in conjunction with sealing temperature and is specific to pouch material and other factors. Generally, a higher speed will require higher temperatures to seal properly. The instant measured speed is displayed below.

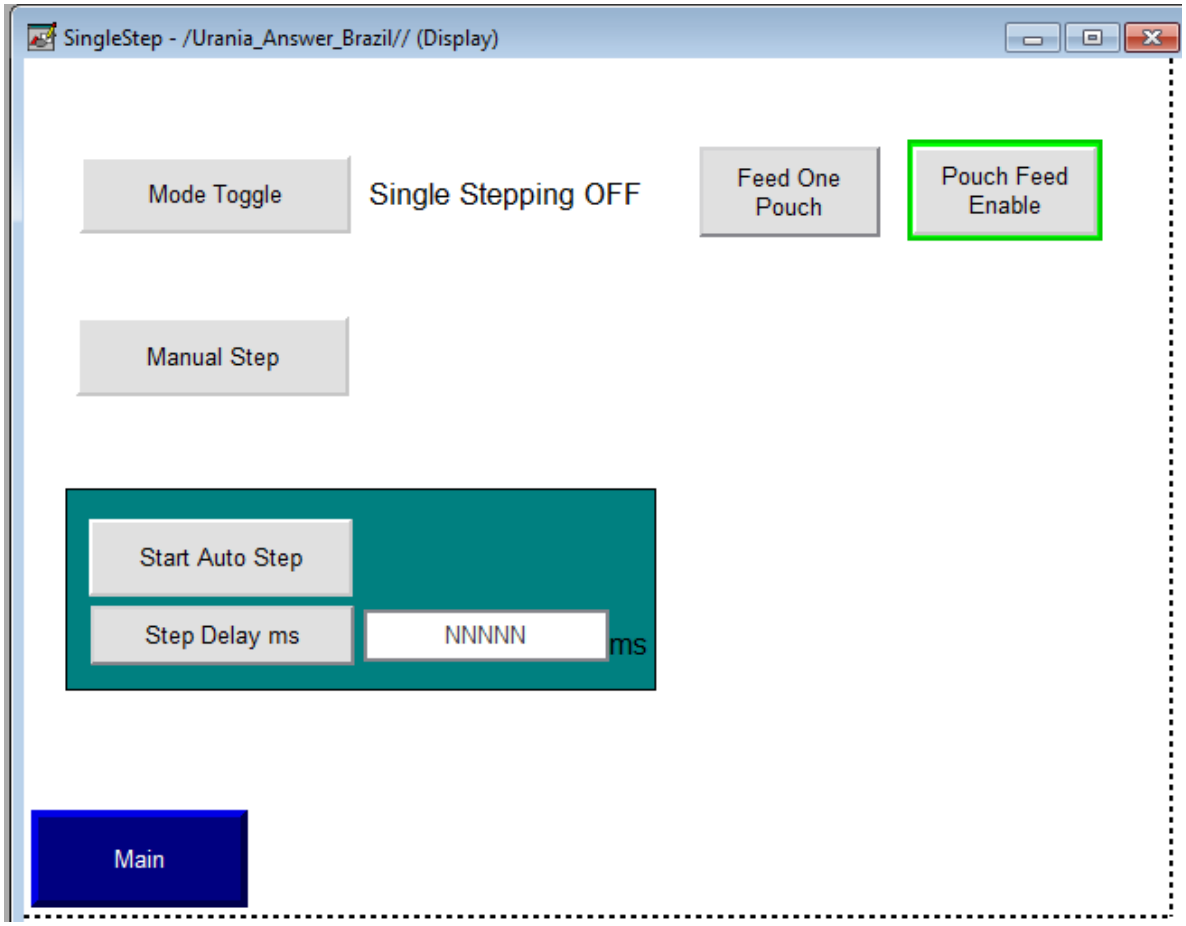
Chime Enabled – turns the audible chime of the system on or off

Main – takes the operator back to the main menu of the system.



The states screen is used to show the current system status and can be used as a general guide for troubleshooting. Each state button will be illuminated to show a particular condition or cycle. This screen is not used to change states of the machine, only to identify them.

Main – takes the operator back to the main menu of the system.



The single step screen is used to toggle the system between normal operation and a single step condition. The single step mode of operation is useful during setup and troubleshooting. The operator can cycle the machine one step of operation at a time through the entire process.

The single step mode can also cycle through the process automatically with a user defined delay after each step. This allows troubleshooting without having to press any buttons to create the cycle.

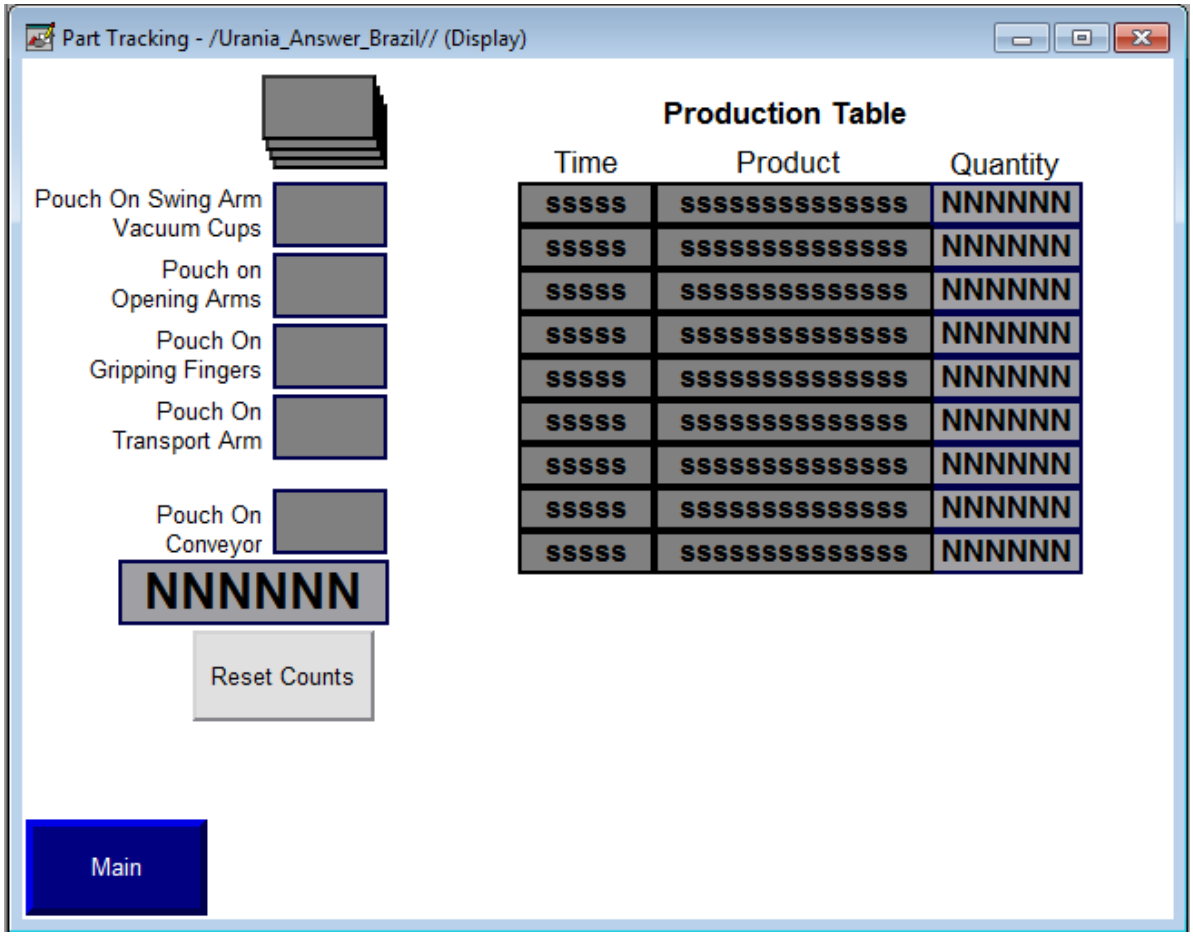
Manual Step – used in single step mode to cycle through each individual step of the process manually. Each time the button is pressed, one step is recreated.

Start Auto Step – used to create an automatic single step mode. The system will cycle through the entire process, but pause after each step. It can be used as a slow-motion cycle for troubleshooting. No button actions are required for the cycle to continue its steps.

Step Delay – sets the delay time between steps during the auto step process. Touching the button will open a keypad for numeric entry of a new delay.

Feed One / Feed Enable – toggles between feeding only one pouch through each step of the operation or allowing continuous pouches to be stepped through the cycle.

Main – takes the operator back to the main menu of the system.

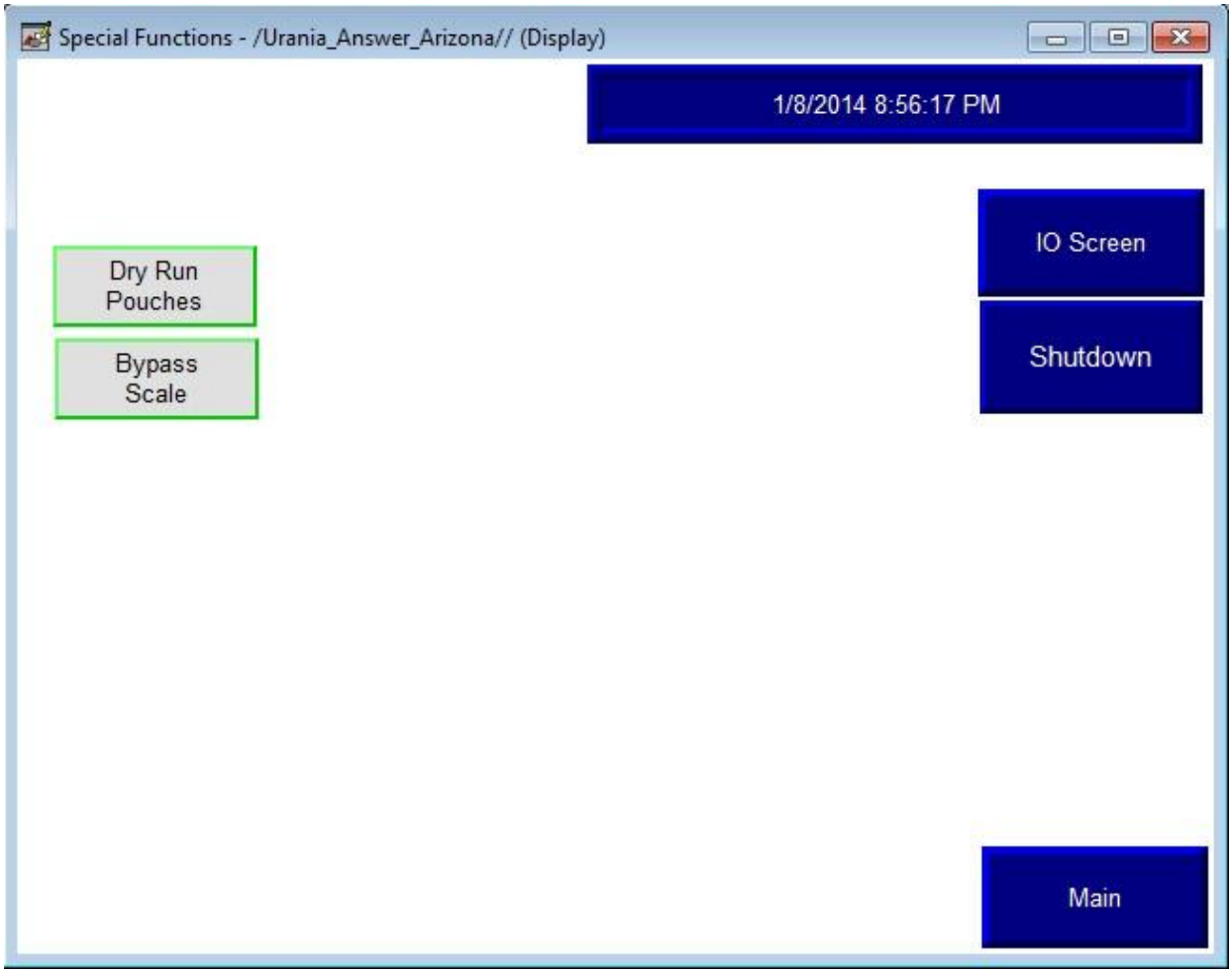


The part tracking screen is used as a history of the process. Every pouch processed through the system is logged here. Individual recipes are also tracked for production data and a timestamp for each. It can also be used to identify where a pattern of failures occurs for troubleshooting by noting variances in the counters of each step of the cycle.

All values can be reset at any time to create a new tracking start point.

Reset Counts – used to reset the good and bad counts of the system during a specific time period.

Main – takes the operator back to the main menu of the system.



The special function screen is used during troubleshooting to run pouches without product during setup or troubleshooting.

