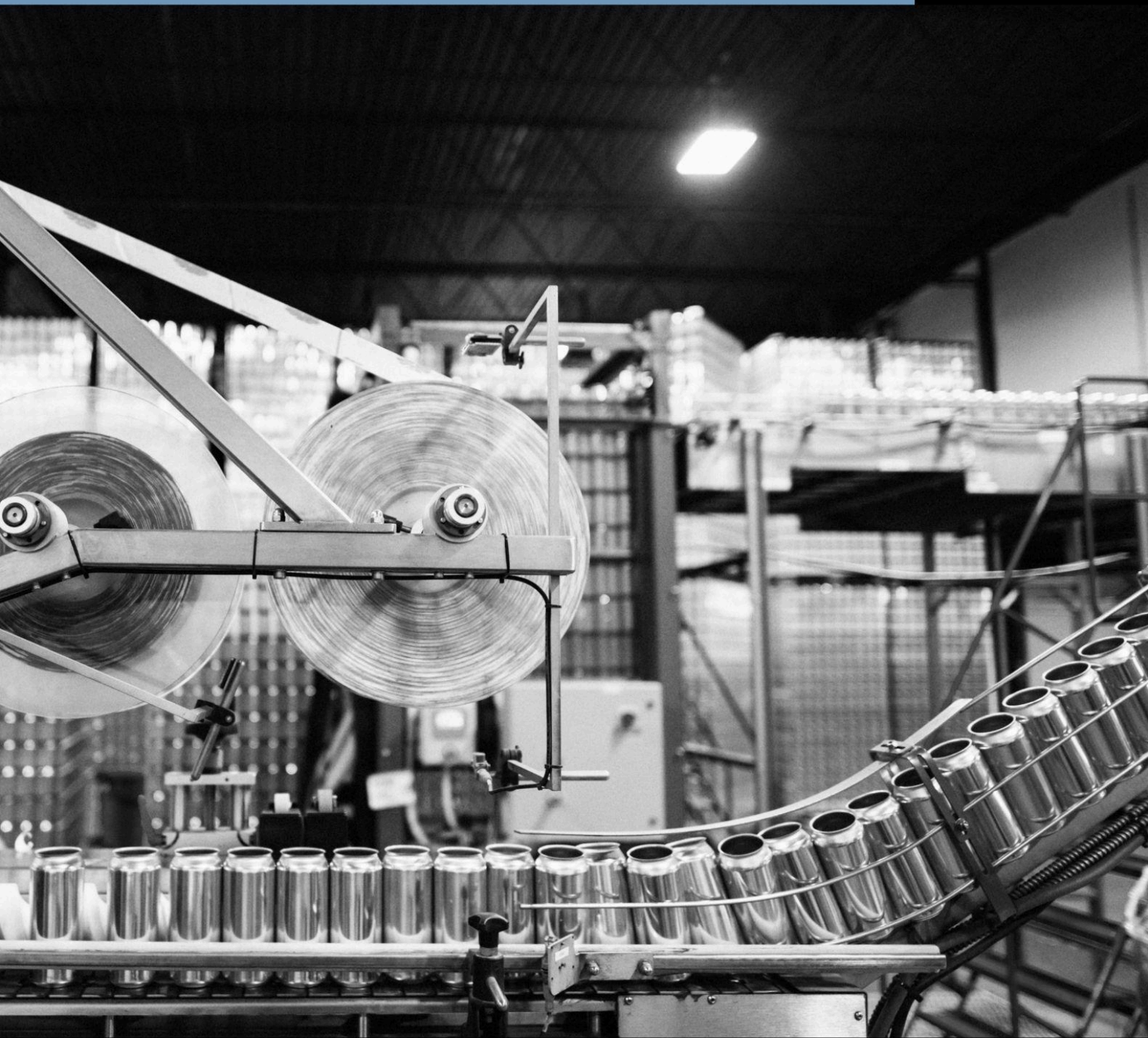


FAR BULK PALLETIZER USER MANUAL



MANUAL VERSION 3.4.1

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This is User Manual Version 3.4.1, which covers FAR Bulk Palletizers manufactured or retrofitted beginning in July 2022.

This Manual covers installed software version 3.1.0120. Your current software version can be found on the Splash Screen as shown below.



Fig. 1: Splash Screen showing your software version

1 Technical Specifications

The intended use of the FAR Bulk Palletizer is to move empty cans from the outfeed of a machine such as a sleeve, labeler or printer onto standard 44 in. by 56 in. storage pallets. The FAR will place the cans in superposed layers separated by a tier sheet. Any other use is prohibited.

Table 1: FAR Technical Specifications

Height:	Infeed height + 25 in (63.5 cm)
Approximate Weight (varies):	Palletizer, 2315 lbs (1,050 kg); Mat Top Conveyor, 1430 lbs (650 kg); Idle End, 660 lbs (300 kg)
Lifting Capacity:	300 lbs (136 kg) DO NOT EXCEED
Power Requirements (Standard 4VFD Version):	208-240 V / 1 or 3 Ph / 50-60 Hz / FLA 28.8 A @ 1 Ph, 17.4 A @ 3 Ph / SCCR 5kA 400-480 V / 3 Ph / 50-5=60 Hz / FLA 9.1 A / SCCR 5kA
Control Circuit:	24 V DC
Air Requirements:	5-6 CFM at 80 psi
Sound Pressure Level:	<70 dbA at Operator Station (Control Panel)

2 Machine Safety

2.1 Safety Features

The Palletizer is equipped with a light curtain on the operator side of the machine that pauses the machine when the beam is broken. This allows operators to reach in to fix issues while the machine is running. The machine will pause and wait for the operator to clear the beam before it resumes operation.

The machine is also equipped with a Manually-opened Safety Gate with IDEM safety switch. The switch includes a solenoid interlock requiring power to unlock and is IP67 rated. The Safety Gate will remain locked until the Carriage is in the DOWN position and power is applied to the machine.

2.2 Electrical Safety

The standard FAR Bulk Palletizer runs on 208-220 V 1 Ph or 3 Ph power. 480 V 3 Ph versions are also available. Electrical utility connections should be made in accordance with local electrical code requirements.

2.3 Warning Labels

These Warning Labels (Fig. 2) are intended to identify potential hazards.



Fig. 2: Warning Labels

2.4 Safety Guidelines

The following safety guidelines are intended to ensure safe Palletizer operation.

Perform an inspection before startup to ensure nothing is obstructing movement of the Pallet Lift Carriage, Layer Sweep, Row Sweep, or Can Stop assemblies. Prior to starting operations in the Auto Sequence, test all functions on the Manual Operations screen for functionality.

Stay clear of all moving parts during operation. Ensure that anyone in the vicinity is aware that the machine is in operation.

In the event of a problem or malfunction, the red Emergency STOP button on the front of the control panel or the HMI can be pressed to stop all operations. The Emergency STOP is released by turning the button clockwise. You must press the RESET button on the front of the control panel before starting or resuming operations upon turning power on or using the Emergency STOP button.

When operating the Palletizer, always follow appropriate safety procedures. Do not operate without proper personal protective equipment (PPE) including eye protection.

Palletized cans arrive sterilized from the manufacturer. To maintain their sterilized condition, proper hygienic protocols should be followed while operating the FAR. This includes wearing gloves, hairnets, and beard nets.

Manual can handling is required during Palletizer operation. Avoid placing fingers inside cans whenever possible, even with gloves on. Instead, cans should be handled on the outside around the body of the can. Use extreme care around open cans to ensure that no contaminants (including hair, dirt, skin particles, tools, nuts, bolts, and discarded items) enter the cans.

Do not operate the FAR with pallets that are broken or in a state of disrepair. The FAR is designed to run on a level concrete floor. The user is responsible for ensuring their floor meets the mechanical stability requirements of the machine.

3 Equipment Nameplate

The FAR Bulk Palletizer nameplate is shown below in Fig. 3. The nameplate displays key information including the serial number and electrical specifications. Machine nameplates are affixed to the control panel and should not be removed.

SKA FABRICATING
545 Turner Dr Ste A Durango CO 81303 | 970-403-8562 | skafabricating.com

Model: FAR BULK REPALLETIZER

Serial Number: 7332-001

Voltage: 200v-240v 1Ø or 3Ø OR 400v-460v 3Ø

F.L.A. : HZ: 50/60hz SCCR: 5kA

Lifting Capacity: 181 kg (400 lbs)

Manufactured In:

Y M A M J J A S O N D

 month

23 24 25

 year 25



MADE IN THE USA

Fig. 3: FAR Bulk Palletizer Nameplate

4 Palletizer Overview

The FAR utilizes a Mat Top Conveyor and a layer formation and sweep system to form and sweep layers of cans onto a pallet. The major components of the system are outlined in Fig. 4.

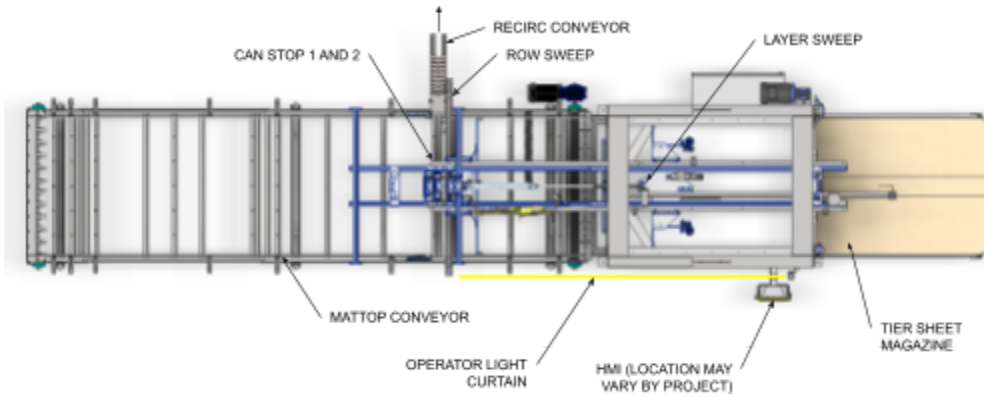


Fig. 4: Palletizer Overview

4.1 Line Setup, Sleever Enabled / Disabled

The FAR control panel includes a set of dry-contacts for a 24 V signal that can be used by the operating company to stop/start an upstream piece of equipment on the line. The control signal can be manually controlled with the SLEEVE ENABLED/DISABLED button on the OPERATE screen, but will also be automatically controlled based on the status of the Mat Top Full Photo Eye Sensor. When the Sensor is blocked, the contacts will send a stop signal. When the Sensor is cleared, a start signal will be sent. These automated controls are intended to prevent a backup of cans to the next upstream piece of equipment.

On sleeving lines, this is often used to send a stop/start signal to the sleeve applicator in the event of a backup. On lines with a Side Grip Elevator, this signal is used to stop the Side Grip Elevator.

5 Palletizer Setup

5.1 Powering Up the Palletizer

1. Turn the Power Disconnect Switch on the control panel to ON.
2. Push the blue RESET button on the control panel door.

3. Ensure compressed air is ON and supplied to the Palletizer.

NOTE: There are two separate pressure zones for the pneumatic systems of the FAR. The first air pressure regulator filter should be set at 80 psi and serves only the vacuum generator of the Tier Sheet Placement System. A second pressure regulator is provided in the air prep assembly for the rest of the pneumatic systems. The recommended pressure for this regulator is 40 psi. Finally, a separate pressure regulator is provided for the Sweep Extend/Retract Piston. The recommended pressure for this regulator is 20 psi.

