This manual covers the following machine:

Model 2500 Series Seed Counters

2500S

2500E

Year Manufactured: _____2008_____.

Serial No.:_____.

Voltage/Hz:_____.

Amperage:_____.

DuBois
Engineering Company

INTRODUCTION.

This manual covers how to set up and operate the DuBois Model 2500 Series Seed Counters.

Observe all safety precautions. Refer to safety instructions beginning on page 5.

Refer to paragraphs 1.2 and 2.1 for a description of the machine and its intended use.

The term "Indexer" and "Carousel" are interchangeable and are both used to refer to the envelope filler mechanism.

Units and numerical values in this manual.

Numerical values for measurements, such as size and mass, are shown in this manual according to the international system of metric units (SI). When appropriate, equivalent inch/pound units are shown in parentheses immediately following the metric units.

To denote a decimal point, a dot (.) has been used throughout this manual for both metric and non-metric measurements.

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1. SAFETY INSTRUCTIONS

1.1 Safety guidelines.

1. Supervising, operating, cleaning and maintenance personnel must read this manual before installing, operating, cleaning, or maintaining the machine. The supervisor is responsible for ensuring that all these personnel have read and understood this manual.

2. The operator must verify at the start of each day that all safety features of the machine are working properly (refer to paragraph 1.2.4 for testing guidelines). Report malfunctions to the supervisor immediately.

3. The supervisor must give clear instructions that defective safety devices must be repaired immediately, and that the machine must not be operated with defective safety devices.

4. The supervisor will only allow operation, cleaning, or maintenance on the machine by trained personnel. Training must be repeated regularly, for example, twice each year.

5. The supervisor must give clear instructions that all safety procedures described in this manual must be followed by operating personnel.

6. Make sure the flow control air valve for clean out cycle is set slow enough that the machine will meet airborne noise requirements (see page 58).

7. The original design of the machine may not be altered. Use only genuine DuBois Engineering repair parts, and use them only as intended.

8. The supervisor must ensure that at least once each year the safety devices of the machine are confirmed to be in good condition and proper working order.

9. This instruction manual must accompany the machine whenever the machine is resold or relocated.

1.2 Safety data sheet.

1.2.1 Machine overview.
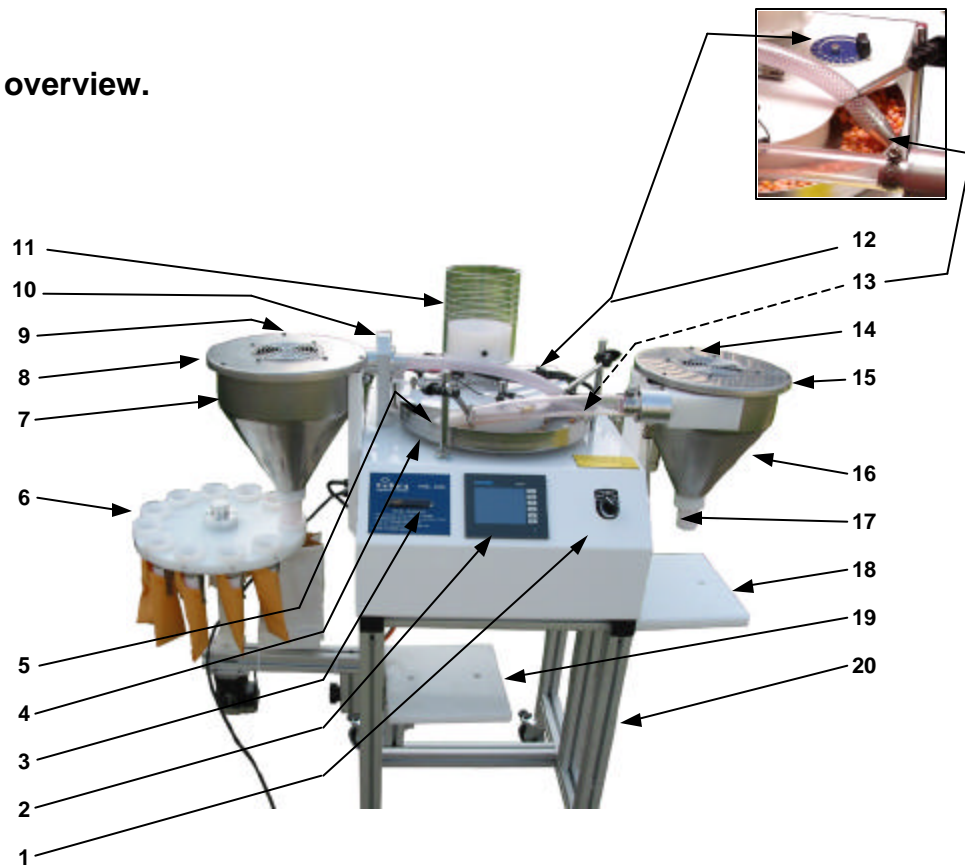
DuBois Model 2500 Series Seed Counter (with carousel shown)