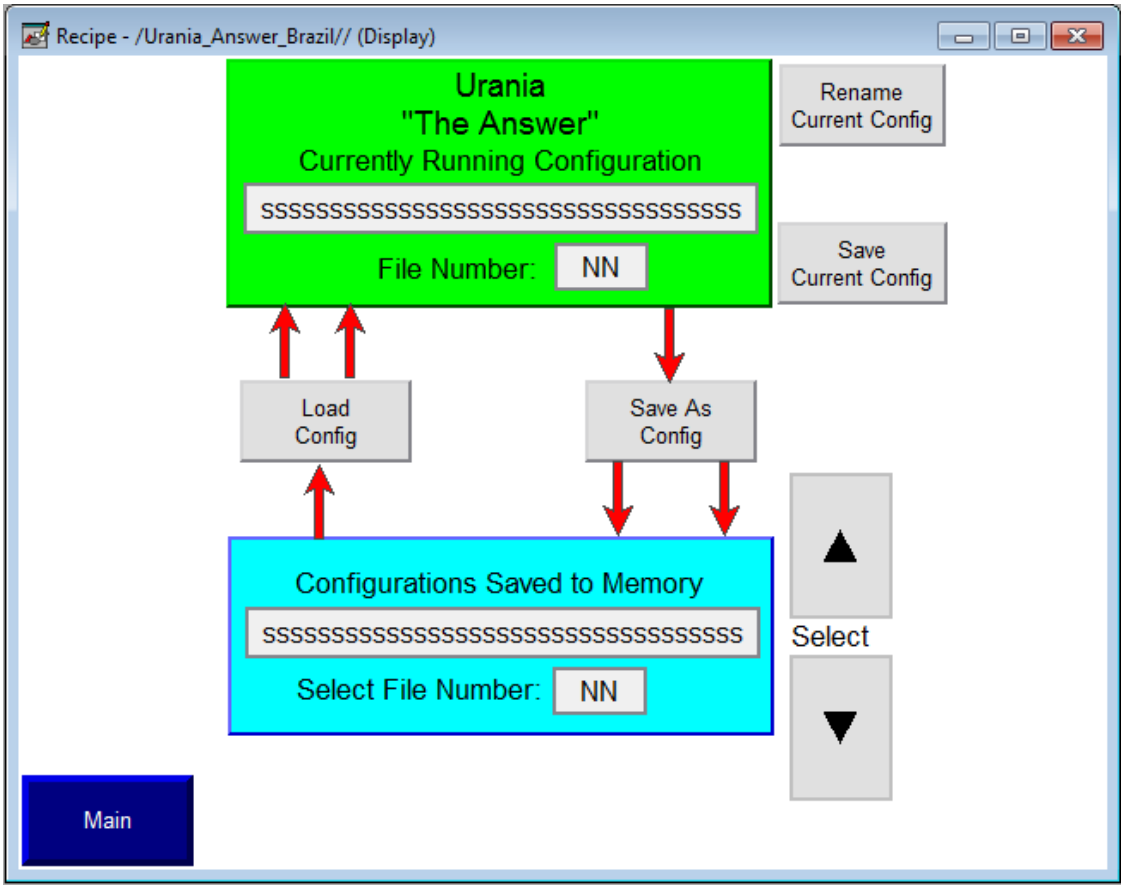
Dry Run Pouches – enables running of the machine without input from the scale or weighing device. The load gate will not be active and no product will be necessary for cycle completion.

Bypass Scale – enables running of the machine without input from the scale or weighing device. The load gate will be active, so product can be manually run through the system. This feature is useful in troubleshooting, setup, or manual product loading. Controlling the time for gate open duration (on the gate screen) allows the operator to manually load product at a defined cycle rate.

I/O – takes the operator to the I/O configuration screen.

Main – takes the operator back to the main menu of the system.

Shutdown – puts the system into its automatic shutdown mode.



The recipe screen is used as a storage location for any number of machine setups and pouch configurations. Every variable from the operator control screens can be changed and stored here as a new configuration.

The recipe screen is very useful when a system runs different pouches and/or products, or needs to process the same pouch at different speeds or settings. The operator names and stores each individual set of parameters in a configuration. These configurations can be selected quickly and easily as the system needs to change its operation.

Rename Current – used to name the current configuration of parameters. When pressed a popup menu will appear to allow the operator to rename the set of parameters.

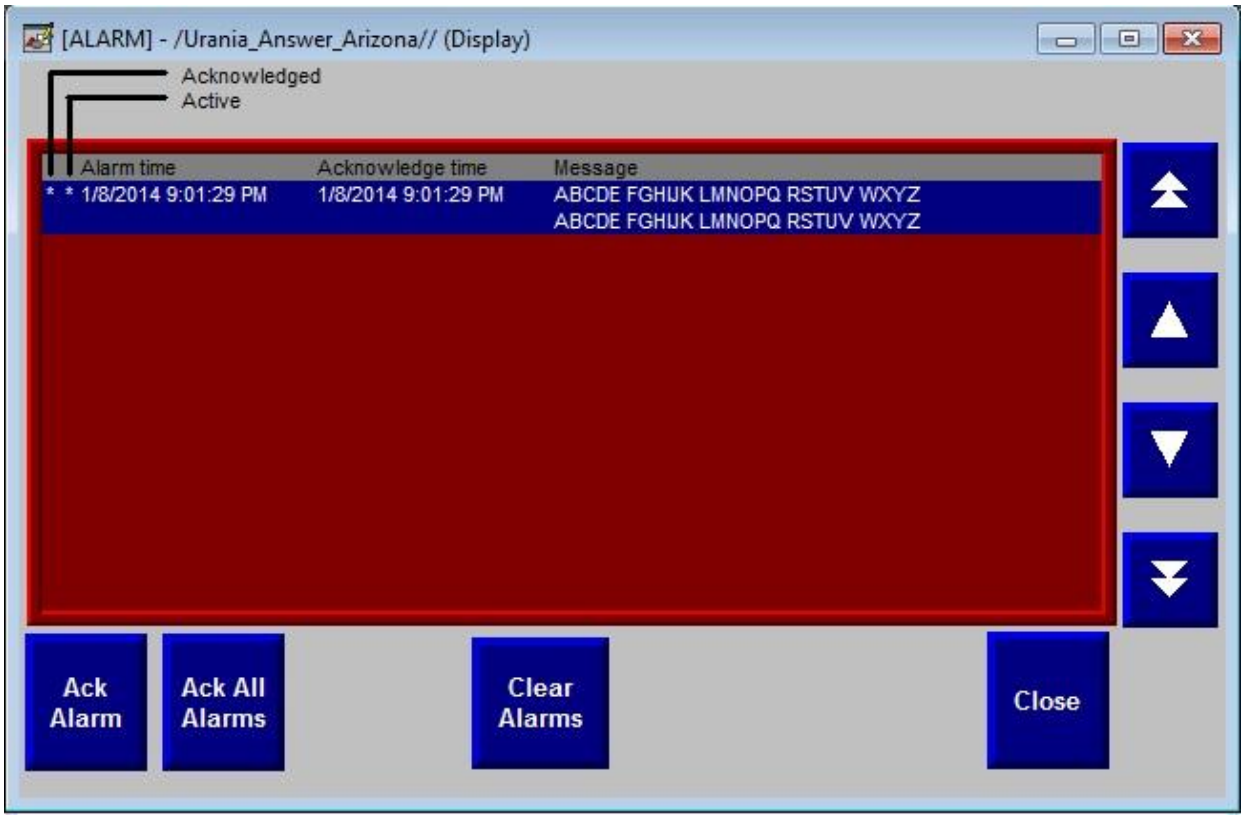
Save Current – used to save the name and parameters of the current configuration

Save As Config – saves the currently selected configuration to a select memory number displayed on the lower half of the screen. Whatever configuration number is selected in the blue area will be overwritten by the current configuration in the green area.

Load Config – loads a new configuration from memory (blue area) into operation (green area)

Select – used to scroll through stored configuration numbers for selection or to change the current stored number for saving from the green area.

Main – takes the operator back to the main menu of the system



The alarm screen displays all errors that the machine encounters during operation. It will both display the error upon occurrence and log it into memory for future evaluation. A date and time stamp is included for both the occurrence and acknowledgment of all errors.

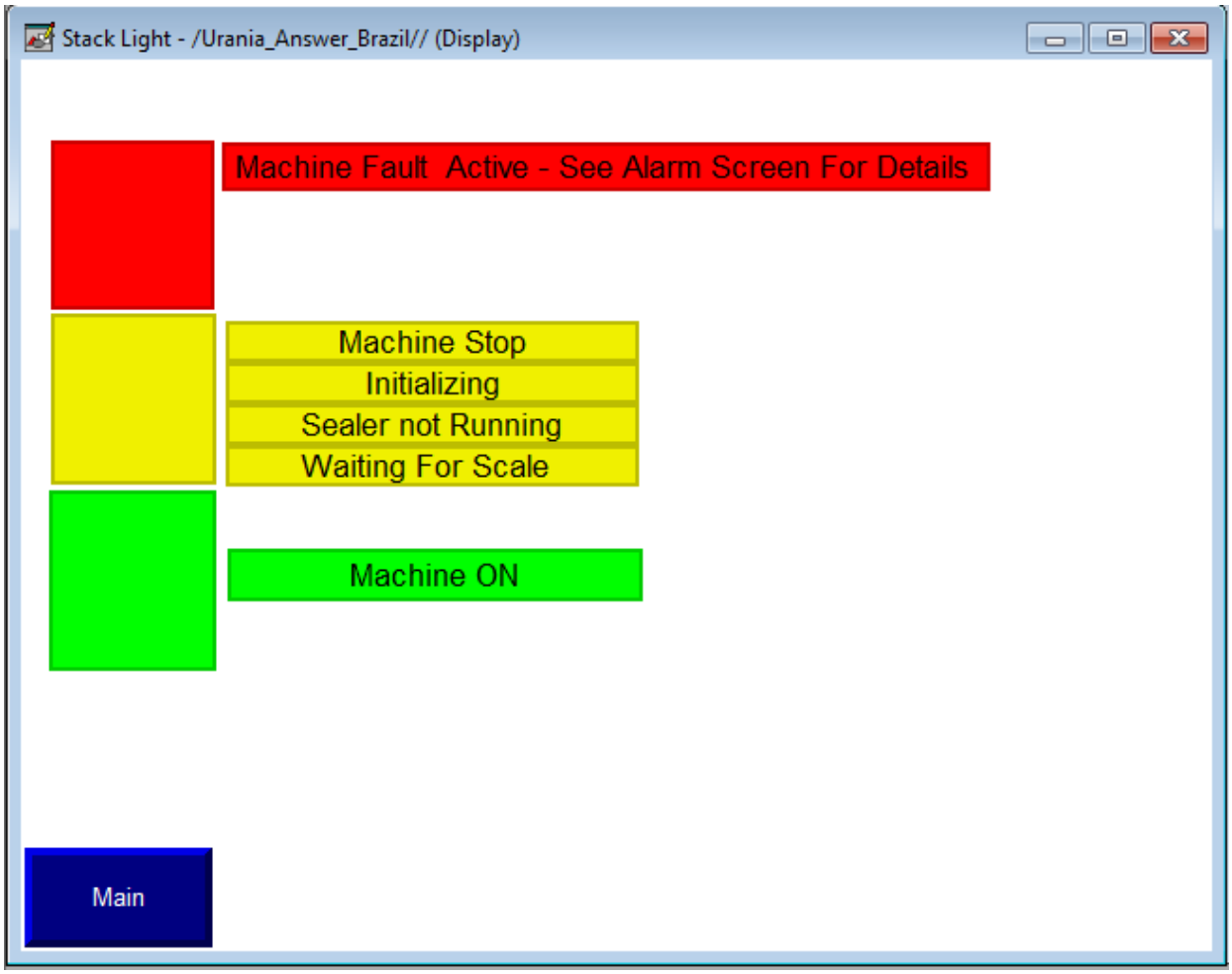
Ack Alarm – tells the system that the operator has acknowledged the latest alarm and it can now be reset for continued operation.

Ack All Alarms – tells the system that the operator has acknowledged all alarms and it can now be reset for continued operation.

Clear Alarms – clears all the alarm history from memory

Close – closes the alarm screen and takes the operator back to the main operating screen

Blue Navigation Arrows – allows the operator to scroll through the alarm history either one line or one page at a time.