5.2 Vacuum Generator Setup

1. With no tier sheet covering the vacuum cups on the Layer Sweep Assembly, turn on air to the Vacuum Generator in Manual Mode (for more on Manual Mode controls, see [Section 5.3 Manual Operations](#)) by pressing the Tier Sheet Vacuum ON/OFF button, as shown in Fig. 5. Make note of the value shown on the Vacuum Generator sensor display as the Open Air Value. (This value varies based on incoming air pressure and altitude.)



Fig. 5: Tier Sheet Vacuum ON/OFF button on Manual Mode screen

2. The Lower Pressure Setpoint is P_1. Set P_1 so that it is 1.0 higher (that is, 1.0 further into negative numbers – see Table 2) than the Open Air Value. To Set P_1, press the “M” button, as shown in Fig. 6. Make note of the value to which P_1 is set.

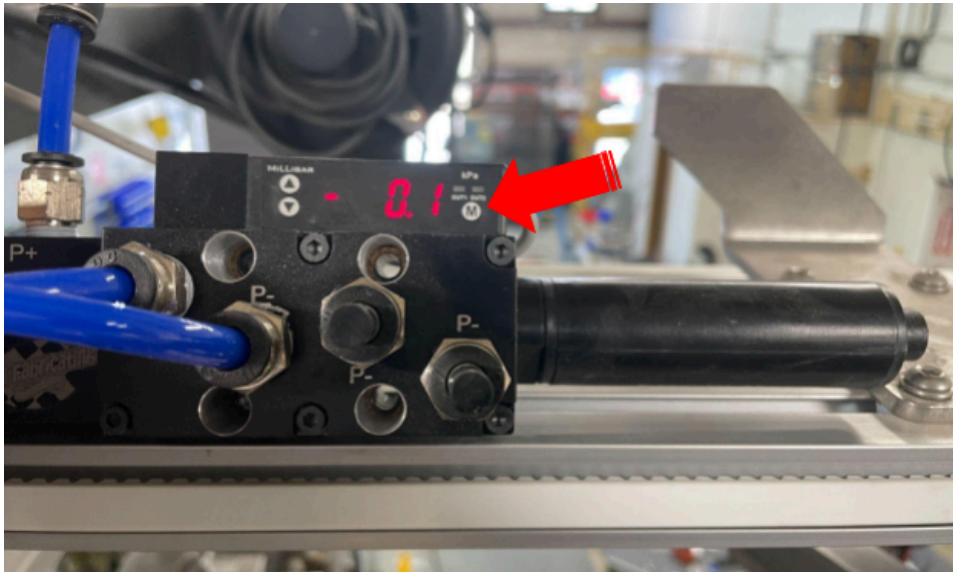


Fig. 6: "M" Button on Vacuum Generator sensor display

Table 2: Example Vacuum Sensor Settings

Setpoint	Example Value
Atmosphere	-33.2
P1	-34.2
With Tier Sheet	-51.3
P2	-52.3

- After pressing "M", the display will flash between "P_1" and the current value for P_1, as shown in Fig. 7.

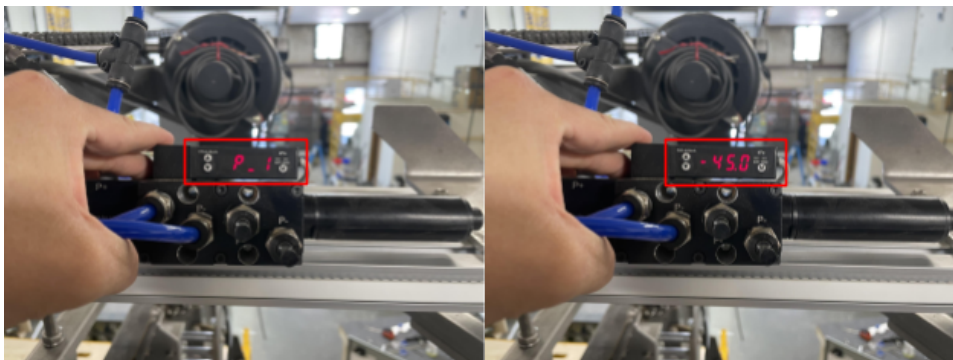


Fig. 7: Vacuum Generator sensor display alternating between "P_1" and current value

4. Use the Up and Down Arrow buttons to adjust the setpoint to the desired value as shown in Fig. 8.

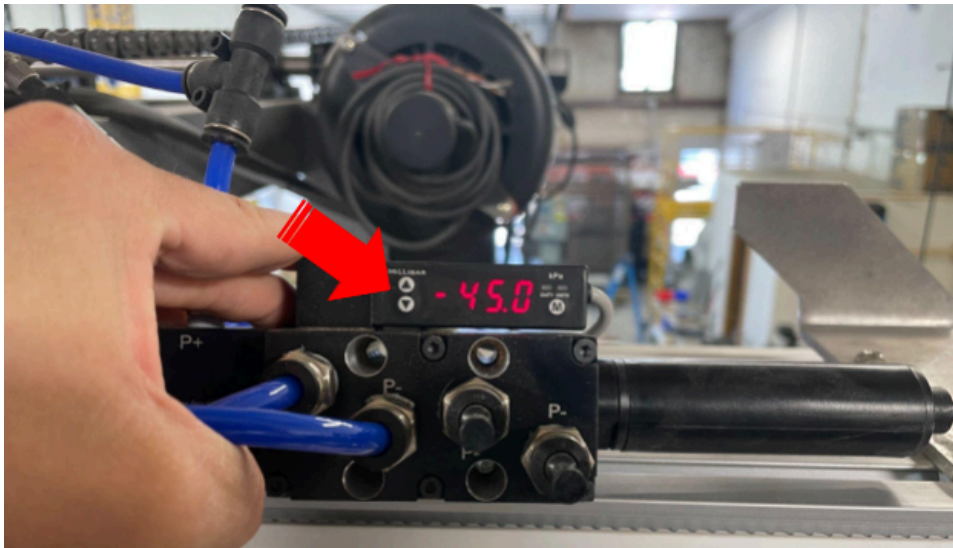


Fig. 8: Adjust pressure setpoint value using Up and Down Arrow buttons

5. Lower the Tier Sheet Vacuum Gripper so that the vacuum cups are compressed onto a tier sheet. In Manual Mode, turn on the Tier Sheet Vacuum. Make note of the Tier Sheet Vacuum Pressure.
6. Press the "M" button again to advance to P_2. The display should now flash between "P_2" and the current setpoint for P_2, as shown in Fig. 9.



Fig. 9: Vacuum Generator sensor display alternating between "P_2" and current value

7. Use the Up and Down Arrow buttons to adjust the set-point to the desired valve. Set the Upper Pressure Limit, P_2, so that it is 1.0 higher than the Vacuum Tier Sheet Pressure. Make note of the value to which P_2 is set.

8. Press the "M" button three more times. After you press it the first time, the display will flash between P_3 and its current setpoint. When you press it the second time, the display will flash between P_4 and its current setpoint. When you press it the third time, you will exit set-up mode and the display will return to its current pressure reading. This is typically about 0.0 when the vacuum generator is off.
 - a. Note: P_3 and P_4 are not used. Their value has no effect on the operation of the Depalletizer.
9. Test these setpoints.
 - a. Turn vacuum back on, with no tier sheet at the vacuum cups. The "OUT1" light (Fig. 10) should NOT come on as you should NOT achieve vacuum when the cups are open.



Fig. 10: Vacuum Generator sensor "OUT1" light off

- b. Attempt to pick-up a tier sheet in manual mode. Confirm that the "OUT1" light comes ON when you have achieved vacuum on the tier sheet, as shown in Fig. 11.



Fig. 11: Vacuum Generator sensor "OUT1" light on

Notes for operating:

1. Vacuum generator performance is a function of the incoming pressure set-point. The recommended inlet pressure (which can be adjusted at the air-prep unit) is 80 psi. Adjusting this value will change the vacuum pressure that can be achieved by the vacuum generator. If the incoming pressure set-point is changed, it is recommended that you repeat the set-up steps below.
2. Vacuum generator performance is also a function of the tier sheet material. In general, plastic tier sheets are less porous and therefore can achieve a higher vacuum pressure than a kraft board or cardboard tier sheet. If your containers are palletized using more than one tier sheet material, it is recommended that you complete these set-up steps for each tier sheet material and change the P_1 and P_2 values to correspond with the tier sheet material being used at any given time.

5.3 Pallet Loading

1. Load an empty pallet into the FAR. Ensure it is pushed all the way against the back of the Pallet Lift Carriage.
2. Place a tier sheet onto the empty pallet.
3. Press the OPERATE SCREEN button (Fig. 12) on the HMI to navigate to the Operate Screen.



Fig. 12: HMI Screen – Start-Up (Splash Screen) OPERATE SCREEN button

5.4 Configuration for Can Size – Odd Row Removal

Depending on the container to be palletized, odd row removal may or may not be required to achieve industry-standard layer container patterns. Table 3 outlines whether odd row removal is required for several common can sizes.

Table 3: Can Sizes and Necessity of Odd Row Removal Based on Nesting Pattern

BODY DIAMETER	CAN VOLUME	STANDARD CANS/LAYER	ODD ROW REMOVAL REQUIRED?
211	8 oz/12 oz/16 oz/19.2 oz	389	YES
204	12 oz Sleek	506	NO
207.5	12 oz Sleek	472	YES
307	32 oz Crowler	240	NO
202	187 ml/250 ml	586	YES

5.5 Set Layer Count

The number of layers to be palletized can be set from the Operate Screen. When the number of layers is reached, the FAR will automatically lower the pallet to expedite pallet change-out. For reference, the typical maximum number of layers on a pallet for common can sizes is shown in Table 4. The actual number of layers will depend on dunnage specifications (pallet thickness, etc.).

Table 4: Can Sizes and Max Layers Per Pallet

CAN SIZE	BODY DIAMETER	MAX LAYERS / PALLET
(8.4 OZ) 250 ML	202	18
12 OZ SLEEK	204	16
12 OZ SLEEK	207.5	17
12 OZ	211	21
16 OZ	211	16
19.2 OZ	211	13
32 OZ CROWLER	307	13

6 Auto & Manual Operations Walkthrough

6.1 Auto Operations Sequence

6.1.1 Conveyor Start-up

Press the MAT TOP START and IN FEED START buttons (Fig. 13) to start the conveyors.