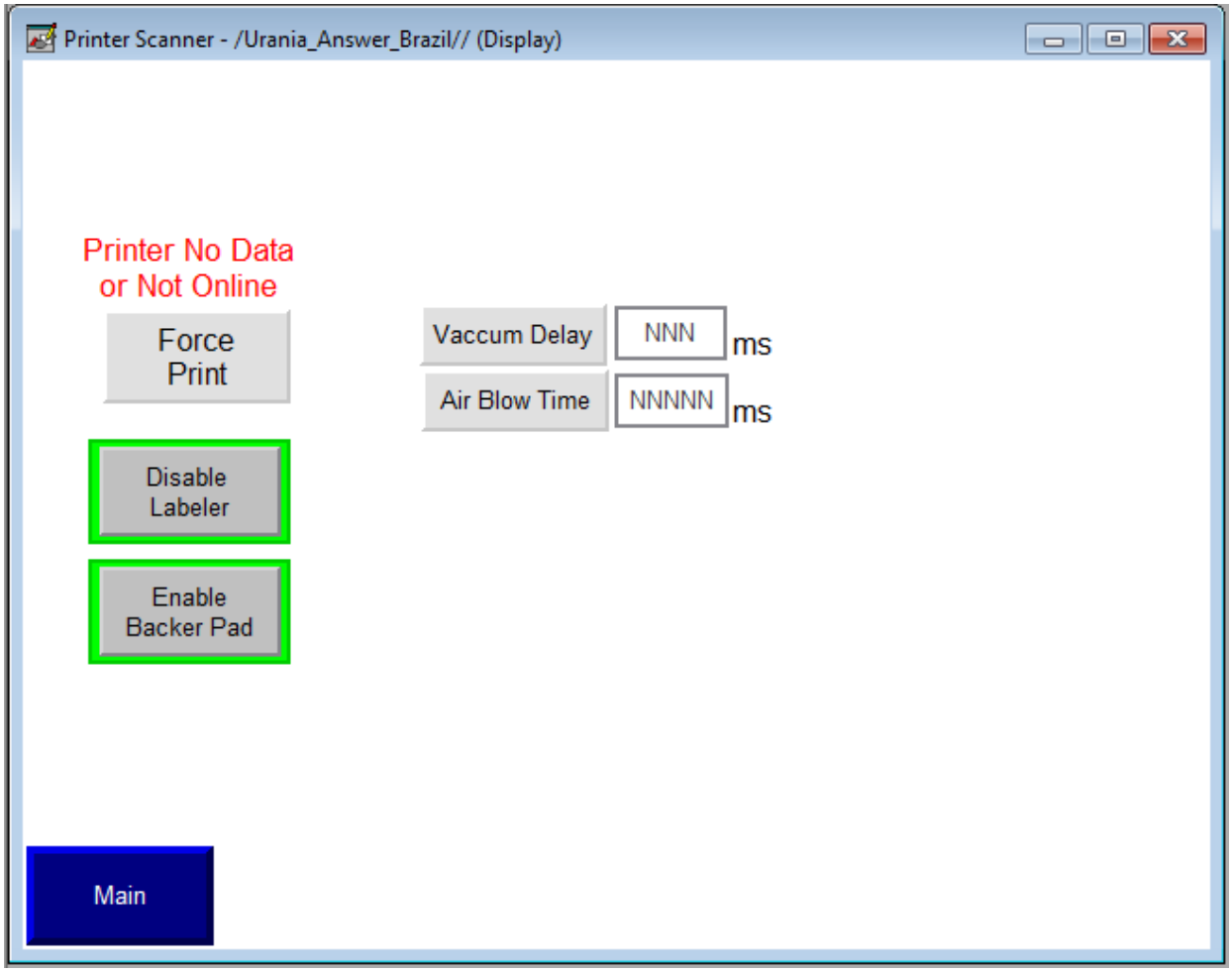


The stack light screen is used as a guide for the operation and display parameters of the three (3) color stack light. Each color is defined by what type of system status triggers the specific light. The current status is also displayed and explained.

Each of the three (3) colors is used as a quick reference to notify the operator of the system's operational parameters. An operator can notice a repeated stack light notification from a distance and address any problems.

The stack light notification sequence is also shown as a graphic on the main screen during operation.

Main – takes the operator back to the main menu of the system.



The (OPTIONAL) printer screen is used to manually control the vacuum delay of the labeler's tamp pad as well as the air assist blow time.

The vacuum delay is the time the tamp pad waits to turn on vacuum after the label feed sequence is initiated during the cycle. Different size labels require different delays to ensure proper feeding to the tamp pad. Once this time is established, it should be maintained unless label properties or size changes. Should there be feeding issues, this value can be used to help correct them.

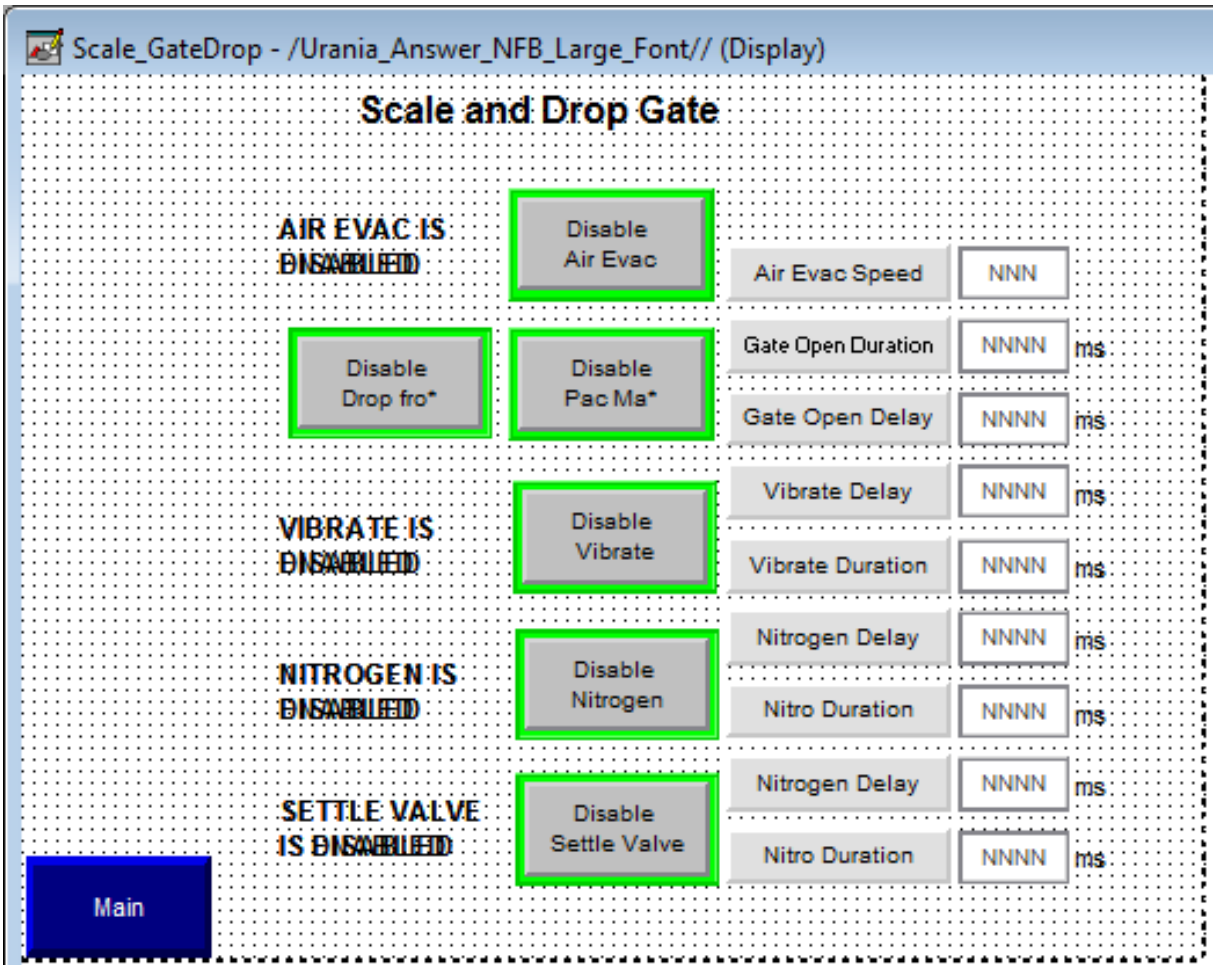
Force Print – will force the printing and feeding of a label if there is any data in the printer cue (printer no data is not displayed). This button is useful to manually purge the barcode reading and printing cue.

Vacuum Delay – delay in milliseconds

Air Blow Time – blow time in milliseconds

Disable / Enable – turns on or off the labeler and backer pad below the tamp assembly. The backer pad is not usually required on small pouches.

Main – takes the operator back to the main menu of the system.



The (OPTIONAL) Scale and Drop Gate screen is used to set the delays and durations of the Air Evacuation device, the Load Gate, the Vibration System for product settling, the Nitrogen gas injection, and the Product Settling Tamp (located under the pouch).

Air Evac Enabled – controls the operation of the air evacuation system. This feature adds a step to the cycle in which air is forced out of the pouch before sealing occurs. It has been deemed useful when a very small amount of product is loaded into a pouch and thus allows air to be trapped inside during sealing. This air pocket can cause issues during casing and boxing. The speed controls how fast the opening arms will come together to remove the air. The positions of the motion are controlled by the opening arms during the pouch opening process before loading.

Product Gate – the product gate is located above the opened pouch and acts as staging device for product from the customer's weigher or filler. The gate dives into the open pouch and opens for a set time to allow all product to flow into the pouch. The Open Duration controls the amount of time the gate is open to allow product flow. The Open Delay controls the amount of time the gate waits to open from its initial dive into the pouch. Depending on nitrogen requirements and product flow, this time is used to fine tune the cycle rate.

Drop from scale changes the sequence of the drop gate device. Under normal operation, the gate will remain in its home position until product is received from the scale. Once the scale sends its complete signal, and a pouch is opened for loading, the gate will dive into the pouch and release the product. When Drop From Scale is enabled, the gate will enter an opened pouch, then send the signal to the scale to send product. The end result is that product will be dropped directly from the scale to the open pouch and not into the gate first. This can help process troublesome products that tend to stick or bind inside the gate. Care must be taken to allow for enough time of Gate Open Duration, so that the scale can complete its cycle before the gate is removed from the pouch.

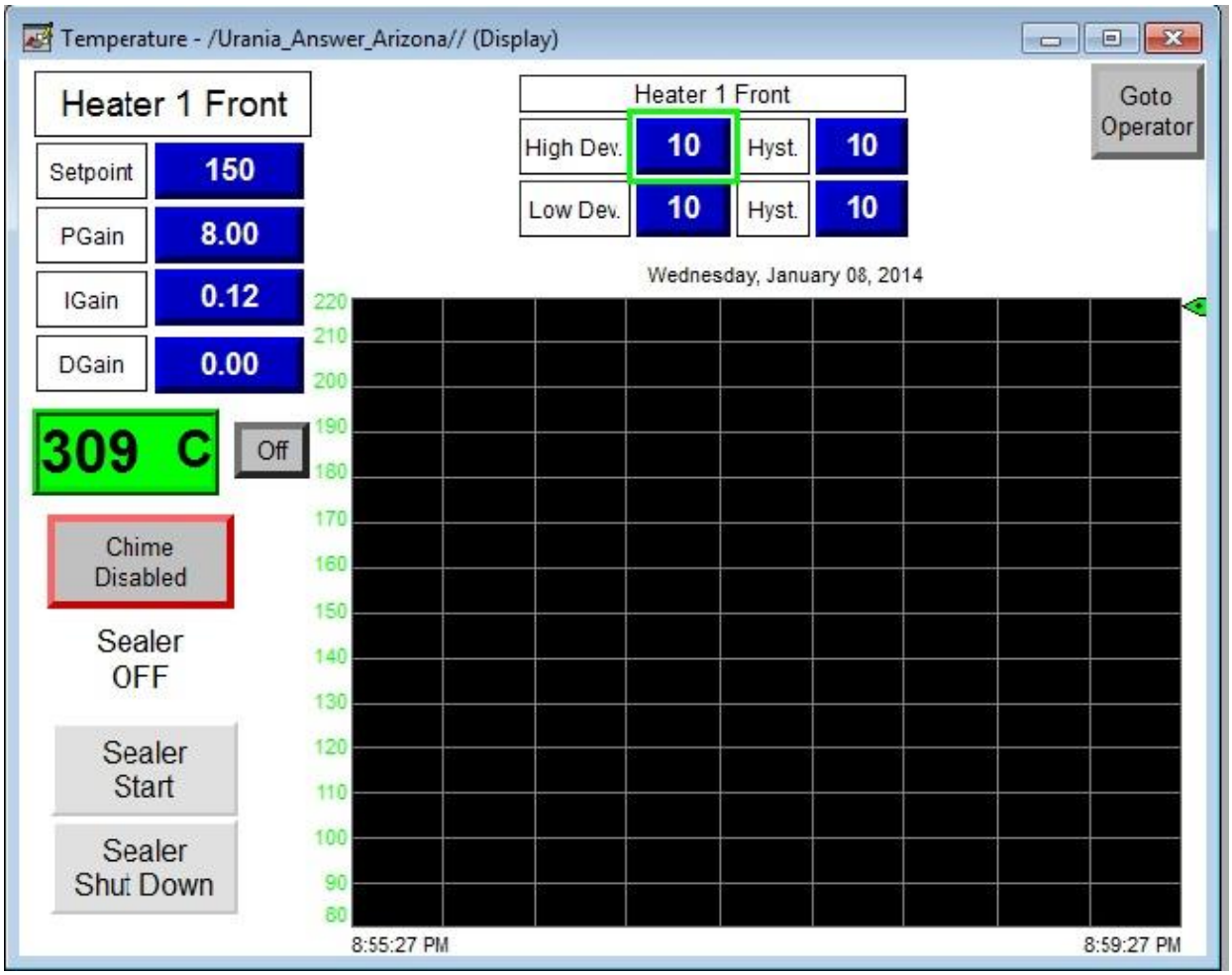
The Pac Man function of the gate creates a pulsing during product delivery to the open pouch. The pulsing can help to break up sticky or awkward products inside the gate. The amount of Gate Open Duration will dictate how many pulses the gate does inside the open pouch.

Vibrate Device – the vibration device produces pulses during the gate opening sequence to help product flow through the load gate and settle inside the pouch. The delay controls how long the vibration waits from the time the gate begins its dive into the pouch and the duration is the amount of time the vibration lasts from when it turns on. The amplitude of the vibration is controlled via a flow control on each vibration cylinder and are set independently. The delay and duration are common to both cylinders.

Nitrogen System – controls the injection of nitrogen into the open pouch before and during loading. The delay is the time the nitrogen waits to flow from the initial dive of the product gate. The duration is the amount of time the nitrogen flows from that point. The nitrogen pressure is controlled via a regulator located next to the product gate. Nitrogen flow can be quite useful in helping to form the bag before product is loaded.

Settle Valve – controls the product settling device located under the pouch in the load area. This device gives the product a series of pulses during the loading process and will help settle large loads. Works in conjunction with the vibration devices to maximize capacity and minimize load time. The delay is the time the cylinder waits to start from the time the gate begins to dive and the duration is the total time the vibration occurs.

Main – takes the operator back to the main menu of the system.



The Sealer Temperature screen is used to display and control the sealing parameters of the system. Most of these settings are determined prior to shipment and should never be changed unless a problem occurs. It is also recommended that the user contacts our facility before making any changes other than the setpoint, chime settings, or deviations.

Setpoint – controls the operating temperature of the sealing bar. It is shown in degrees C and pressing the blue button will open a popup that allows the operator to enter a new value.

PGain – controls the positive gain of the sealing temperature. The proportional gain is a derivative based on present error in the system and is used to give a general adjustment to the temperature. The adjustment will move the system in the proper direction but will require an integral gain to fine tune it. This value should only be adjusted by qualified personnel.

IGain – controls the interval gain of the sealing temperature. The integral gain is a fine tuning for the proportional gain and is based on an error history. This control will use a series of past error responses to teach the system how to properly maintain temperature in a smooth and consistent manner. This value should only be adjusted by qualified personnel.

DGain – controls the deviation gain of the sealing temperature. The derivative gain is used to dampen spikes in the temperature cycle by predicting future oscillations from past ones. This value should only be adjusted by qualified personnel.

Current Temperature – displays the actual current temperature of the sealing bar.

Chime Enable – turns on or off the audible chime used to tell the operator that the sealing temperature has stabilized and that the system is ready for operation.

Sealer Status – shows the current status of the sealing bar as being on or off

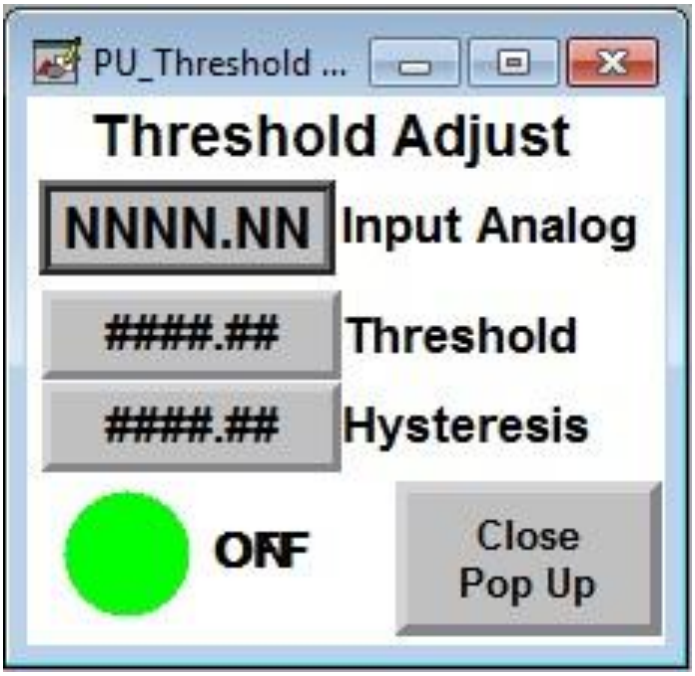
Sealer Start / Shut Down – used to turn the sealer on or off. Current status is shown directly above the buttons.

High Dev – controls the number of degrees C that the temperature can fluctuate above the current setting before an alarm will occur.

Low Dev – controls the number of degrees C that the temperature can fluctuate below the current setting before an alarm will occur.

Hyst – controls the hysteresis of the high and low temperature limits. Hysteresis settings are used to control fluctuations and cycling of the heating system.

Go To Operator – takes the operator back to the main menu of the system.



The Vacuum Threshold adjustment popup is used to control the parameters of the analog to digital sensors located at each vacuum station of the machine.

Input Analog – displays the currently selected senor by its input number on the PLC

Threshold – displays the setting that the vacuum senor will produce an error (in of Hg). A common setting for this threshold is between 14 and 16 in of Hg.

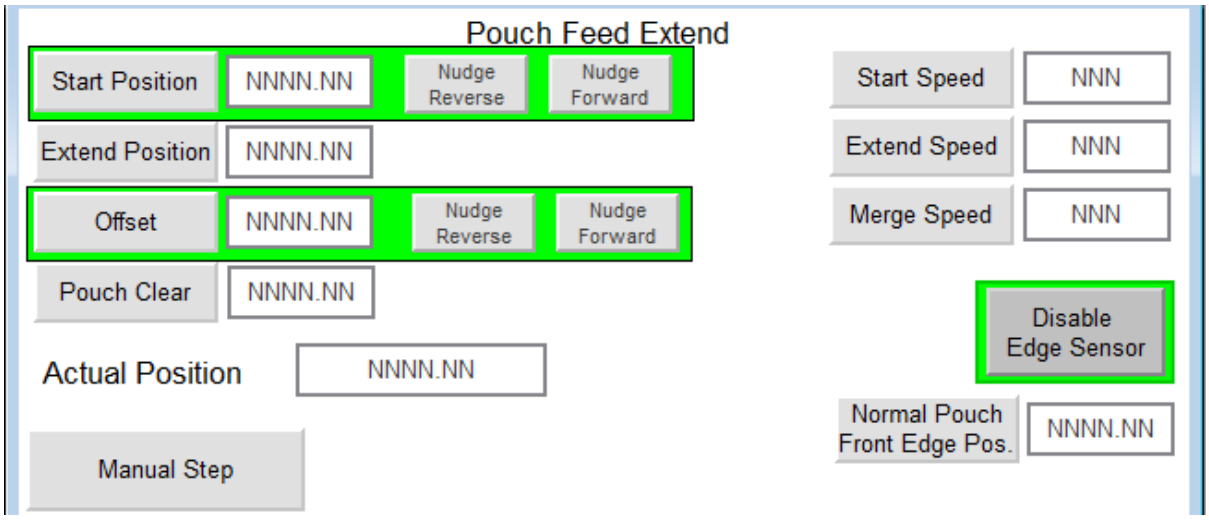
Hysteresis – controls the hysteresis of the vacuum threshold. Hysteresis settings are used to control fluctuations and cycling of the vacuum system.

Close Pop Up – closes the popup menu and takes the operator back to the main screen.

2.0.5 EDGE SENSOR OPERATION

The edge sensor located to the right of the magazine is responsible for detecting and aligning both the leading and top edges of the pouch. The sensor is used for processing pouches that are difficult to load in the magazine or have characteristics that make them unique to handle (such as zipper closures or bottom gussets).

The edge sensor can be turned on and off through the "Pouch Feed Extend" menu from the main screen of the HMI using the "Disable / Enable Edge Sensor" button.

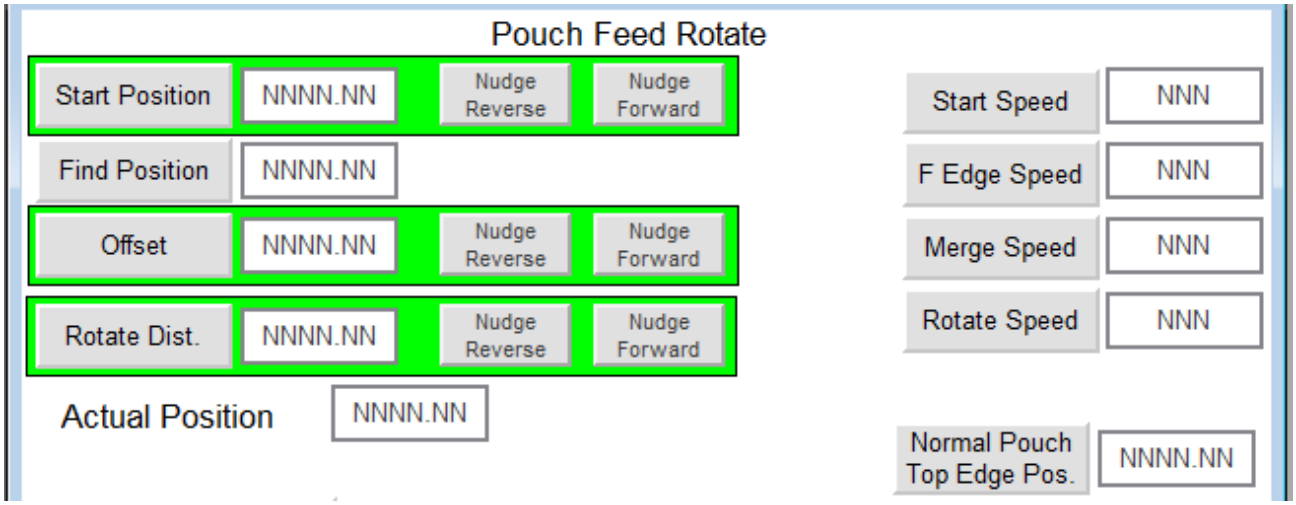


Offset – linear position of the pouch feed arm after the side edge correction is achieved. When using the edge sensor, this value will determine where the arm stops before rotating down to the load area. Use this value to ensure the pouch is centered on the gripper arms in the load area (after being rotated down). This value will replace the "Extend Position" while using the edge sensor.

Pouch Clear – this value tells the pouch feed arm when the pouch is clear of the magazine during removal. It is used during the top edge correction to ensure that the pouch is not still in the magazine stack and can be rotated to find the top edge. This value should be set once and maintained under normal operation. This value can be useful when a pouch has a hang hole located in the center. Since the edge sensor could possibly see the hang hole, the Pouch Clear distance should be so that the edge sensor will not activate until the hole has passed by the sensor beam. Moving the pouch manually until the sensor beam is past the hole and taking note of the "Actual Position" will help the operator determine a value for the "Pouch Clear" position.

Extend Speed – with the edge sensor enabled, this is the linear operating speed of the pouch feed arm from the magazine through the edge sensor. When using the edge sensor, this speed should be conservative to ensure the sensor has ample time to locate the top edge and calculate its position. This speed can be increased when there are no hang holes and on wider pouches, as the edge sensor has more linear pouch area to perform its correction. A good starting point for this speed is about 30%.

Merge Speed – linear speed of the pouch feed arm after the edge detection process and to the rotate down position. Works in conjunction with the extend speed to get the pouch from the magazine to the rotate position. This speed is normally set to match the "Extend Speed", but can be increased if affecting the cycle rate of the machine. This value is not used when the edge sensor is turned off.



Find – this sets the limit of rotation for finding the top edge of the pouch by the edge sensor. This value works in conjunction with other parameters of the edge sensing system and once established, should not be changed.

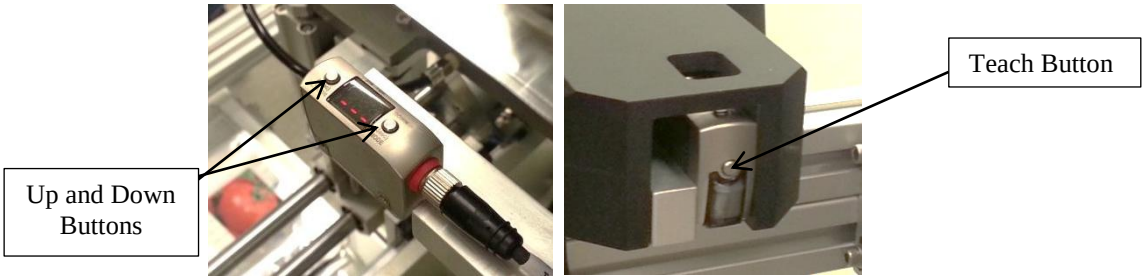
Offset – rotational position of the pouch feed arm after edge correction is done to the top of the pouch. This value works in conjunction with other parameters of the edge sensing system and once established, should not be changed.