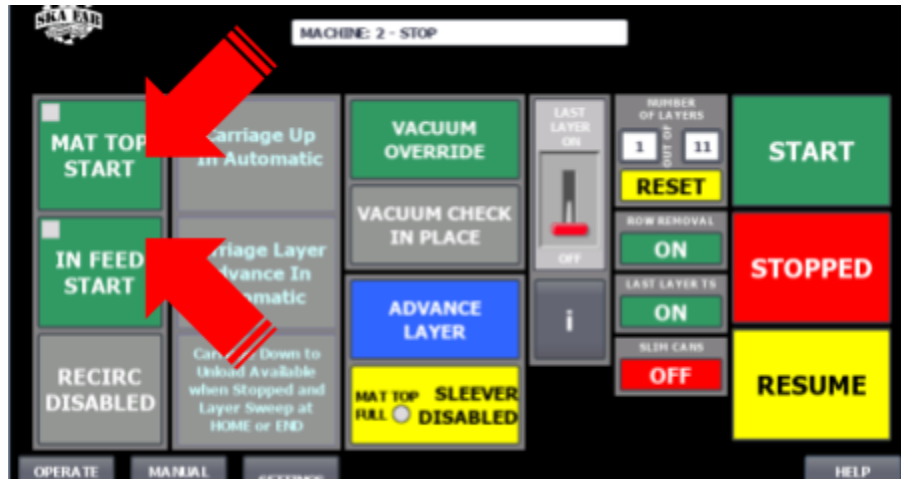


Fig. 13: HMI Screen – Conveyor Start-up

6.1.2 Starting the Auto Sequence

1. Press the START button (Fig. 14) on the HMI.

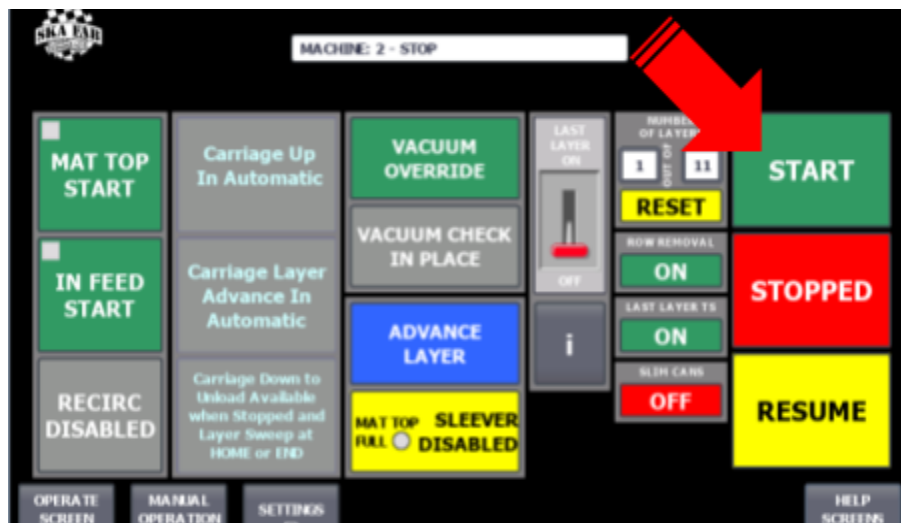


Fig. 14: HMI Screen – Auto Sequence Start

Starting the Auto Sequence will raise the pallet in the Pallet Lift Carriage and will arrange the layer formation and sweep components into the correct configuration to begin feeding cans. Each component will be placed into the state shown in Table 5. If they are not already in this state, pressing the START button will move these components into the correct state.

Table 5: Components and Starting States

Component	Starting State
Can Stop 1	UP
Can Stop 2	UP
Odd Row Removal Sweep (ROW SWEEP)	UP
Layer Sweep	UP
Deadplate	UP

2. The Pallet Lift Carriage will stop when the Pallet Height Photo Eye is blocked.
3. Once the Pallet Lift Carriage stops, ensure the tier sheet is positioned just below the edge of the adjacent UHMW Deadplate by about ¼ in. This will ensure a small step down as the cans are swept onto the pallet. If the pallet and/or tier sheet is above the top of the Deadplate, adjust the Pallet Height Photo Eye down. Then move the Pallet Lift Carriage down in Manual Mode on the HMI and restart the Auto Sequence to confirm the adjusted height of the Pallet Height Photo Eye. Repeat as necessary to achieve the correct Photo Eye height placement.
4. Begin running cans.
5. As back pressure builds on the Conveyor, the proper nesting pattern will be set as cans reach the scalloped Deadplate at the front edge of the Conveyor. When sufficient cans are accumulated so that cans are populated across the full width of the Deadplate, the Deadplate Primed Photo Eye Sensor (Fig. 15) should be blocked and ON. If cans are present in front of the sensor but no light appears, adjust the sensitivity of the sensor using a small screwdriver.

NOTE: Only adjust the sensitivity. DO NOT CHANGE THE SENSOR FROM LIGHT MODE TO DARK MODE.

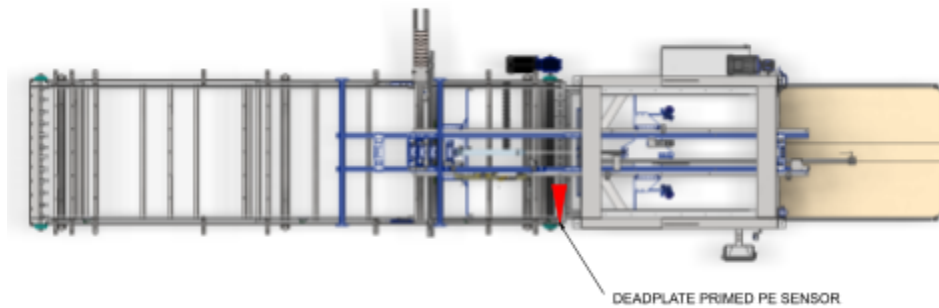


Fig. 15: Deadplate Primed PE Sensor

When first loading the Conveyor with cans, it may be necessary to manually adjust the cans to achieve the correct pattern and fill potential voids. After the first layer is set, the pattern will continue to propagate through the cans, requiring rare operator intervention.

6. As cans accumulate, they will eventually reach the Enough Cans Photo Eye (Fig. 16), which is typically set so that approximately two layers of cans are accumulated on the Conveyor. See Step 5 if sensor adjustment is required to sense cans in front of the sensor.

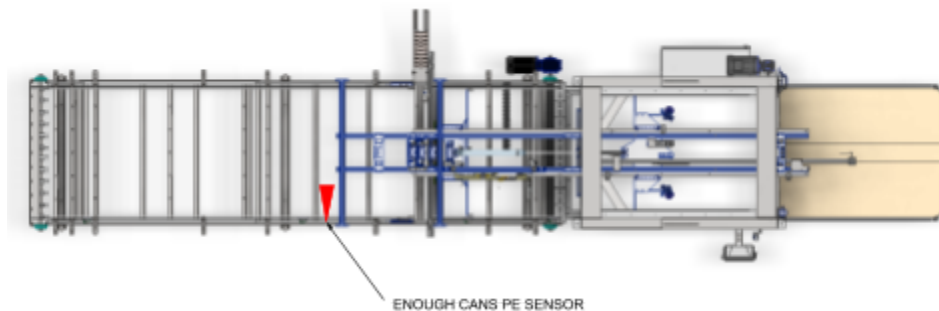


Fig. 16: Enough Cans PE Sensor

7. When the Enough Cans Photo Eye Sensor is blocked, the pins of Can Stop 1 and Can Stop 2 will lower.
8. The Deadplate will then lower, allowing the layer of cans to advance partially onto the pallet.
9. The Layer Sweep will travel to the L Sweep at Arm Drop PROX sensor, advancing the layer of cans partially into the Palletizer. With the Layer Sweep at the Mid Position PROX, the Layer Sweep Clear Sensor (Fig. 17) must see itself in the reflector on the opposite side of the Conveyor. The Layer Sweep will then lower and sweep the layer of cans onto the pallet.

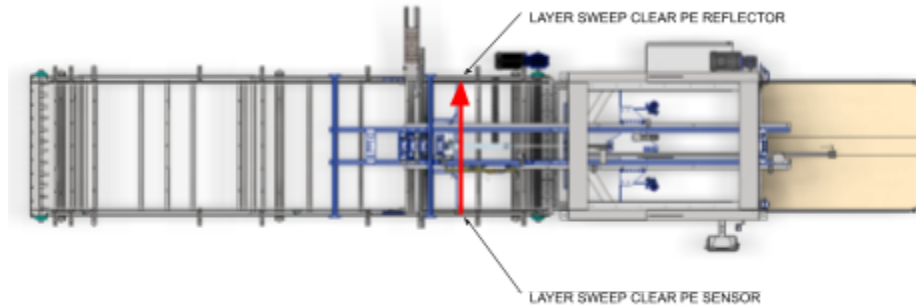


Fig. 17: Layer Sweep Clear PE Sensor and Reflector

10. Once the layer is swept onto the pallet, the Pallet Lift Carriage will descend until the Pallet Height Photo Eye Sensor is clear.
11. While the pallet is lowering, the Sweep will pick up a tier sheet from the Tier Sheet Magazine.
12. Once vacuum is achieved on the tier sheet, the Sweep will pull the tier sheet onto the pallet as it returns to the Front Position to sweep the next layer.
13. The pallet will rise until the Can Height Photo Eye is blocked. Again, ensure the tier sheet is below the Deadplate by approximately $\frac{1}{4}$ in. so the cans step down as they are swept onto the pallet.

6.1.2.1 Odd Row Removal Sequence

1. During the layer sweep process, the Row Sweep will remove the odd row for the accumulated cans if ODD ROW REMOVAL is turned on. The status of the Odd Row Removal sequence is set by the ROW REMOVAL button on the Operate Screen, as shown in Fig. 18.

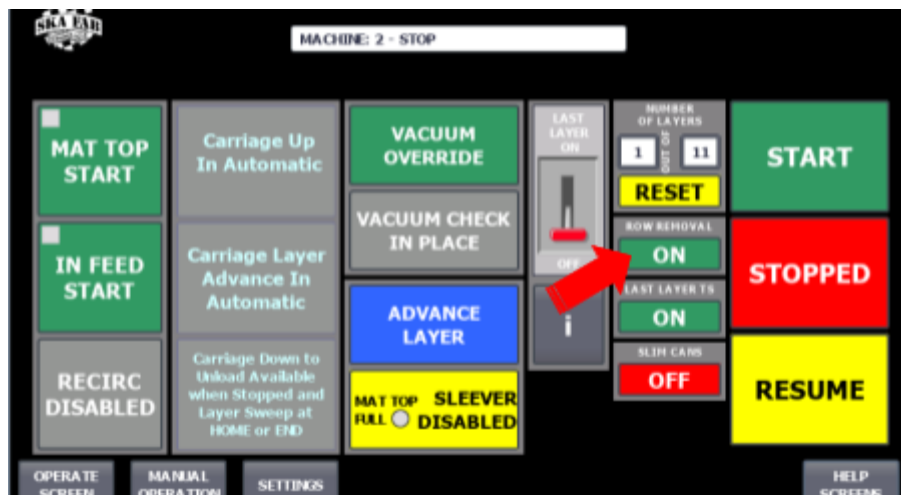


Fig. 18: HMI Screen – ROW REMOVAL Button

2. The Row Sweep will lower.
3. The Mat Top Conveyor will automatically slow to the Mat Top Slow Speed. If the Slow Speed is set to zero, the Conveyor will momentarily stop.
4. The pins of Can Stop 2 will raise, releasing this row of cans to advance to the Row Sweep. The Conveyor will return to the Mat Top Normal Speed Setpoint. See [Section 8.5: Conveyance Settings](#) (Page 40) for more information on adjusting conveyance setpoints.
5. The pins of Can Stop 2 will lower, filling the voids between the cans still retained by the Can Stop 1 pins.
6. The Row Sweep Hook will advance, pushing the cans off the Conveyor and onto the Recirc Conveyor.
7. The Row Sweep Hook will return home.
8. Once the Row Sweep Hook returns home, the Row Sweep will raise.
9. Once the Row Sweep has raised, the Mat Top Conveyor will slow to the Mat Top Slow Speed Setpoint. If the Setpoint is set to zero, the Conveyor will momentarily stop.
10. The pins of Can Stop 1 will raise. The Mat Top Conveyor will then return to the Mat Top Normal Speed Setpoint, releasing the cans on the Mat Top to advance to the Deadplate.
11. If Odd Row Removal is off, the machine will not clear odd rows of cans from the pattern. See Table 3 ([Section 5.4](#), Page 12), which shows different can sizes and whether they create a pattern that requires Odd Row Removal.
12. Repeat this process until the pallet reaches the desired number of layers, which can be set on the Operate Screen in the NUMBER OF LAYERS textbox (Fig. 19).