F Edge Speed – rotational speed during the top edge detection process. This speed works in conjunction with the "Extend Speed" to ensure the top edge is found before the pouch leaves the edge sensor beam. Both speeds can be increased together to improve the cycle rate of the system. However, care should be taken to ensure that the edge detection process is not too violent or the servo motors can reach their stall torque. A good starting point for this speed is about 10%.

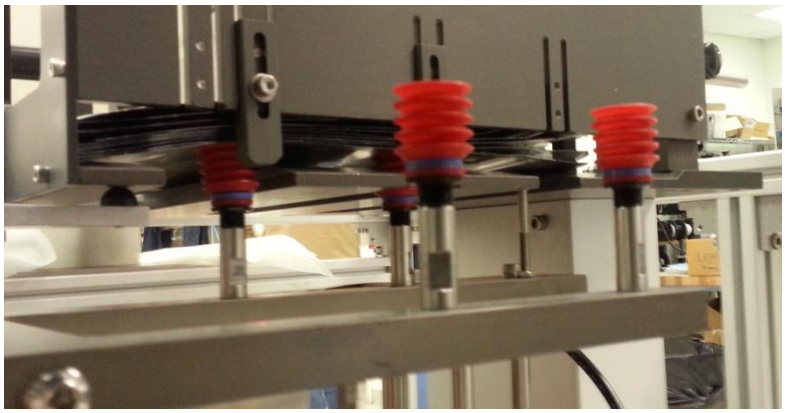
Merge Speed – rotational speed of the pouch feed arm after the top edge has been detected. This occurs after the edge sensor to the rotation point to the load area. Normally, this speed can be very conservative because the feed arm is traveling a considerable linear distance and rotating a small amount. A good starting point for this speed is about 5%.

TEACHING THE EDGE SENSOR

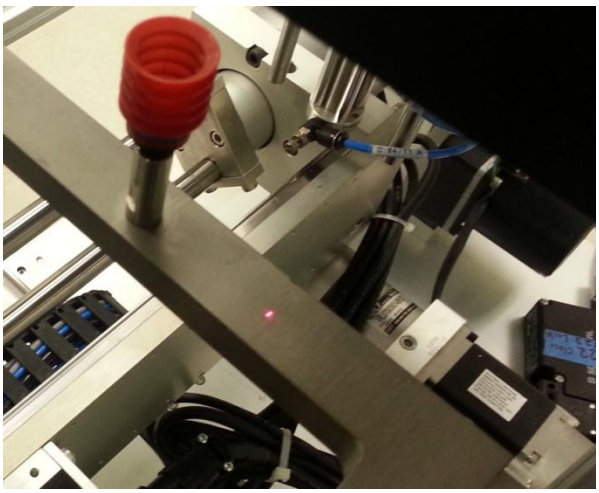
1. Turn on the power switch to the system. It is not necessary to reset the HMI or lock the doors (activating the vacuum pump).
2. Remove the cover located above the edge sensor.



3. Manually position the pouch feed arm so that it is in the pull out position from the magazine. There are 2 cylinders that control the extension of the feed arm into the magazine. One is a 2" stroke and the other is a 1" stroke. The proper extension for teaching the sensor is the 2" extended and the 1" retracted as shown below.



4. Move the feed arm horizontally so that it is level and the side of the arm is located within the edge sensor's beam as shown below. Please make sure that the 2" cylinder is extended and the 1" cylinder is retracted.



5. Press and hold the teach button located on the front of the edge sensor for approximately 3 seconds and the display will flash “SET”. Once taught, the feed arm plate should give a reading of about 0 when positioned as described above. This creates the proper suppression for sensor with respect to the plate.
6. Next, hold a pouch in approximately the position it will be in as it is pulled from the magazine and note the value displayed on the edge sensor. This value is normally around 60 when a printed pouch is being detected. Clear pouches will give a lower value.
7. Finally, by pressing the up or down buttons on the top of the sensor, the threshold value is displayed and consequently raised or lowered. Using the value found (in step 6) for a pouch being present, adjust the threshold value to approximately 75% of that number. For example, if a pouch produced a value of 60, set the threshold to 45.
8. The sensor is now taught and the protective cover can be reinstalled.

SECTION 3.0
PREVENTATIVE MAINTENANCE

PACKAGING ANSWER PREVENTATIVE MAINTENANCE

This section gives a station by station outline for all preventative maintenance for the packaging system.

STATION A: POUCH MAGAZINE & POUCH FEED ARM

- Inspect the magazine for proper installation and proper height of the pouch retainer fingers.
- Clean the linear shafts of the pouch feed arm with commercial stainless steel spray polish and apply a few drops of 3 in 1 oil for lubrication. Spread the oil evenly over the length of both shafts.
- Replace any damaged red cups on the pouch feed arm vacuum plate and verify no leaks are present.
- Ensure all wires and hoses leading to the pouch feed arm are not binding or rubbing during its motion.
- Clean the two proximity sensors located under the magazine that determine the linear and rotary home positions of the pouch feed arm. Clean the face of all proximity sensors with isopropyl alcohol and a soft towel.
- Clean the three proximity sensors located on the pouch feed arm responsible for determining the position of the vacuum plate.
- Inspect the timing belt used to move the pouch feed arm on the linear shafts.
- Clean the operating face of the edge sensor located between the magazine and labeler.
- Check the pouch feed arm cylinder assembly for binding or excessive play.

STATION B: LABELER & TAMP PAD (OPTIONAL)

- Verify that the labeler is working properly and that the print ribbon is installed.
- Verify the alignment of the labeler tamp pad to the stripper plate and ensure the label air assist tube is clean and in position.
- Verify the alignment of the label backer plate to the tamp pad.
- Clean the proximity sensor on the backer plate assembly.

STATION C: OPENING ARMS & GRIPPERS

- Inspect all vacuum cups and hoses for tears or leaks.
- Inspect both servo drive belts that control the motion of the opening arms and grippers.
- Inspect the rubber gripper tips and replace as necessary.
- Ensure proper orientation of the opening arm vacuum cups. They should be at opposing angles of approximately 90 degrees.
- Remove any product, pouches, or debris that can inhibit the motion of the opening arms and grippers.
- Adjust the four gripper tips so they are all positioned at the same height on the pouch.

STATION D: SEALER & TRANSPORT

- Inspect and replace if necessary the gray rubber strip on the transport clamp device.
- Inspect the brass heating bar and clean with an appropriate cleaner. If debris is on the heating bar, it may be necessary to use a light scotch-brite cloth to polish the surface. ALLOW THE DEVICE TO COOL FROM OPERATING TEMPERATURES.
- Clean the linear shafts of the transport with commercial stainless steel spray polish and apply a few drops of 3 in 1 oil for lubrication. Spread the oil evenly over the length of all four shafts.
- Clean the rubber rollers used as the (optional) zipper closure device with isopropyl alcohol or equivalent.

STATION E: CONVEYOR

- Inspect the conveyor belt for tears or fraying and replace if necessary.
- Clean the conveyor belt with an appropriate solution and dry completely before system operation.

Maintaining the Battery

This chapter explains how to maintain your battery.

Table 32 - Battery Life Estimations

CompactLogix controllers support the 1769-BA battery.

Time On/Off	At 25 °C (77 °F)	At 40 °C (104 °F)	At 60 °C (140 °F)
Always on	14 months	12 months	9 months
On 8 hours per day 5 days per week	18 months	15 months	12 months
On 16 hours per day 5 days per week	26 months	22 months	16 months
Always On	There is almost no drain on the battery when the controller is always on.		

ATTENTION: The 1769-BA battery is the only battery you can use with the CompactLogix controllers. The 1747-BA battery is not compatible with the CompactLogix controllers and may cause problems.

Lithium batteries are primary (not rechargeable) cells that give extended memory support for Rockwell Automation products.

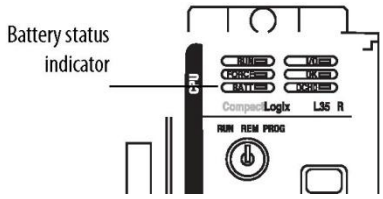
ATTENTION: This product contains a sealed lithium battery that may need to be replaced during the life of the product. At the end of its life, the battery contained in this product should be collected separately from any unsorted municipal waste.

The collection and recycling of batteries helps protect the environment and contributes to the conservation of natural resources as valuable materials are recovered.

Check If the Battery Is Low

The battery indicator (BAT) warns when the battery is low. Once the controller is powered down, the battery retains controller memory as long as the BAT indicator remains on. Temperature dictates how long the BAT indicator remains on.

Figure 24 - Battery Status Indicator



Estimate 1769-BA Battery Life

Table 32 - Battery Life Estimations

Time On/Off	At 25 °C (77 °F)	At 40 °C (104 °F)	At 60 °C (140 °F)
Always on	14 months	12 months	9 months
On 8 hours per day 5 days per week	18 months	15 months	12 months
On 16 hours per day 5 days per week	26 months	22 months	16 months
Always On	There is almost no drain on the battery when the controller is always on.		

ATTENTION: Follow these general rules to store your batteries.

- Store batteries in a cool, dry environment. We recommend 25 °C (77 °F) with 40…60% relative humidity.
- Regularly monitor the temperature and humidity of the storage area.
- Use a first-in/first-out system for handling stored batteries.
- Store in the original containers away from flammable materials.
- Keep track of storage time. Reference storage time to the date of manufacture.
- Do not store batteries longer than 10 years.
- Do not store used batteries longer than 3 months before disposal.
- Clearly mark the contents of the storage area.
- Place a Lith-X or Class D Powder fire extinguisher in a readily accessible area in or around the storage area.
- Ventilate and protect the storage area against fire. You must have a system that automatically detects and extinguishes fires and automatically activates an alarm signal.
- Do not smoke in the storage area.

Store Lithium Batteries

Table 33 - Storage Temperatures for 1769-BA Lithium Batteries

Storage Temperature	Capacity Loss
40 °C (104 °F) for 5 years	Loses up to 4% of original capacity
60 °C (140 °F)	Loses 2.5 % of capacity each year

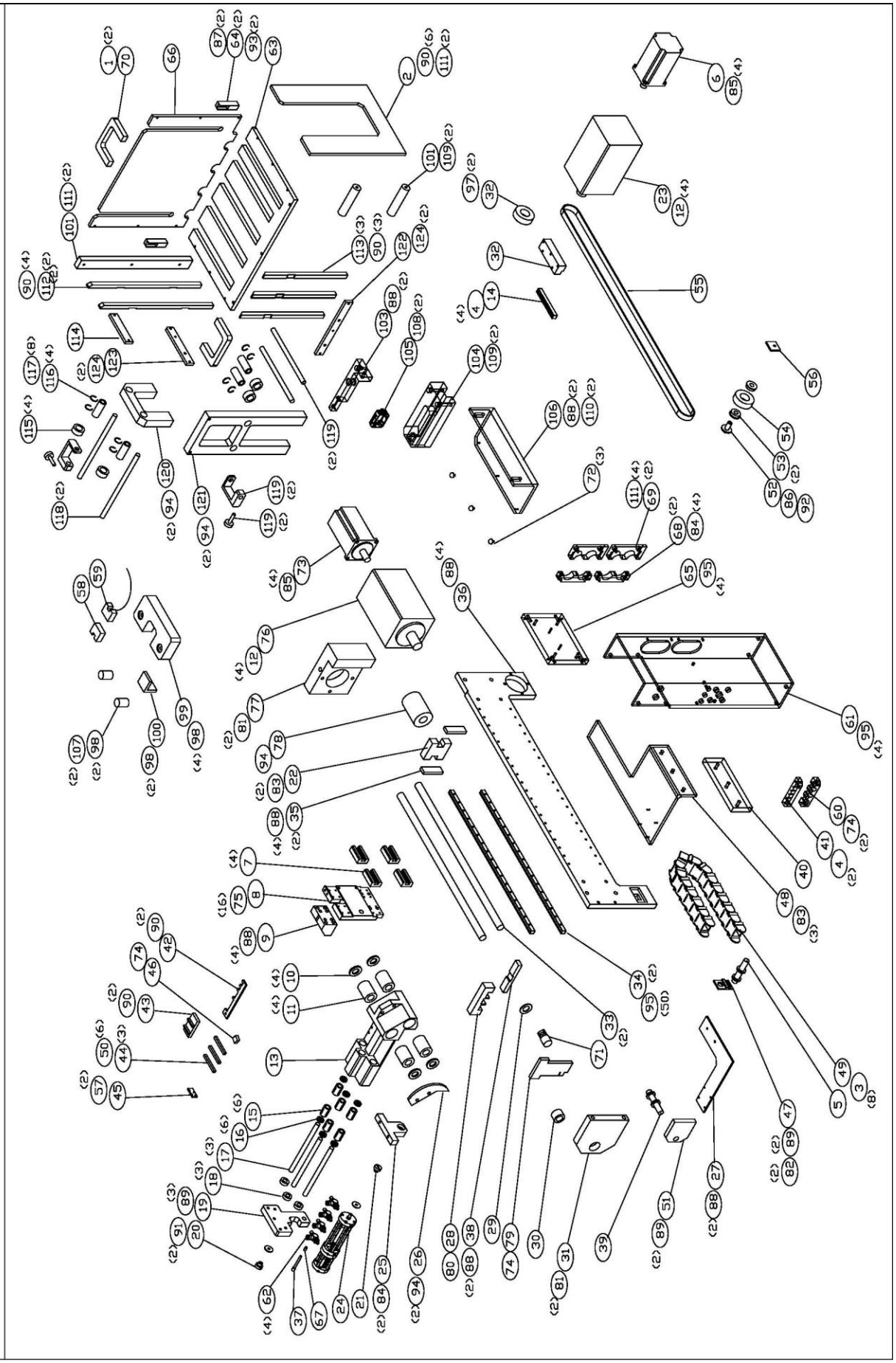
- You may store batteries for up to 30 days between -45...85 °C (-49...185 °F) such as during transportation. Do not store in temperatures above 85° C (185 °F).
- To avoid leakage or other hazards, do not store batteries above 60° C for more than 30 days.
- The rate of capacity loss increases as storage temperature increases.