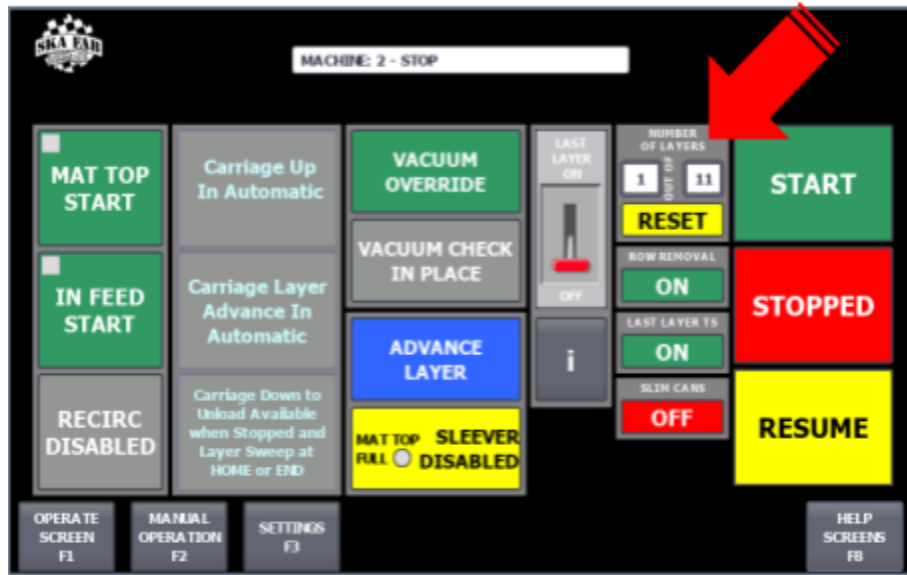


Fig. 19: HMI Screen – NUMBER OF LAYERS Textbox

6.1.3 Pallet Removal Sequence

1. Some operators prefer to place a tier sheet on the top of the completed pallet automatically; others prefer to manually place the top tier sheet outside of the machine to reduce cycle time. The LAST LAYER TS button on the Operate Screen, shown in Fig. 20, controls whether a tier sheet is placed on top of a completed pallet or not.

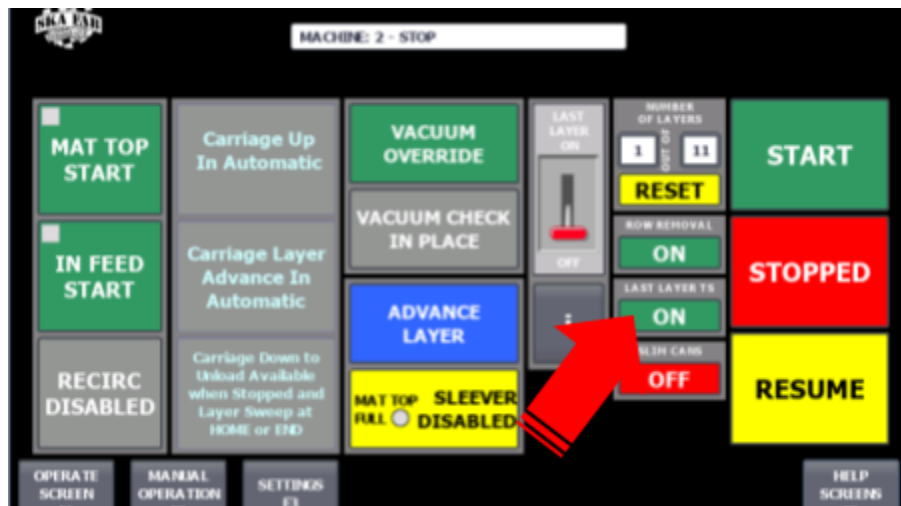


Fig. 20: HMI Screen – LAST LAYER TS Button

2. After the last layer has been swept onto the pallet, if the NUMBER OF LAYERS was not reached or the LAST LAYER toggle was not activated, stop the machine by pressing the STOP button. Then press the CARRIAGE DOWN TO UNLOAD button on the HMI (Fig. 21). The pallet will lower to the floor.

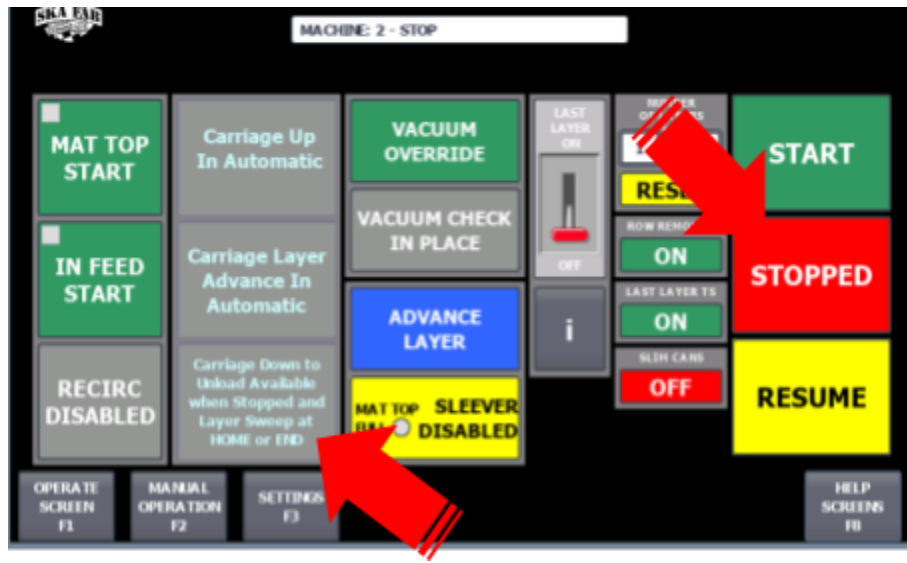


Fig. 21: HMI Screen – Stopped and CARRIAGE DOWN TO UNLOAD

3. Unlatch and open the Palletizer door.
4. Carefully remove the loaded pallet.
5. Repeat the steps above for each pallet.

6.2 Manual Operations

6.2.1 Manual Operation Menu

1. If manual control is required for any of the Palletizer components, press the MANUAL OPERATION button (Fig. 22) on the Operate Screen.

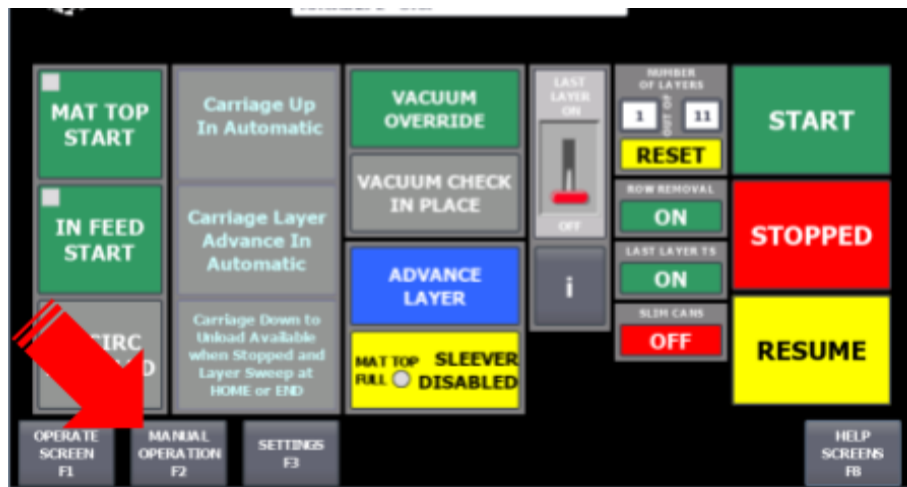


Fig. 22: HMI Screen – MANUAL OPERATION Button

You will be asked to verify that you want to take manual control (Fig. 24).

NOTE: Proceeding past this screen into the Manual Operation screens will remove the Palletizer from the Auto Sequence.



Fig. 23: HMI Screen – MANUAL OPERATION Verification

6.2.2 Manual Controls

1. The Layer Sweep can be manually jogged by holding the LEFT or RIGHT ARROW buttons (Fig. 24). The HOME button automatically returns the sweep to the home position. The STOP button interrupts a homing sequence. The UP/DOWN ARROW button raises and lowers the Layer Sweep.



Fig. 24: HMI Screen – Layer Sweep Manual Controls

2. Manually jog the Row Sweep by holding the UP or DOWN ARROW buttons shown in Fig. 25. The HOME button automatically returns the sweep to the home position. The STOP button interrupts a homing sequence. The ROW SWEEP ARM UP/DOWN ARROW button raises and lowers the Row Sweep.



Fig. 25: HMI Screen – Row Sweep Manual Controls

3. The Lift Carriage can be manually controlled by pressing the UP and DOWN ARROW buttons shown in Fig. 26.



Fig. 26: HMI Screen – Lift Carriage Manual Controls

4. The gray/green indicators next to each of the buttons serve as an I/O check, which can assist with troubleshooting. The indicator and their corresponding states are outlined in Table 6.

Table 6: I/O Indicators and Corresponding States

INDICATOR	GRAY	GREEN
SWEEP LEFT (End Prox or Home Prox Depending on HMI Location)	Sweep NOT AT End or Home Prox Sensor	Sweep AT End or Home Prox Sensor
SWEEP RIGHT (End Prox or Home Prox Depending on HMI Location)	Sweep NOT AT End or Home Prox Sensor	Sweep AT End or Home Prox Sensor
PALLET LIFT CARRIAGE TOP (Upper Limit Switch)	Pallet NOT AT Upper Limit	Pallet AT Upper Limit
PALLET LIFT CARRIAGE MIDDLE (Pallet Height Photo Eye)	Pallet Height Photo Eye blocked	Pallet Height Photo Eye NOT blocked
PALLET LIFT CARRIAGE BOTTOM (Lower Limit Switch)	Pallet NOT AT Lower Limit	Pallet AT Lower Limit
SWEEP ARM	Sweep Arm NOT DOWN	Sweep Arm DOWN
DEADPLATE	Deadplate NOT DOWN	Deadplate DOWN

6.2.3 Conveyance Manual Controls/Settings

The Mat Top and In Feed Conveyor speeds can be manually set from the Conveyance Settings screen shown in Fig. 27. Press a speed setpoint textbox to enter a new value. See [Section 8.5: Conveyance Settings](#) (Page 40) for more information on each speed setpoint. The current draw to each motor is also displayed here and can be used for troubleshooting purposes.