Battery Removal

WARNING: When you connect or disconnect the battery, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

SECTION 4.0
PARTS LIST

POUCH MAGAZINE AND PICKUP ASSEMBLY

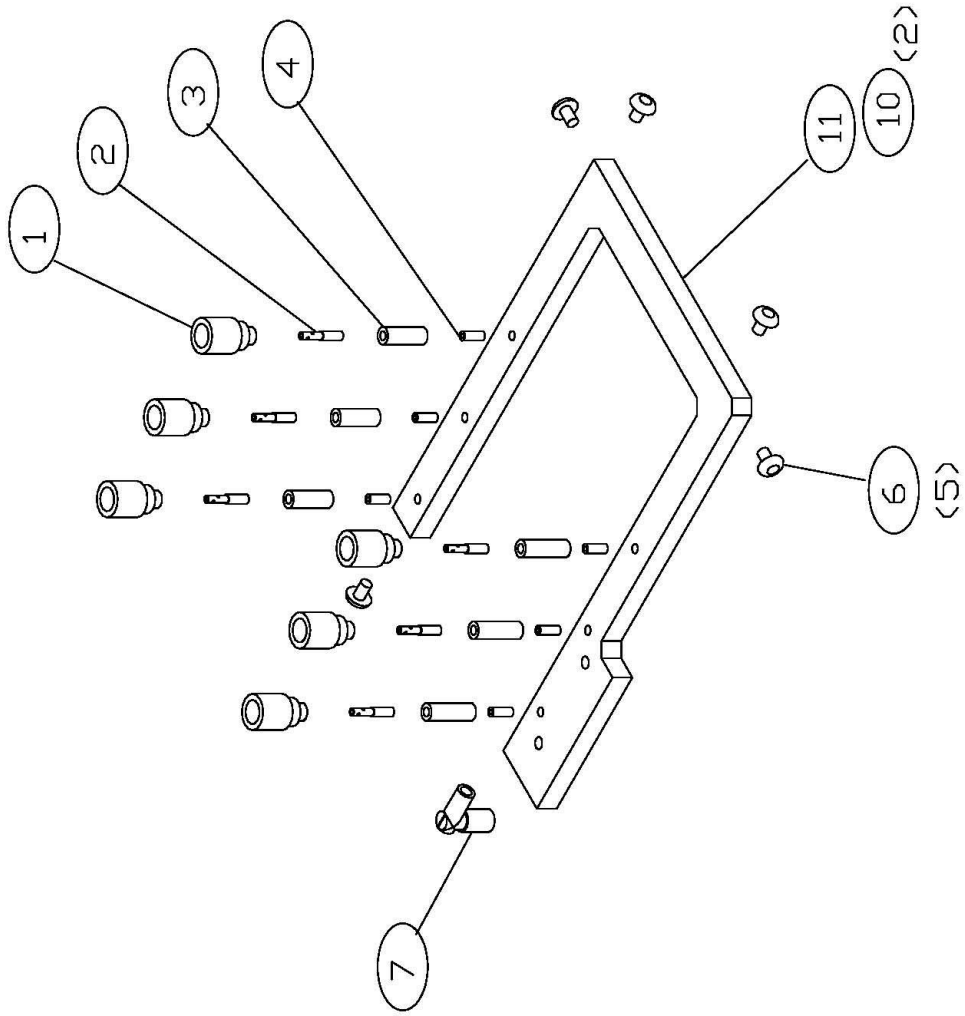


MAGAZINE & PICKUP ASSEMBLY				
Detail #	Series	Urania #	Description	Qty
1	HW	080-00-9707	#10-24 X 3/4 FHMS	4
2	PP	VARIES	MAGAZINE FRONT PLATE	1
3	HW	080-00-0308	#6-32 X 1 1/4 SHCS	8
4	HW	080-00-0403	#8-32 X 1/2 SHCS	6
5	CC	8358-2882	PROXIMITY SENSOR	1
6	CC	000-90-2101	SERVO TRANSFER MOTOR	1
7	CC	8512	THOMSON CARRIAGE	4
8	PP	000-41-1004	LINEAR CARRIAGE PLATE	1
9	PP	000-41-1102	ACTUATOR BLOCK	1
10	CC	000-30-8401	BEARING SEAL	4
11	CC	000-30-8301	LINEAR BALL BEARING	4
12	HW	080-02-7107	M6 X 30 SHCS	8
13	PP	000-41-1303	TRANSFER ARM	1
14	PP	000-41-2103	SERVO BELT CLAMP	1
15	CC	1154	LINEAR BALL BEARING	6
16	CC	551	BEARING SEAL	6
17	PP	000-40-3402	TRANSFER SHAFT	3
18	PP	000-10-1402	RUBBER BUMPER	3
19	PP	000-41-1602	VACUUM PLATE MOUNT	1
20	PP	000-30-0403	ROD END	1
21	PP	000-30-0404	REAR CYLINDER ROD END	1
22	PP	000-41-6703	LINEAR SHAFT CLAMP	1
23	CC	000-90-2001	GEAR REDUCER	1
24	PP	000-41-1702	TRANSFER CYLINDER ASSEMBLY	1
25	PP	000-41-1803	TRANSFER CYLINDER MOUNT	1
26	PP	000-41-1902	TRANSFER ACTUATOR	1
27	PP	000-41-2005	CABLE TROUGH PLATE	1
28	PP	000-41-6704	LINEAR SHAFT CLAMP	1
29	CC	000-30-8701	LINEAR CARRIAGE SPACER	1
30	CC	000-30-8501	NEEDLE BEARING	1
31	PP	000-41-2201	LINEAR CARRIAGE END PLATE	1
32	PP	000-41-2104	SERVO BELT GRIPPER	1
33	PP	000-41-2402	LINEAR CARRIAGE SHAFT	2
34	PP	000-41-6606	LINEAR CARRIAGE RAIL	2
35	PP	000-41-6705	CLAMP PLATE COVER	2
36	PP	000-10-4705	MAIN PLATE	1
37	PP	000-41-6501	CYLINDER CONTROL PIN	1
38	PP	000-41-6706	CLAMP PLATE COVER	1
39	CC	000-50-7001	SHORT PROX	1
40	PP	000-41-2008	CABLE TROUGH SPACER	1

41	PP	000-80-1103	DISCONNECT TOP CLAMP	1
42	PP	000-41-7302	SENSOR FLAG	1
43	PP	000-41-7303	SENSOR MOUNT	1
44	CC	000-50-9701	PROX SENSOR	3
45	PP	000-41-7304	SENSOR MOUNT CAP	1
46	PP	000-41-7305	FLAG MOUNT BLOCK	1
47	PP	000-41-3203	PROX SENSOR MOUNT	1
48	PP	000-41-2009	CABLE TROUGH MOUNT	1
49	CC	000-10-4101	CABLE TROUGH	3 FT
50	HW	080-05-7004	M1.6 X 6 SHCS	6
51	PP	000-41-0906	FLIP SENSOR MOUNT	1
52	PP	000-10-2701	IDLER PIN	1
53	CC	657A	IDLER BEARING	2
54	PP	000-41-7701	IDLER PULLEY	1
55	CC	000-20-3601	SERVO BELT	5 FT
56	PP	000-10-2601	IDLER NUTPLATE	1
57	HW	080-00-0104	#4-40 X 1/2 SHCS	2
58	CC	000-50-0901	MAGNET	1
59	CC	000-50-9301	MAGNETIC SENSOR	1
60	PP	000-80-1104	LOWER WIRE CLAMP	1
61	PP	000-41-7901	MAIN UPRIGHT	1
62	CC	1153	FLOW CONTROL	4
63	PP	VARIES	MAGAZINE BASE	1
64	PP	000-41-4001	MAGAZINE FINGER	3
65	PP	000-41-8101	MAIN PLATE MOUNT	1
66	PP	VARIES	MAGAZINE RIGHT SIDE	1
67	CC	000-31-0201	CYLINDER CONTROL BEARING	1
68	PP	000-80-3601	NARROW SERVO CLAMP	2
69	PP	000-80-3602	WIDE SERVO CLAMP	2
70	CC	000-80-3701	MAGAZINE HANDLE	2
71	PP	000-41-5701	CARRIAGE SWIVEL PIN	1
72	CC	000-30-9301	RUBBER BUMPER	3
73	CC	000-90-2301	SERVO TRANSFER MOTOR	1
74	HW	080-00-0405	#8-32 X 3/4" SHCS	4
75	HW	080-05-2204	M2.5 X 12 SHCS	16
76	CC	000-90-2201	GEAR REDUCER	1
77	PP	000-41-4802	MOTOR MOUNT	1
78	PP	000-40-3603	MOTOR COUPLING	1
79	PP	000-41-1202	HOME SENSOR FLAG	1
80	HW	080-00-0507	#10-24 X 1 1/4 SHCS	1
81	HW	080-00-0704	5/16-18 X 3/4 SHCS	4
82	HW	080-01-8806	#10 FLAT WASHER	2
83	HW	080-00-0607	1/4-20 X 1 SHCS	5

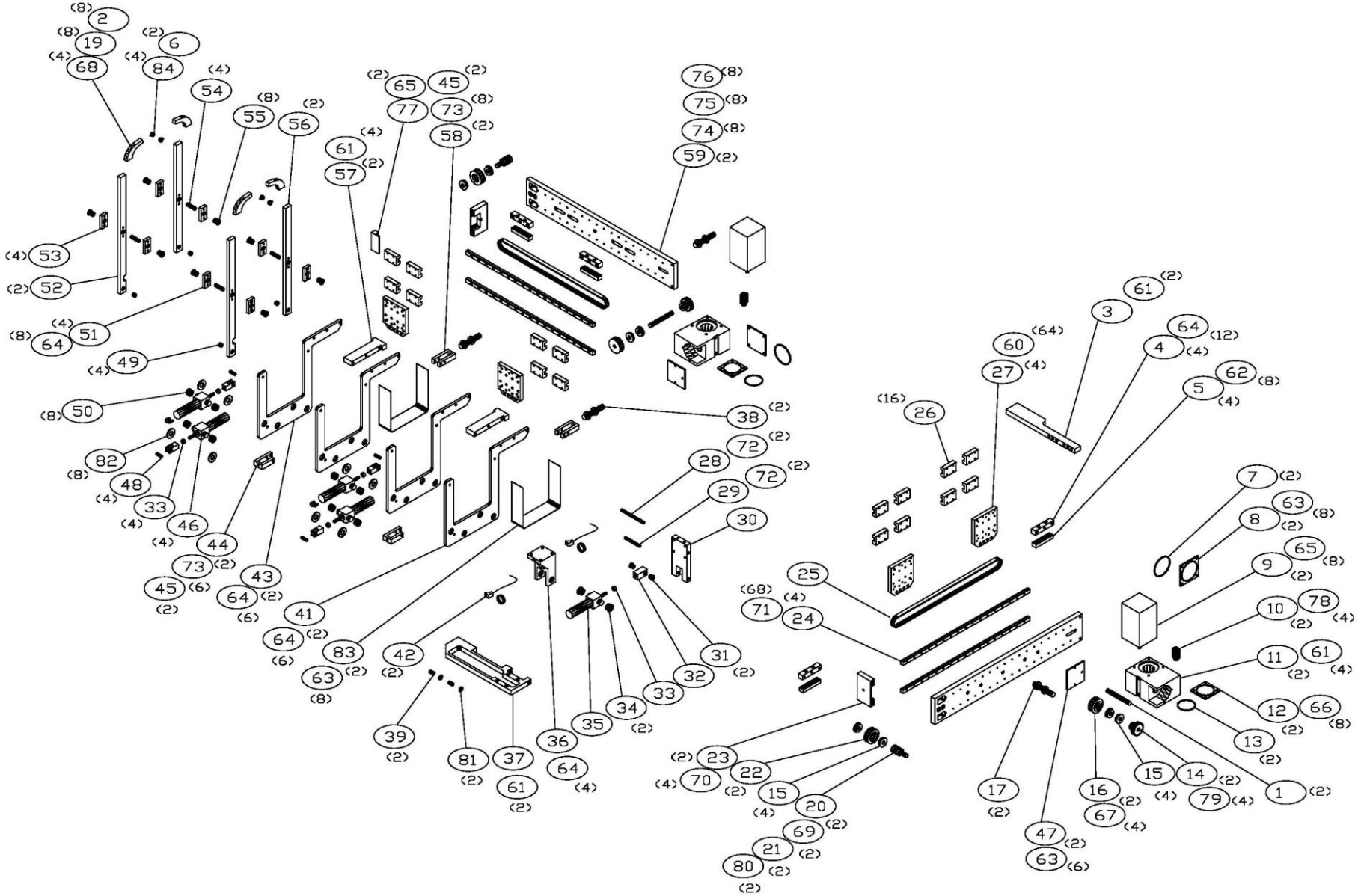
84	HW	080-00-0506	#10-24 X 1 SHCS	6
85	HW	080-02-7005	M5 X 20 SHCS	8
86	HW	080-00-0520	#10-32 X 1 1/4 SHCS	1
87	HW	080-00-0402	#8-32 X 3/8 SHCS	3
88	HW	080-00-0605	1/4-20 X 3/4 SHCS	20
89	HW	080-00-0504	#10-24 X 3/4 SHCS	4
90	HW	080-00-0203	#6-32 X 1/2 SHCS	17
91	PP	001-10-2604	#10 HEAVY WASHER	2
92	PP	000-30-1504	#10 HEAVY WASHER	1
93	HW	080-01-8804	#8 FLAT WASHER	3
94	HW	080-00-0604	1/4-20 X 5/8 SHCS	13
95	HW	080-00-0105	#4-40 X 5/8" SHCS	58
96	PP	000-41-7702	SERVO PULLEY	1
97	HW	080-00-3705	#8-32 X 3/8 SHSS	2
98	PP	000-41-8201	MAGAZINE MOUNT PIN	2
99	PP	000-41-8101	MAGAZINE MOUNT PLATE	1
100	PP	000-41-8001	SENSOR MOUNT	1
101	PP	000-41-8401	MAGAZINE FRONT SPACER	2
102	PP	000-41-8402	MAGAZINE SIDE UPRIGHT	1
103	PP	000-41-7802	EDGE SENSOR MOUNT	1
104	PP	000-41-7803	EDGE SENSOR COVER	1
105	CC	000-51-0001	EDGE SENSOR	1
106	PP	000-41-8301	MAGAZINE SUPPORT ANGLE	1
107	HW	080-00-0609	1/4-20 X 1 1/2 SHCS	2
108	HW	080-02-6807	M3 X 20 SHCS	2
109	HW	080-00-0509	#10-24 X 1 3/4 SHCS	4
110	HW	080-01-8808	1/4 FLAT WASHER	2
111	HW	080-00-0503	#10-24 X 5/8 SHCS	8
112	PP	000-41-8501	REAR MAGAZINE ADJUSTER	2
113	PP	000-41-8502	SIDE MAGAZINE ADJUSTER	2
114	PP	000-41-8503	REAR ADJUSTER LINK	1
115	PP	000-41-8601	BEARING SPACER	4
116	CC	000-31-3901	LINEAR BEARING	4
117	CC	000-31-4001	5/8 RETAINING RING	8
118	PP	000-41-8701	LINEAR SHAFT	2
119	PP	000-41-8702	LINEAR SHAFT	2
120	PP	000-41-8801	REAR ADJUSTER MOUNT	1
121	PP	000-41-8802	SIDE ADJUSTER MOUNT	1
122	PP	000-41-8901	SIDE ADJUSTER ARM	1
123	PP	000-41-8902	REAR ADJUSTER ARM	1
124	HW	080-00-0516	#10-32 X 5/8 SHCS	4
125	PP	000-41-9001	ADJUSTER STOP ARM	2
126	CC	000-80-3901	ADJUSTER STOP KNOB	2

MAGAZINE PICKUP PLATES



PICKUP PLATE ASSEMBLY				
Detail #	Series	Urania #	Description	Qty
1	CC	000-10-1301	BELLOWS VACUUM CUP	
2	PP	000-41-5301	BELLOW CUP STANDOFF	
3	PP	000-41-5401	SHORT CUP SPACER	
4	PP	000-41-5601	MODIFIED SETSCREW	
5				
6	HW	080-00-1701	1/4-20 X 3/8 TRUSS HEAD	5
7	CC	1063	1/4 AIR FITTING	1
8				
9				
10	HW	080-00-0607	1/4-20 X 1 SHCS	2
11	PP	VARIOUS	VVACUUM PLATE	1

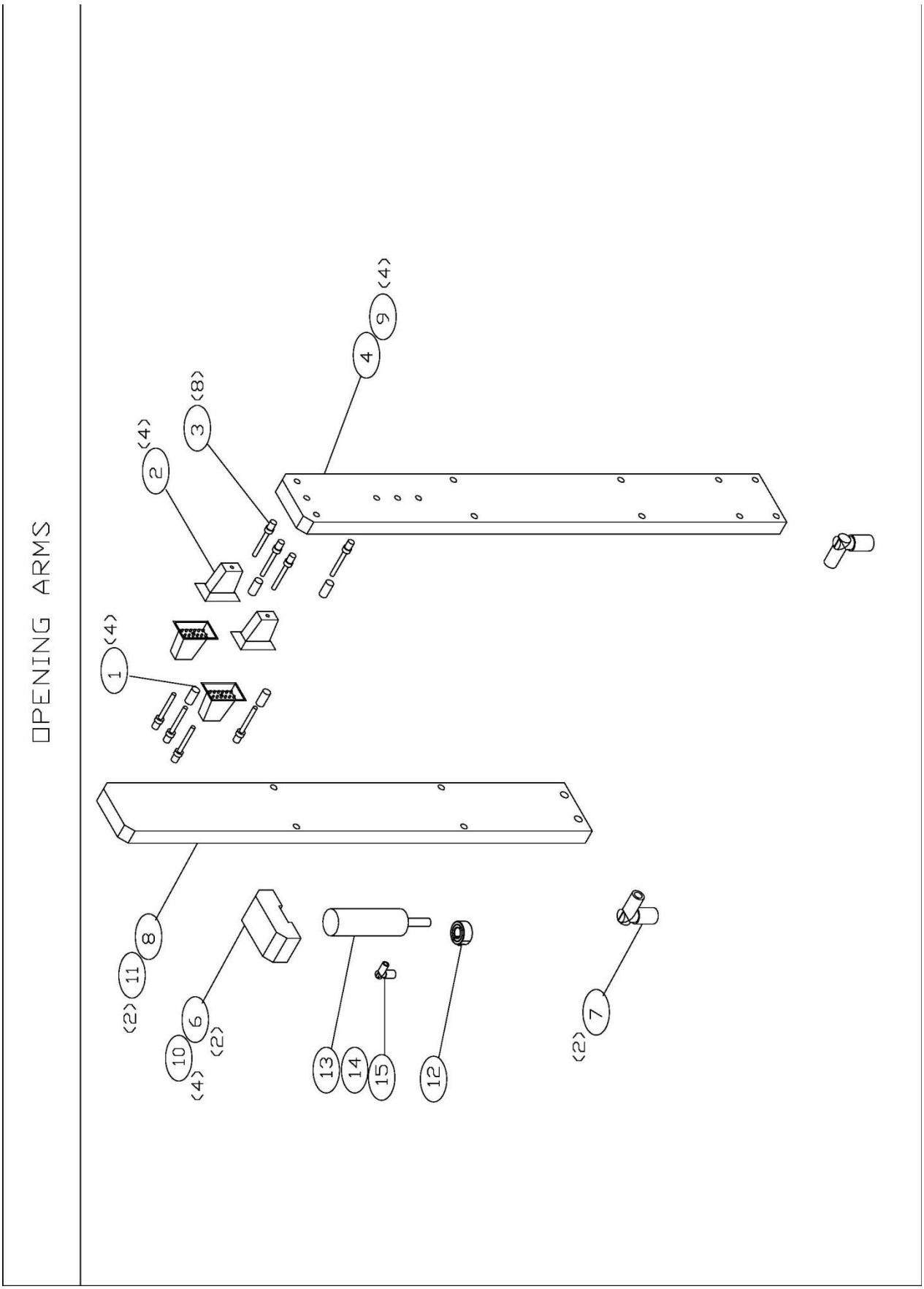
OPENING AND GRIPPER ARMS



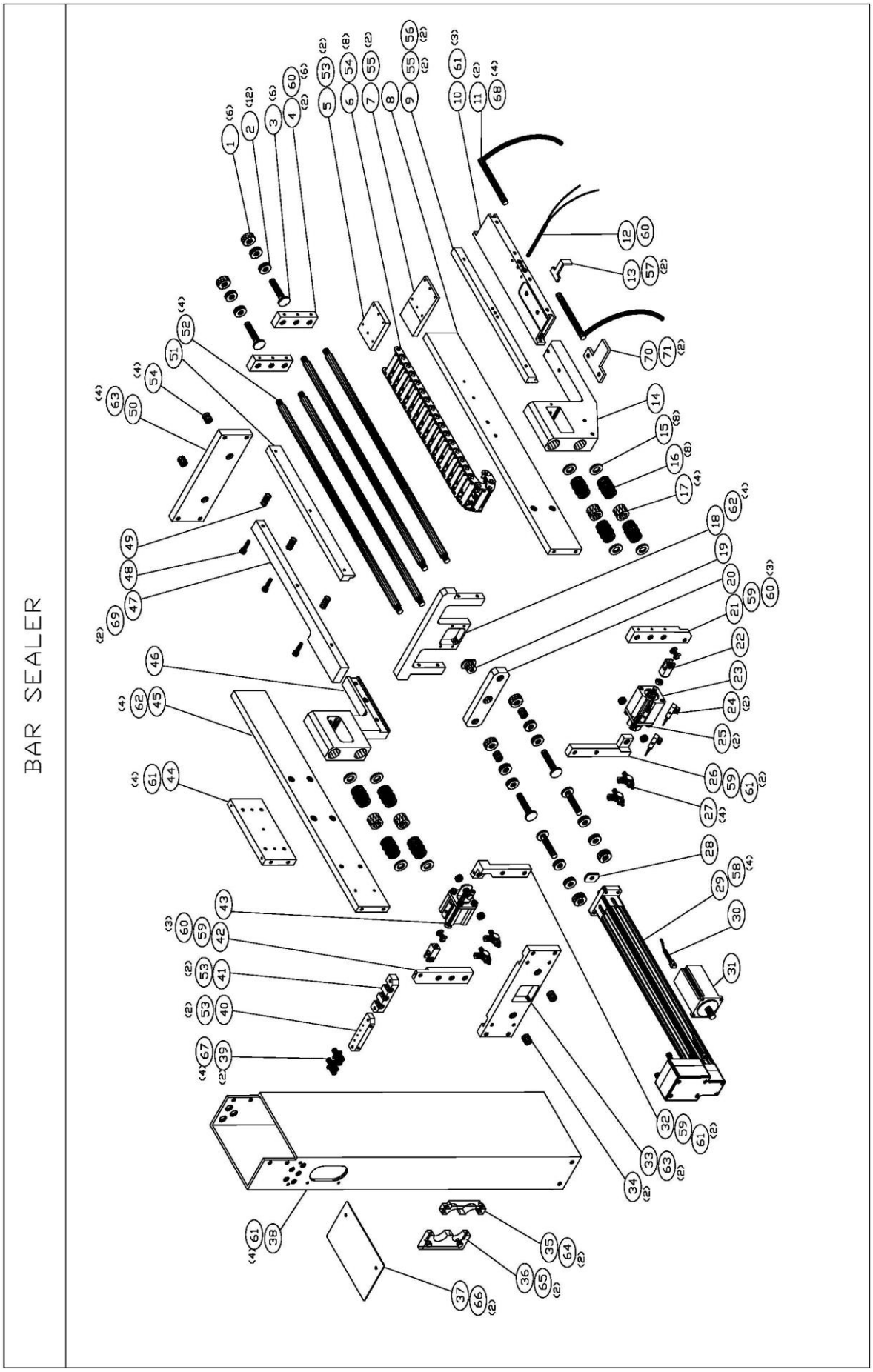
OPENING AND GRIPPER ARM ASSEMBLY				
Detail #	**Series**	**Urania #**	**Description**	**Qty**
1	PP	000-10-0402	SERVO DRIVE SHAFT	2
2	HW	080-01-8806	#10 FLAT WASHER	8
3	PP	000-10-4502	FIXED REMOTE ARM MOUNT	1
4	PP	000-10-4601	TOP BELT CLAMP	4
5	PP	000-10-4602	BOTTOM BELT CLAMP	4
6	HW	080-01-8834	#6 LOCK WASHER	2
7	CC	001-00-1701	O-RING	2
8	PP	000-10-4005	LARGE SERVO COVER	2
9	PP	000-10-0502	SERVO TRANSFER MOTOR	2
10	CC	8504	SERVO WORM	2
11	PP	000-00-8604	SERVO BLOCK	2
12	PP	000-10-4006	SMALL SERVO COVER	2
13	CC	001-00-1601	O-RING	2
14	CC	8503	SERVO WORM GEAR	2
15	CC	657A	BALL BEARING	8
16	PP	000-10-2803	SERVO DRIVE PULLEY	2
17	CC	8358-2882	PROXIMITY SENSOR	2
18	PP	000-10-4701	REMOTE ARM SERVO PLATE	1
19	HW	081-00-1108	#10-24 X 3/4 LOW HEAD SHCS	8
20	PP	000-10-2502	SERVO IDLER MOUNT	2
21	HW	3/8RET	RETAINING RING 3/8 SHAFT	2
22	PP	000-10-2802	SERVO IDLER PULLEY	2
23	PP	000-10-4901	SERVO END BLOCK	2
24	PP	000-41-6602	THOMSON RAIL	4
25	PP	000-10-4603	SERVO BELT	2
26	CC	8512	THOMSON CARRIAGE	16
27	PP	000-10-4702	SERVO CARRIAGE PLATE	4
28	PP	000-10-5001	REMOTE ARM PIVOT SHAFT	1
29	PP	000-10-5002	REMOTE ARM PIVOT SHAFT	1
30	PP	000-10-5003	PIVOT REMOTE ARM BLOCK	1
31	CC	000-30-6401	PIVOT REMOTE ARM BUSHING	2
32	PP	000-10-5004	PIVOT REMOTE ARM CLEVIS	1
33	HW	081-00-0103	1/4-28 JAM NUT	5
34	CC	000-31-1101	PIVOT CYLINDER BUSHING	2
35	CC	000-60-2501	PIVOT REMOTE ARM CYLINDER	1
36	PP	000-10-5101	PIVOT CYLINDER BLOCK	1
37	PP	000-10-5103	PIVOT CYLINDER ARM	1
38	CC	000-50-9901	M8 PROX SENSOR	2
39	CC	000-30-5101	PIVOT ARM BUSHING	2