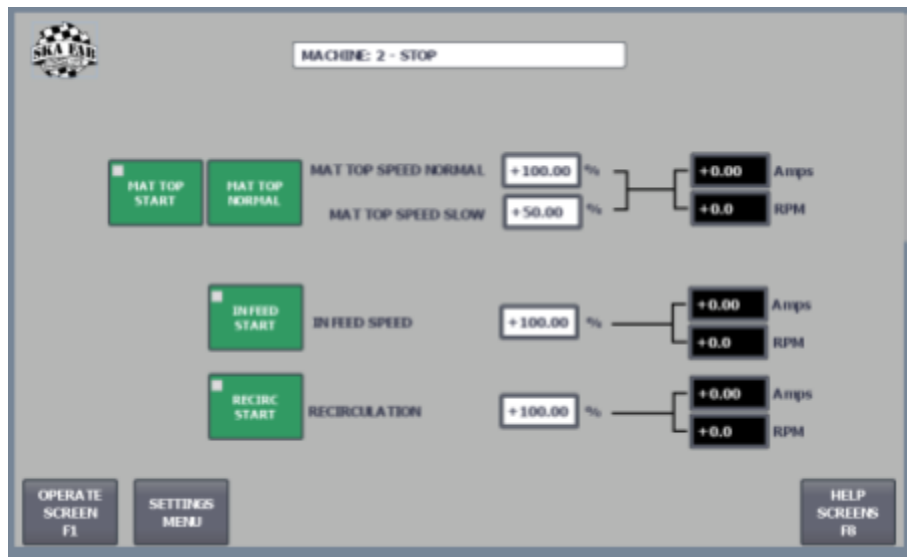


Fig. 27: HMI Screen – Conveyance Manual Controls/Settings

6.3 Help Screens

6.3.1 General Instructions

The following screens are included through the HMI to provide a brief outline of the operations sequence. The screens are provided for reference only and should not be used as a substitute for proper operator training and the guidelines outlined in this manual.

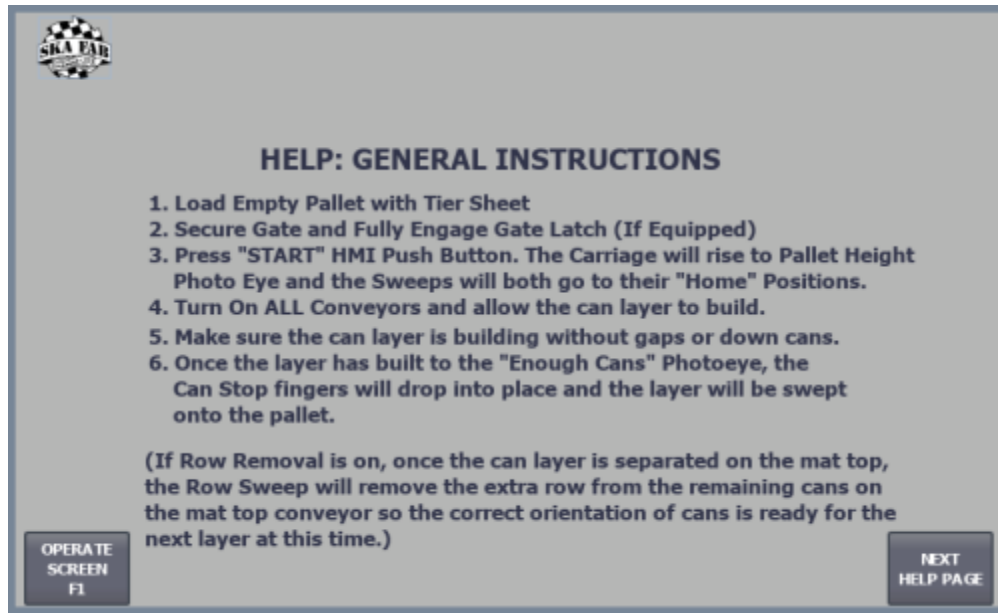


Fig. 28: HMI Screen – Help: General Instructions (Screen 1)

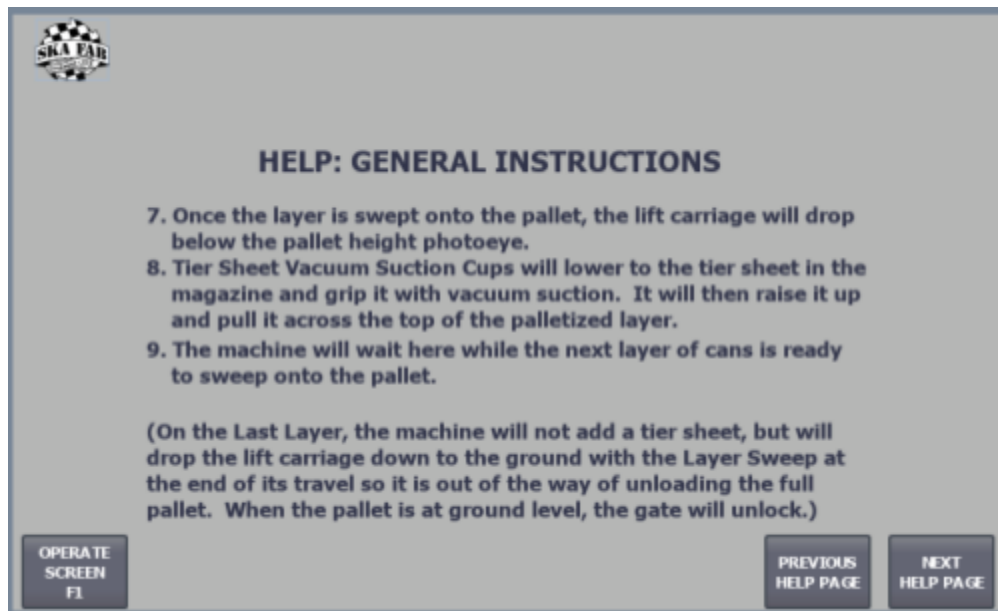


Fig. 29: HMI Screen – Help: General Instructions (Screen 2)



Fig. 30: HMI Screen – Help: Maintenance

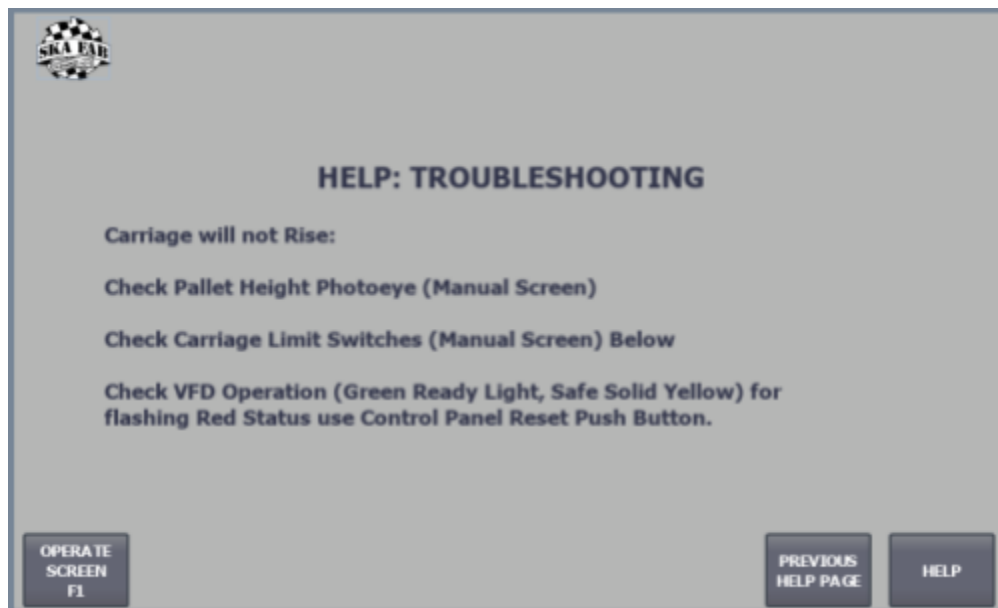


Fig. 31: HMI Screen – Help: Troubleshooting

7 Changeover Procedure

Changeover of the FAR Bulk Palletizer is only required for different can body diameters. No mechanical changeover is required to change over between different can sizes of the same body diameter. However, for can height changes, it will likely be necessary to change the Layer Count Setpoint.

7.1 Pop-up Deadplate Changeover

1. Loosen the ValuGuide Rails by turning the four black knobs on each side and slide the Rails away from the center of the Conveyor.
2. In Manual Mode on the HMI, press the DEADPLATE UP/DOWN ARROW button (Fig. 39) to raise the Pop-up Deadplate.



Fig. 32: HMI Screen – Deadplate raised

3. Using a 5/32" Allen Key, remove the Pop-up Deadplate (Fig. 33).



Fig. 33: Pop-up Deadplate Removal

4. Using a 5/32" Allen Key, remove the Fixed Deadplate (Fig. 34).



Fig. 34: Fixed Deadplate Removal

5. Reverse Steps 1-3 to install the correct Fixed Deadplate, followed by the correct Pop-up Deadplate, for the desired can size. Tighten hardware until it is finger tight.
6. In Manual Mode on the HMI, press the DEADPLATE UP/DOWN ARROW button to lower the Pop-up Deadplate. Visually inspect alignment with the Fixed Deadplate. Adjust as necessary to avoid contact spots that may prevent the Pop-up Deadplate from rising freely.
7. Use the DEADPLATE UP/DOWN ARROW button to raise the Pop-up Deadplate and finish tightening the hardware.
8. Raise and lower the Pop-up Deadplate several times. Make adjustments as necessary to ensure the Deadplate raises and lowers freely.

7.2 Can Stop Pin Rail Rough-In

1. In Manual Mode on the HMI, press the CAN STOP 1 UP/DOWN ARROW button (Fig. 35) to lower Can Stop 1.



Fig. 35: HMI Screen – Can Stop 1 raised

2. Pull up the pins holding the Can Stop 1 Pin Rail in place and turn them 90 degrees to keep them in the “up” position. Remove the current Can Stop 1 Pin Rail (Fig. 36).