40	CC	000-10-6001	GRIPPER COVER	2
41	PP	000-10-5201	RIGHT GRIPPER PLATE	2
42	CC	000-50-9601	PIVOT SENSOR	2
43	PP	000-10-5202	LEFT GRIPPER PLATE	2
44	PP	000-10-5301	FRONT BUMPER MOUNT	2
45	CC	000-31-1401	RUBBER BUMPER	4
46	PP	001-00-8801	GRIPPER CYLINDER ASSY	4
47	PP	000-10-5401	SIDE SERVO COVER	2
48	CC	000-60-2601	GRIPPER CYLINDER CLEVIS	4
49	CC	000-30-6301	GRIPPER ARM BUSHING	4
50	CC	000-30-6001	GRIPPER CYLINDER BUSHING	8
51	PP	000-10-5504	INNER GRIPPER MOUNT PLATE	4
52	PP	000-10-5606	FRONT GRIPPER ARM	2
53	PP	000-10-5503	OUTER GRIPPER MOUNT PLATE	4
54	PP	000-10-5701	GRIPPER PIN	4
55	CC	000-31-1301	GRIPPER MOUNT BUSHING	8
56	PP	000-10-5604	REAR GRIPPER ARM	2
57	PP	000-10-5801	GRIPPER MOUNT ARM	2
58	PP	000-10-5902	REAR BUMPER MOUNT	2
59	PP	000-10-4704	GRIPPER SERVO PLATE	2
60	HW	080-05-2201	M2.5 X 10 SHCS	64
61	HW	080-00-0605	1/4-20 X 3/4 SHCS	12
62	HW	080-00-0503	#10-24 X 5/8 SHCS	8
63	HW	080-00-1502	#8-32 X 3/8 TRUSS HD	30
64	HW	080-00-0404	#8-32 X 5/8 SHCS	30
65	HW	080-00-0502	#10-24 X 1/2 SHCS	10
66	HW	080-00-1602	#10-24 X 3/8 TRUSS HD	8
67	HW	080-00-3815	#10-32 X 1/2 SHSS	4
68	PP	000-10-5605	TIP MOUNT ARM	4
69	HW	080-00-0624	1/4-28 X 1 SHCS	2
70	HW	080-00-0506	#10-24 X 1 SHCS	4
71	HW	080-00-0104	#4-40 X 1/2 SHCS	68
72	HW	080-00-3707	#8-32 X 1/2 SHSS	4
73	HW	080-00-0403	#8-32 X 1/2 SHCS	8
74	HW	080-00-0706	5/16-18 X 1 SHCS	8
75	HW	080-01-8809	5/16 FLAT WASHER	8
76	CC	001-00-0401	M8 X 10MM T-NUT	8
77	PP	000-10-6201	HOME FLAG	1
78	HW	080-00-0301	#6-32 X 1/4 SHCS	2
79	HW	080-00-0501	#10-24 X 3/8 SHSS	4
80	HW	080-00-0409	#8-32 X 1 1/2 SHCS	2
81	CC	000-30-1201	1/4 X .060 PLASTIC SHIM	2
82	CC	000-30-8901	1/2 X .030 PLASTIC SHIM	8

83	CC	000-10-6001	GRIPPER COVER	2
84	CC	000-30-9301	GRIPPER TIP	4


OPENING ARMS
1 (4)
2 (4)
3 (8)
4
9 (4)
8
11 (2)
6 (2)
10 (4)
13
14
15
12
7 (2)

OPENING ARM ASSEMBLY				
Detail #	**Series**	**Urania #**	**Description**	**Qty**
1	CC	000-10-0901	VACUMM CAP	4
2	PP	1081	VACUUM CUP	4
3	PP	1002	VACUUM CUP PIN	8
4	PP	000-80-3301	PIVOT REMOTE ARM	1
5				
6	PP	000-80-3703	VIBRATION MOUNT	1
7	CC	1063	1/8 NPT X 1/4 SWIVEL	2
8	PP	000-80-3303	FIXED REMOTE ARM	1
9	HW	080-00-0605	1/4-20 X 3/4 SHCS	4
10	HW	080-00-0506	#10-24 X 1 SHCS	2
11	HW	080-00-0608	1/4-20 X 1 1/4 SHCS	2
12	CC	000-31-3401	5/16 SHAFT COLLAR	1
13	CC	000-60-8501	VIBRATION DEVICE	1
14	HW	080-02-7104	M6 X 16 SHCS	1
15	CC	000-60-9401	VIBRATION FLOW CONTROL	1


BAR SEALER

BAR SEALER				
Detail #	Series	Urania #	Description	Qty
1	CC	000-30-8201	3/8 SHAFT COLLAR	6
2	CC	000-30-2201	3/8 THRUST WASHER SET	12
3	PP	002-00-0001	PIVOT PIN	6
4	PP	002-00-0101	REAR PIVOT BLOCK	2
5	PP	002-00-0201	UPPER TROUGH MOUNT	1
6	CC	000-10-4101	CABLE TROUGH	3 FT
7	PP	002-00-0202	LOWER TROUGH MOUNT	1
8	PP	002-00-0301	FRONT PLATE	1
9	PP	002-00-0403	HEATING BAR	1
10	PP	002-00-0501	HEATING BAR MOUNT	1
11	CC	3505-230	HEATING ELEMENT	2
12	CC	3504-2	THERMOCOUPLE	1
13	PP	002-00-0601	THERMOCOUPLE GUARD	1
14	PP	002-00-0701	HEATER PIVOT ARM	1
15	CC	157	LINEAR SEAL	8
16	CC	156	LINEAR BEARING	6
17	PP	002-00-0801	BEARING SPACER	4
18	PP	002-00-0901	SERVO CYLINDER MOUNT	1
19	PP	002-00-1001	SERVO ROD END	1
20	PP	002-00-1101	SERVO LINK ARM	1
21	PP	002-00-1201	LOWER CYLINDER PIVOT	1
22	CC	000-60-8801	CLEVIS	2
23	CC	000-60-8701	MAGNETIC CYLINDER	1
24	CC	000-51-0901	MAGNETIC SENSOR	2
25	PP	002-00-1301	MODIFIED REAR CLEVIS	2
26	PP	002-00-1401	LOWER CYLINDER ARM	1
27	CC	1153	FLOW CONTROL	4
28	PP	002-00-1002	SERVO CYLINDER WASHER	1
29	CC	000-60-8601	SERVO CYLINDER	1
30	CC	000-51-1001	SERVO SENSOR	1
31	CC	000-90-2301	SERVO MOTOR	1
32	PP	002-00-1402	UPPER CYLINDER ARM	1
33	PP	002-00-0302	LEFT PLATE	1
34	CC	000-30-4301	BRASS BUSHING	6
35	PP	000-80-3601	SMALL SERVO CLAMP	1
36	PP	000-80-3602	LARGE SERVO CLAMP	1
37	PP	002-00-1501	UPRIGHT COVER	1
38	PP	002-00-1502	BAR HEATER UPRIGHT	1

39	CC	000-10-1501	AIR LINE WYE	2
40	PP	002-00-1601	UPPER CABLE CLAMP	1
41	PP	002-00-1602	LOWER CABLE CLAMP	1
42	PP	002-00-1202	UPPER CYLINDER PIVOT	1
43	CC	000-60-8901	PIVOT CYLINDER	1
44	PP	002-00-1503	BAR SEALER MOUNT PLATE	1
45	PP	002-00-0304	REAR PLATE	1
46	PP	002-00-0702	COOLING BAR PIVOT ARM	1
47	PP	002-00-0703	COOLING BAR MOUNT	1
48	HW	081-00-0901	SHOULDER SCREW	3
49	CC	000-40-3401	COOLING BAR SPRING	3
50	PP	002-00-0303	RIGHT PLATE	1
51	PP	002-00-0704	COOLING BAR	1
52	PP	002-00-1701	LINEAR SHAFT	4
53	HW	080-00-0504	#10-24 X 3/4 SHCS	6
54	HW	080-00-0307	#6-32 X 1 SHCS	8
55	HW	080-00-0508	#10-24 X 1 1/2 SHCS	4
56	HW	080-00-0502	#10-24 X 1/2 SHCS	2
57	HW	080-00-9606	#8-32 X 1/2 FHMS	2
58	HW	080-00-0406	#8-32 X 7/8 SHCS	4
59	HW	080-00-3605	#6-32 X 3/8 SHSS	4
60	HW	080-00-3705	#8-32 X 3/8 SHSS	13
61	HW	080-00-0604	1/4-20 X 5/8 SHCS	14
62	HW	080-00-0605	1/4-20 X 3/4 SHCS	8
63	HW	080-00-0607	1/4-20 X 1 SHCS	8
64	HW	080-00-0506	#10-24 X 1 SHCS	2
65	HW	080-00-0503	#10-24 X 5/8 SHCS	2
66	HW	081-00-1106	#10-24 X 1/2 TRUSS HEAD	2
67	HW	080-00-0106	#4-40 X 3/4 SHCS	4
68	HW	080-00-3807	#10-24 X 3/4 SHSS	4
69	HW	080-00-0606	1/4-20 X 7/8 SHCS	2
70	PP	002-00-1801	TERMINAL STRIP MOUNT	1
71	HW	080-00-9805	1/4-20 X 1/2 FHMS	2

SABVI SPARE PARTS LIST		
3615	Fuse (Fan)	2
3555	Fuse (Heaters)	2
3505-230	230 Watt Heater	1
3504-2	J - Thermocouple	1
000-50-1101	PROXIMITY SENSOR	1
000-50-7003	M8 PROX CABLE	1
7542-C	RIGHT ANGLE CABLE	1
000-50-9701	PROX SENSOR	1
000-51-1301	PATCH CABLE	1
000-50-9901	GRIPPER PROX	1
000-60-2501	PIVOT REMOTE ARM CYLINDER	1
001-00-8801	GRIPPER CYLINDER ASSY	1
000-41-1702	TRANSFER CYLINDER	1
1153	FLOW CONTROL	2
000-50-6501	PIVOT SENSOR	1
000-60-9201	GATE PIVOT CYLINDER	1
000-60-9301	GATE OPEN CYLINDER	1
000-50-2101	GATE OPEN SENSOR	1
000-20-3601	SERVO BELT	4
000-10-4603	MODIFIED SERVO BELT	1
000-31-1401	RUBBER BUMPER	4
000-30-9301	GRIPPER TIP	8
000-10-0901	VACUUM CAP	10
000-20-3003	COOLING BAR FOAM	5
1083-	VACUUM FILTER	3
000-10-1301	BELLOWS VACUUM CUP	8
000-50-9301	MAGNETIC SENSOR	1
000-51-1501	KEY	1
000-51-0901	PIVOT CYLINDER SENSOR	1
000-60-8701	PIVOT CYLINDER W/ SENSOR	1
000-60-8901	SEALER PIVOT CYLINDER	1
000-10-3401	AIR VALVES	1

000-10-3301	VACUUM VALVES	1
000-10-3501	INLINE FLOW CONTROL	1
551	BEARING SEAL	6
157	BEARTING SEAL	4
1154	LINEAR BALL BEARING	6
156	LINEAR BEARING	4
000-51-1601	SERVO CYLINDER SENSOR	1
1080-	Blue VACUUM CUPS	8

SECTION 5.0

ELECTRICAL DRAWINGS