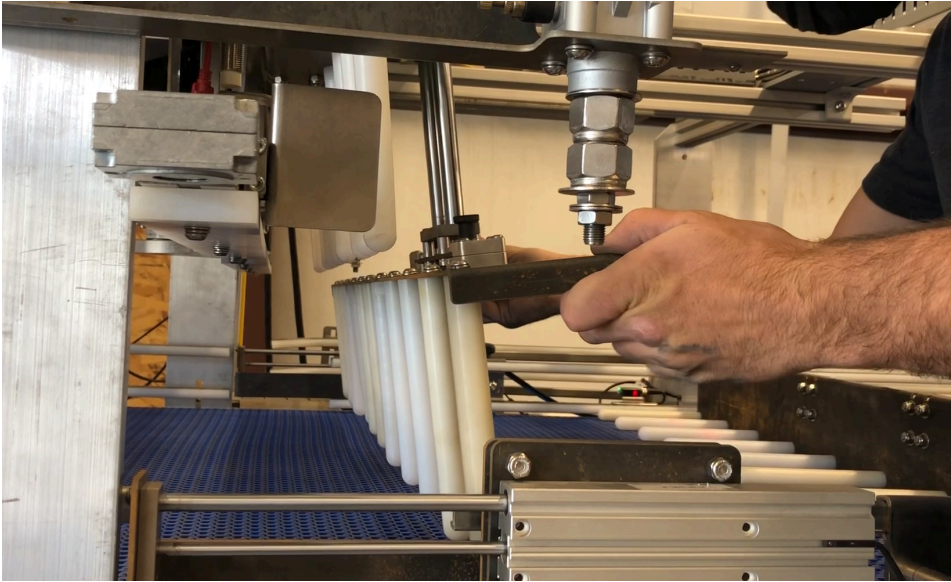


Fig. 36: Can Stop 1 removal

3. Install the correct Can Stop 1 Pin Rail for the required can diameter. The first time you run a can size, the positioning of the rails against the bracket may require small adjustments. Note: The slot spacing is different between Pin Rails for Can Stop 1 and Can Stop 2 to avoid accidentally installing them in the incorrect location.

- a. Ensure the pins face the correct direction as shown in Fig. 37.

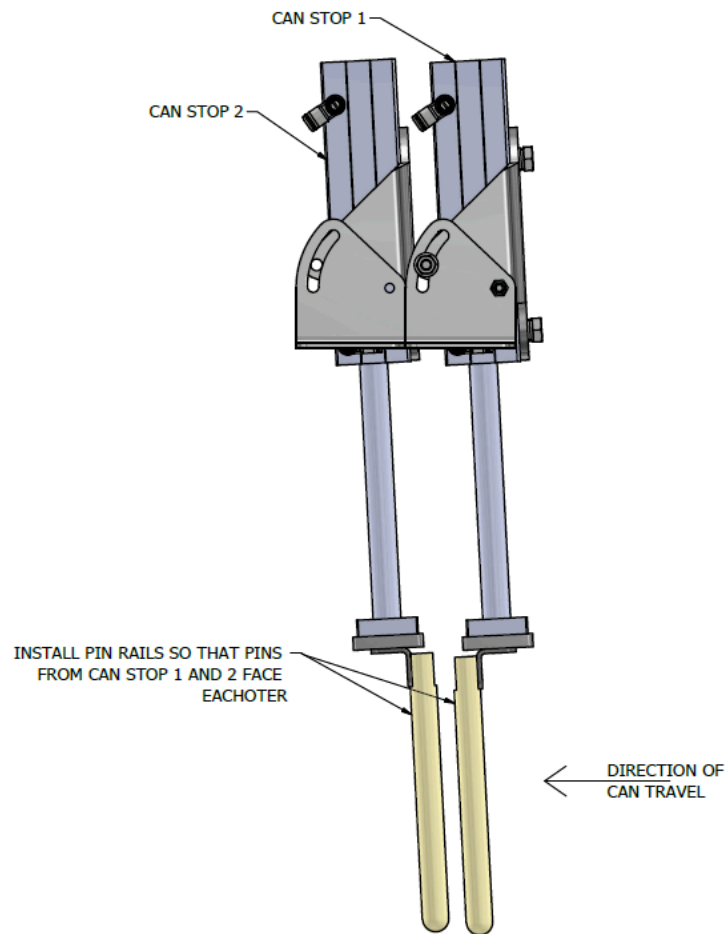


Fig. 37: Can Stop Pins Facing Correct Direction

4. In Manual Mode on the HMI, press the CAN STOP 1 UP/DOWN ARROW button to Raise Can Stop 1.
5. Repeat steps Steps 1-5 for Can Stop 2.

7.3 Guide Rail Width Changeover

1. In Manual Mode on the HMI, press the DEADPLATE UP/DOWN ARROW button (Fig. 38) to raise the Pop-up Deadplate.



Fig. 38: HMI Screen – Deadplate raised

2. Adjust the guide rails spacing using the ValuGuide Gauge.
 - a. Place the Gauge under the horizontal bar holding the ValuGuide Rail, as shown in Fig. 39. Choose the specific Gauge according to can size.

Table 7: Guide Rail Width and Conveyor Side Offset

CAN DIAMETER	GUIDE RAIL WIDTH (IN)	CONVEYOR SIDE OFFSET (IN)
Slim (202)	41 7/8	2 5/8
Sleek (204/207.5)	43 1/2	1 3/4
Standard (211)	43 1/4	1 7/8
Crawler (307)	43 1/4	1 7/8



Fig. 39: ValuGuide Rail position adjustment

- b. Pull the ValuGuide back until it pinches the Gauge between the ValuGuide mount and the barrel of the underside of one of the black knobs. Then, tighten the knob.
 - c. Repeat this step at each of the black knobs along the Guide Rails of the Conveyor and the Pallet Elevator.
 3. In Manual Mode on the HMI, turn on the Conveyor and run approximately 1½ layers of the new can size onto the Mat Top. There should be enough cans for the nested can pattern to extend beyond the Can Stop 1 and 2 Layer Separation Pins.
 4. Visually inspect the nested can pattern. Fine tune the rails as necessary.

7.4 Layer Sweep Wing Changeover

The nested pattern configuration for each can size will determine whether the layer sweep wings should be installed. Remove the Push Bar Wings indicated in Fig. 40 and 41 when running cans for which the layer pattern does not require odd row removal. For reference, Table 8 outlines whether odd row removal is required to achieve the industry standard pattern.

Table 8: Odd Row Removal Requirements

BODY DIAMETER	CAN VOLUME	ODD ROW REMOVAL REQUIRED?
211	8oz/12oz/16oz/19.2oz	YES
204	12oz Sleek	NO
207.5	12oz Sleek	YES
307	32oz Crowler	NO
202	187ml/250ml	YES

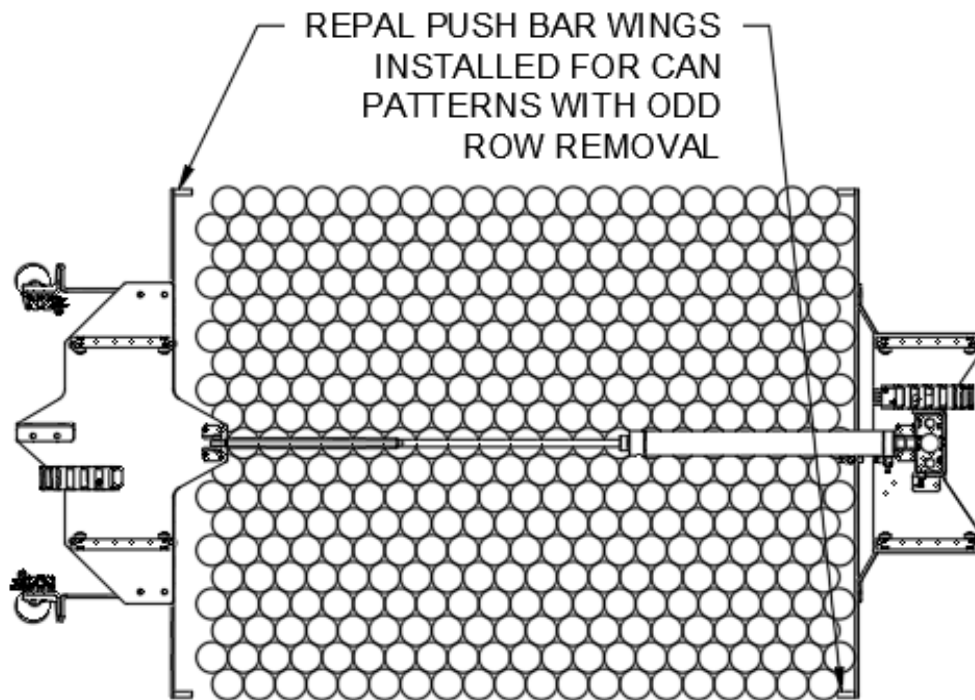


Fig. 40: Push Bar Wings Installed for Can Patterns with Odd Row Removal

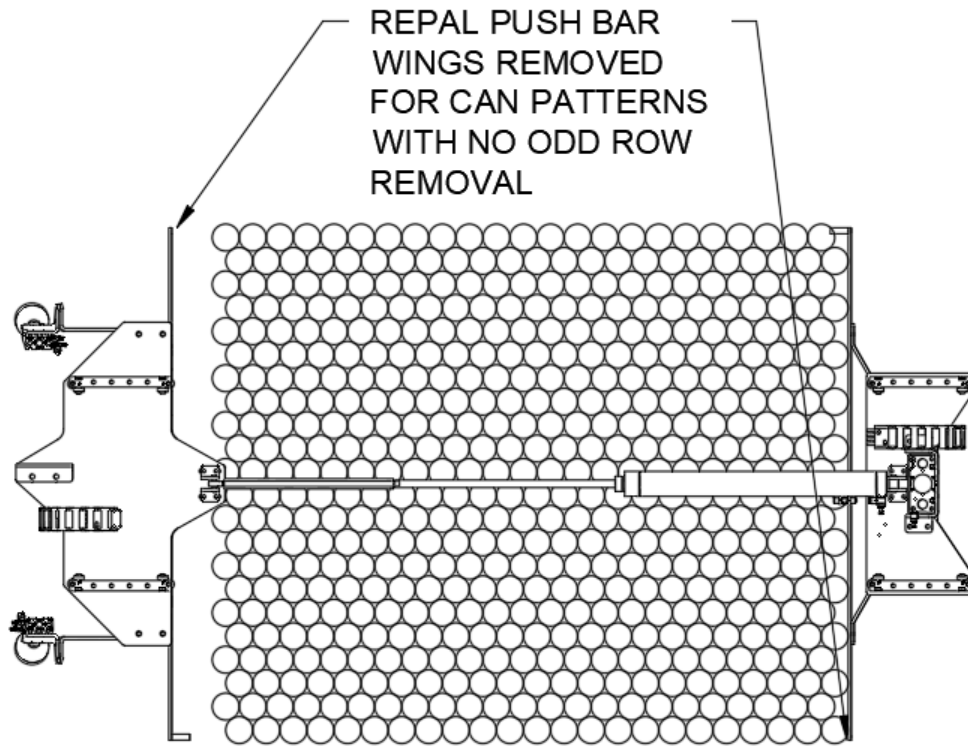


Fig. 41: Push Bar Wings Removed for Can Patterns with No Odd Row Removal

7.5 Can Stop Pin Rail Fine Tuning

1. Visually inspect the Can Stop 1 Pin alignment with the corresponding row of cans. If necessary, adjust the Pin Rail position with respect to the Piston Adapter so that the pins are generally centered above the can openings of the corresponding row.
2. In Manual Mode on the HMI, press the CAN STOP 1 UP/DOWN ARROW button to lower Can Stop 1.
3. With the pins inside the corresponding row of cans, make any fine-tune adjustments necessary so that as the pins enter the cans, the pins are centered in the can opening.
4. Using a 5/32" Allen Key, finish tightening the Can Stop 1 hardware.
5. Visually inspect the angle of Can Stop 1. The ideal angle is such that the pins pass through the center of the can diameter when they enter the can and just barely make contact with the inside of the can wall when fully extended. The ideal state is shown in Fig. 42.

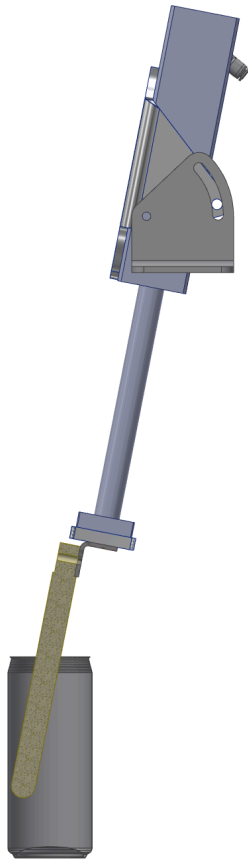


Fig. 42: Ideal Angle of Pins Inside Cans

6. If necessary, adjust the angle of Can Stop 1 so that its position is close to the ideal state shown in Fig. 42.
7. Repeat Steps 1-6 for Can Stop 2.

7.6 Adjusting HMI Settings

1. On the Operate Screen of the HMI, turn Odd Row Removal off or on depending on the can size being run. See Table 8 in "Section 7.4: Layer Sweep Wing Changeover" (Page 33) for reference.
2. Set the Number of Layers setpoint to the correct value for the can size/customer order.

8 Settings

8.1 Settings Menu

1. To access the Palletizer Settings screens, Press the SETTINGS button on the Operate Screen.

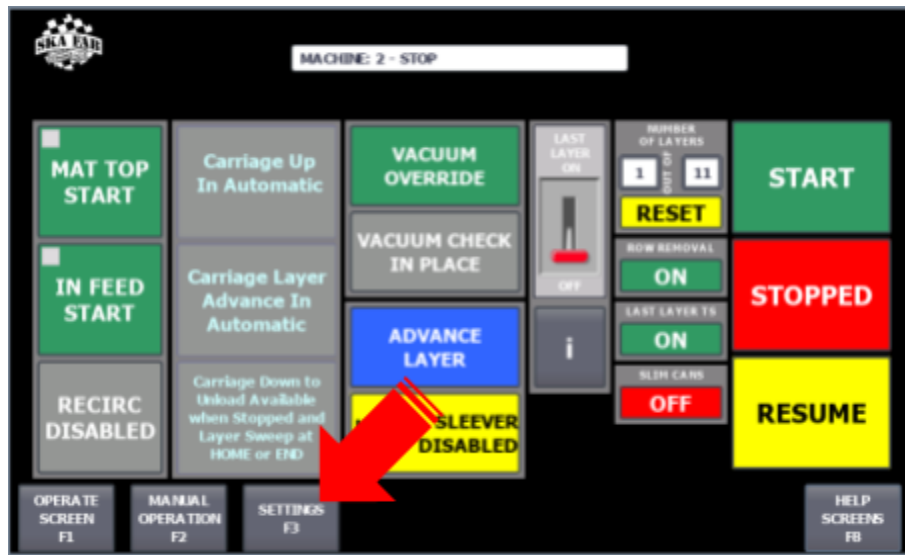


Fig. 43: HMI Screen – SETTINGS Button

2. Select the appropriate FAR component from the SETTINGS menu below.

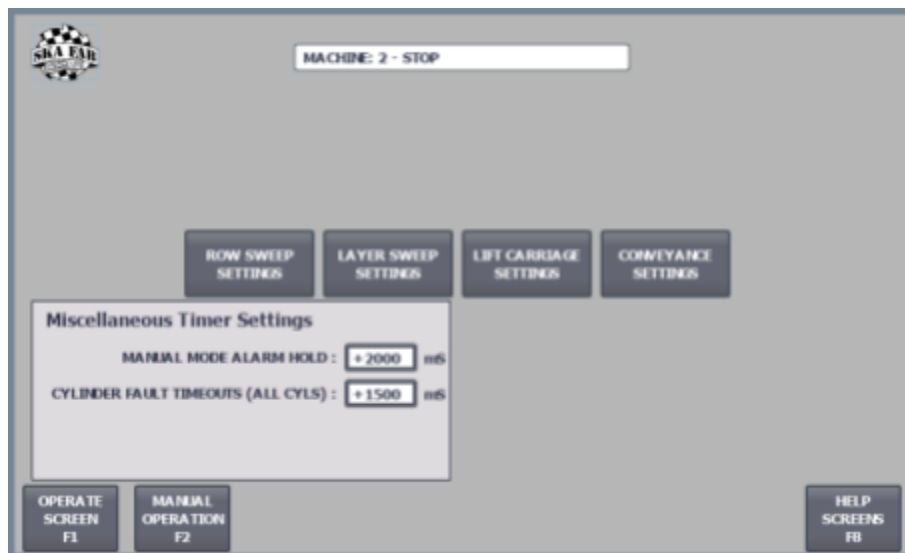


Fig. 44: HMI Screen – Full Auto Palletizer Settings Options

8.2 Layer Sweep Settings

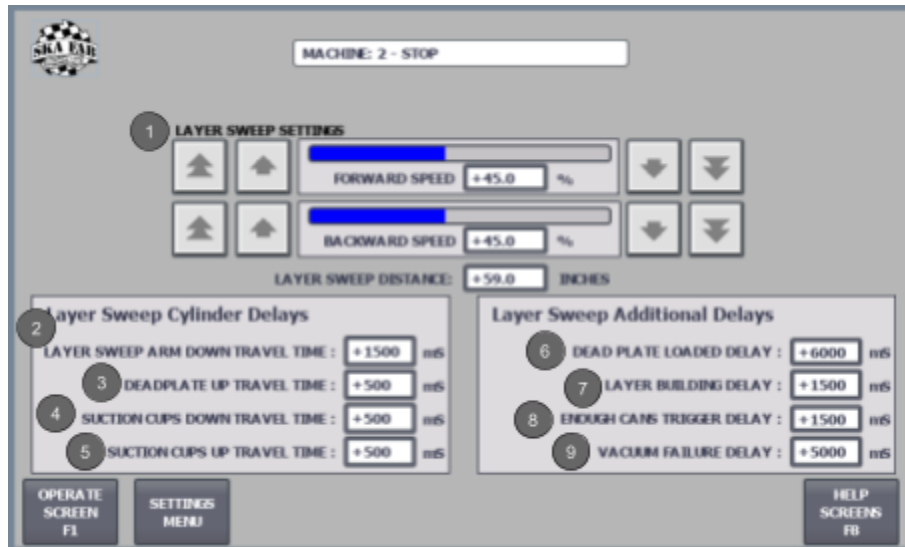


Fig. 45: HMI Screen – Layer Sweep Settings

1. Layer Sweep Settings – The sweep Forward and Backward Speed can be set either by pressing the UP and DOWN ARROW buttons or by directly entering a numerical setpoint in the text box by selecting the current value.
2. Layer Sweep Arm Down Travel Time – This timer controls how long the sequence waits to allow the Layer Sweep Arm to travel and reach the fully extended position. The proper setpoint can be impacted by available air pressure and flow control valve settings on the Layer Sweep Arm Piston. This Setting should be dialed in during installation and commissioning.
3. Deadplate Up Travel Time – This timer controls how long the machine waits for the Deadplate to raise before moving on in the sequence after raising the Deadplate.
4. Suction Cups Down Travel Time – This timer controls how long the machine waits for the suction cups to travel down before moving on in the sequence after extending the suction cups.
5. Suction Cups Up Travel Time – This timer controls how long the machine waits for the suction cups to travel up before moving on in the sequence after retracting the suction cups.
6. Deadplate Loaded Delay – This timer controls how long the machine must see that the Deadplate Primed Photo Eye Sensor is blocked before it accepts

that the Deadplate is primed. This prevents a momentary trigger of the Photo Eye from making the machine think that the Deadplate is primed.

7. Layer Building Delay – This timer controls how long the machine must see that the Clear To Lower Sweep Arm Photo Eye is blocked before it accepts that the layer is building. This prevents a momentary trigger of the Photo Eye from making the machine think that the layer is building.
8. Enough Cans Trigger Delay – This timer controls how long the machine must see that the Enough Cans Photo Eye Sensor is blocked before it advances the sequence after both of the previous timers have completed. This prevents a momentary trigger of the Photo Eye (such as a single can traveling down the Conveyor) from making the machine think that the Deadplate is primed.
9. Vacuum Failure Delay – This timer controls how long the machine waits to achieve vacuum while attempting to pick up a tier sheet before it issues the “VACUUM NOT ACHIEVED” fault.

8.3 Row Sweep Settings



Fig. 46: HMI Screen – Row Sweep Settings

1. Row Sweep Settings – The Sweep Forward and Backward Speed can be set either by pressing the UP and DOWN ARROW buttons or by directly entering a numerical setpoint in the text box by selecting the current value.

2. Row Sweep Gate Close Delay – The gates that the Row Sweep lowers into close after the Row Sweep rises. This timer controls the amount of time that the gates wait before closing to ensure that the Row Sweep is out of the way.
3. CS2 to Sweep Can Settle Delay – After releasing a row of cans to the row sweep during the Odd Row Removal Sequence (Page 16), Can Stop 2 lowers again. This timer controls the amount of time the machine waits for those released cans to be conveyed against the row sweep before they are swept onto the Recirc Conveyor.

8.4 Lift Carriage Settings

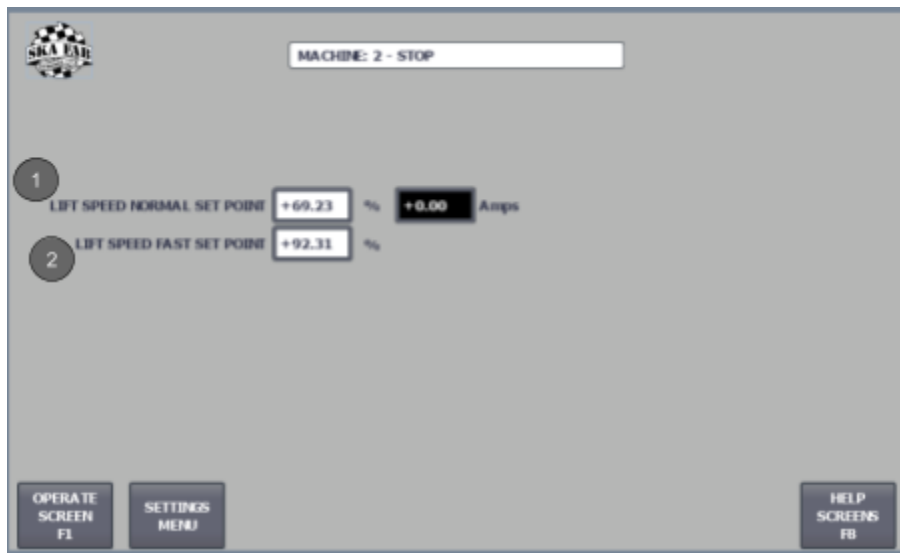


Fig. 47: HMI Screen – Lift Carriage Settings

1. Lift Speed Normal Setpoint – This setpoint controls how fast the Pallet Lift Carriage will travel during normal movements up and down, when a pallet is first loaded, and during Pallet Lift Carriage movements between layers.
2. Lift Speed Fast Setpoint – The setpoint controls how fast the Pallet Lift Carriage will travel in the down direction once the CARRIAGE DOWN TO UNLOAD button has been pressed.

8.5 Conveyance Settings

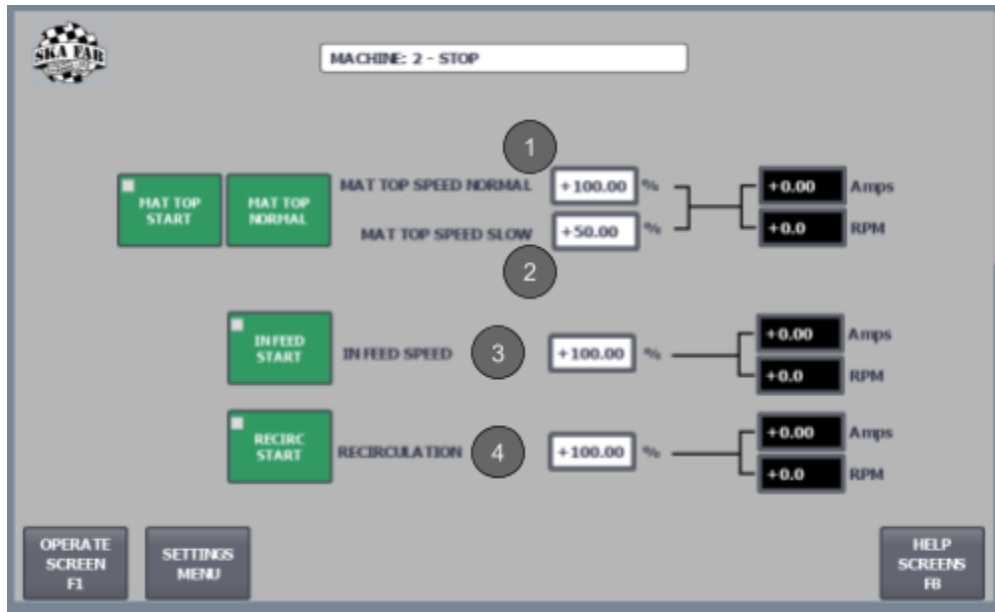


Fig. 48: HMI Screen – Conveyance Settings

1. Mat Top Speed Normal – This setpoint controls the Mat Top Conveyor speed during the majority of the palletizing sequence and can be manually set from this screen. Click on the speed setpoint textbox to enter a new value. The current draw to each motor is also displayed here and can be used for troubleshooting purposes.
2. Mat Top Speed Slow – This setpoint controls the Mat Top Conveyor speed during certain steps of the Odd Row Removal Sequence. Click on the speed setpoint textbox to enter a new value.
3. In Feed Speed – The IN FEED Conveyor speed can be manually set from this screen. Click on the speed setpoint textbox to enter a new value.
4. Recirculation – The Recirc Conveyor speed can be manually set from this screen. Click on the speed setpoint textbox to enter a new value.

9 Maintenance

1. Inspection: Visually inspect the machine daily before the start of each run. Inspect for missing/loose parts, damage, wear. Pay particular attention to ensure that all machine guards/covers are in place prior to operation.
2. Cleaning: Keeping your equipment clean is essential for proper operation and longevity. A build-up of dirt, grease, oil, and debris can also help to identify potential issues, such as components nearing the end of life, during visual inspection.
 - a. Cleaning frequency and requirements for the equipment are primarily driven by the operating environment and operating company's requirements. When cleaning is required, warm, soapy water is sufficient to meet most cleaning requirements. Should the use of other cleaning chemicals be required/desired, the operating company is responsible for reviewing cleaning agent material compatibility prior to use on machines. Read and follow all instructions before use including required Personal Protective Equipment.
 - b. Standard FAR Bulk Palletizer equipment includes a combination of powder coated mild steel, stainless steel, aluminum, and UHMW polyethylene materials. DO NOT use caustic (sodium hydroxide) to clean your equipment. Caustic is not compatible with aluminum components and may cause irreversible damage to your equipment. Similarly, harsh solvents can damage powder coatings and should not be used.
 - c. Cleaning agents, including soapy water, should be applied locally, by hand, with a brush or rag. The standard FAR is NOT washdown duty rated. DO NOT power wash, hose down, foam, or steam clean equipment unless it has been explicitly designed for such exposure.
 - d. Once clean, equipment should be rinsed with water and dried to remove any cleaning agent residue. Re-lubricate any parts requiring lubrication.
3. Lubricate chains, sprockets, turnbuckles, and columns using a lithium-based aerosol grease. We recommend Loctite LB8529. Apply lubrication to the chains and inside of the columns every 500 operating hours or every three months, whichever comes first. Using an incorrect grease or over/under lubricating the chains can cause lift jams.
 - a. For longer service life, the gearbox should be periodically drained (preferably while warm) and refilled to the proper level with a recommended gear oil.

Gearboxes are shipped with Mobile synthetic oil. Synthetic lubricant should be changed every 6,000 hours of operation or every two years, whichever comes first.

4. Lubricate pillow block bearings using a grease gun to fill the grease fitting shown in Fig. 49. We recommend Loctite LB 8104 Food Grade Grease. Apply grease until it is just barely visible out the side of the bearing. If more is applied, wipe it away so that it doesn't collect dust or debris.



Fig. 49: Pillow Block Bearing with grease fitting

5. Inspect pneumatic air lines and cables for signs of wear or damage. Replace as needed.
6. Hardware: Inspect all hardware on the Palletizer and Conveyor every three months and tighten or replace if necessary.
7. Air Prep: Moisture extracted from the service air will collect in the filter bowl. Environmental conditions and plant air quality will have an impact on the required drain interval. Monitor and drain periodically to determine the proper inspection interval for your conditions.
 - a. Filter element lifecycle will depend on plant air quality. Replace the filter element if a loss of sufficient flow rate is observed or every three to six months.
8. Sweep Bearings: Inspect the bearings on the Sweep Carriage for wear once every year, and replace if necessary.

10 Troubleshooting

10.1 Alarm List

Table 9: Alarms and Typical Causes

ALARM	TYPICAL CAUSE
LAYER SWEEP AT FRONT LIMIT	The Layer Sweep is already at the Front Limit PROX, but the operator is trying to jog it forward.
LAYER SWEEP AT BACK LIMIT	The Layer Sweep is already at the Back Limit PROX, but the operator is trying to jog it backward.
LAYER SWEEP ALREADY HOME	The Layer Sweep is already at the Home PROX, but the operator is trying to home it.
LAYER SWEEP LOWER DEADPLATE TO LOWER ARM	The Deadplate is raised and the operator is trying to lower the Layer Sweep Arm. The Deadplate must be lowered to lower the Layer Sweep Arm.
LAYER SWEEP MAT TOP NOT CLEAR TO LOWER ARM	The Lower Layer Sweep Arm Photo Eye must see the reflector across the Mat Top Conveyor in order for the Layer Sweep Arm to be lowered.
LAYER SWEEP RAISE ARM TO RAISE DEADPLATE	The Layer Sweep Arm is lowered and the operator is trying to raise the Deadplate. The Layer Sweep Arm must be raised to raise the Deadplate.
LAYER SWEEP EXPAND CYLINDER FAILED	The Layer Sweep Expand Cylinder failed to expand or retract within the time allotted by the fault timer setpoint.
LAYER SWEEP ARM CYLINDER FAILED	The Layer Sweep Arm Cylinder failed to expand or retract to the upper position sensor within the time allotted by the fault timer setpoint.
PALLET LIFT CARRIAGE AT UPPER LIMIT	The Pallet Lift Carriage is already at the Upper Limit Switch, but the operator is trying to raise it further.

Table 10: Alarms and Typical Causes (Part 2)

ALARM	TYPICAL CAUSE
PALLET LIFT CARRIAGE CAN HEIGHT PHOTO EYE BLOCKED	The Pallet is already blocking the Height Photoeye, but the operator is trying to raise the Pallet Lift Carriage further.
PALLET LIFT CARRIAGE SWEEP NOT HOME OR AT END	The Layer Sweep must be on the Home PROX or on the End PROX in order to raise the Pallet Lift Carriage.
PALLET LIFT CARRIAGE AT LOWER LIMIT	The Pallet Lift Carriage is already at the Lower Limit Switch, but the operator is trying to lower it.
PALLET LIFT CARRIAGE VFD FAULTED	The Pallet Lift Carriage VFD has an internal Fault. (Press Reset to Clear.)
PALLET LIFT CARRIAGE VFD OFFLINE	The Pallet Lift Carriage VFD is not communicating with the PLC. (Press Reset to Retry.)
PALLET LIFT CARRIAGE VFD SAFE OFF	The Pallet Lift Carriage VFD is in Safe Torque Off Mode. This is typically caused by the safety gate not being latched. The Pallet Lift Carriage won't operate in this mode.
CONVEYOR VFD OFFLINE	The Mat Top Conveyor VFD is not communicating with the PLC. (Press Reset to Retry.)
LAYER SWEEP HOMING ERROR	The Layer Sweep failed to home itself when requested. Press Reset and try again.
VACUUM NOT ACHIEVED	When Vacuum Suction is activated, the pressure switch must verify that proper suction is achieved, if the pressure is out of range, vacuum will not be achieved.
VACUUM LOST	Once Vacuum Suction is activated, the pressure switch verifies that proper suction is achieved. Once it is achieved, if the pressure goes out of range, vacuum pressure is lost.

Table 11: Alarms and Typical Causes (Part 3)

ALARM	TYPICAL CAUSE
DEADPLATE CYLINDER FAILED	The Deadplate Cylinder failed to expand or retract to the lower position sensor within the time allotted by the Fault Timer setpoint.
SUCTION CUP CYLINDER FAILED	The Suction Cup Cylinder failed to expand or retract within the time allotted by the Fault Timer setpoint.
CONVEYOR VFD FAULTED	The Mat Top Conveyor VFD has an internal Fault. (Press Reset to Clear.)
IN FEED VFD FAULTED	The In Feed Conveyor VFD has an internal Fault. (Press Reset to Clear.)
IN FEED VFD OFFLINE	The In Feed Conveyor VFD is not communicating with the PLC. (Press Reset to Retry.)
RECIRCULATION VFD FAULTED	The Recirculation Conveyor VFD has an internal Fault. (Press Reset to Clear.)
RECIRCULATION VFD OFFLINE	The Recirculation Conveyor VFD is not communicating with the PLC. (Press Reset to Retry.)
ROW SWEEP ALREADY AT FRONT LIMIT	The Row Sweep is already at the Front Limit PROX, but the operator is trying to jog it forward.
ROW SWEEP ALREADY AT REAR LIMIT	The Row Sweep is already at the Rear Limit PROX, but the operator is trying to jog it backward.
ROW SWEEP ALREADY HOME	The Row Sweep is already on the Home PROX, but the operator is trying to home it.

11 Contact Us

For help from our dedicated support team, please email Technical Support at support@skafabricating.com or call (970) 426-4707.

Our U.S. office hours are 8:00 a.m. to 5:00 p.m. (Mountain Time) Monday through Thursday and 8:00 a.m. to noon Friday.

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