1. Power switch (S1)
2. Control panel
3. Sensitivity control
4. Seed tray
5. Cleanout nozzle
6. Envelope carousel
7. Count funnel
8. Safety cover
9. Screw
10. Housing, count sensor

11. Input hopper
12. Control knob for fishtail partition
13. Count nozzle
14. Screw
15. Safety cover
16. Cleanout funnel
17. Reflective tape
18. Support, cleanout container
19. Support, scale
20. Stand

1.2.2 Guarding devices.

1.2.2.1 Top cover on count funnel.

Hazard: Seeds are moving at high speed, and could cause eye injury.

Safety solution: A cover fits over the top of the count funnel to ensure the seeds will only travel out the bottom of the count funnel. The cover fits snugly over the top of the count funnel, and has sides that keep the cover centered over the count hopper, preventing seeds from escaping from the seam where the cover joins the count hopper. Screws retain the cover in place, and prevent air pressure from lifting the cover. A tool is required to remove the screws.

Instructions: Always install the cover on top of the count funnel before running the machine. Always tighten the screws retaining the cover in position. Always use only the original cover, and assure that the cover is in original condition, and fits snugly over the top of the count funnel.

As an added precaution, the operator must wear eye protection when operating the machine. The machine must also be located where other people are not at risk for eye injury. Refer to installation instructions on page 10.

1.2.2.2 Top cover on cleanout funnel.

Hazard: Seeds are moving at high speed, and could cause eye injury.

Safety solution: A cover fits over the top of the cleanout funnel to ensure the seeds will only travel out the bottom of the cleanout funnel. The cover fits snugly over the top of the cleanout funnel, and has sides that keep the cover centered over the cleanout funnel, preventing seeds from escaping from the seam where the cover joins the cleanout funnel. Screws retain the cover in place, and prevent air pressure from lifting the cover. A tool is required to remove the screws.

Instructions: Always install the cover on top of the cleanout funnel before running the machine. Always tighten the screws retaining the cover in position. Always use only the original cover, and assure that the cover is in original condition, and fits snugly over the top of the count funnel.

As an added precaution, the operator must wear eye protection when operating the machine. The machine must also be located where other people are not at risk for eye injury. Refer to installation instructions on page 10.

1.2.3 Electrical system.

1.2.3.1 Stop switch.

There is no situation arising from the use of this machine that requires an emergency stop switch. The power switch (S1) of the machine is easily accessible from the operator's position.

1.2.3.2 Power switch (S1).

Rotate the knob clockwise to turn power on. Rotate the knob counterclockwise to turn power off.

1.2.3.3 Main drive housing.

The electrical elements have been incorporated into the main drive housing, where they are protected against fluids, such as cleaning agents, sanitation agents, and cleaning water.

1.2.4 Functional test.

1.2.4.1 Testing steps to do before daily startup of the machine.

1. Make sure that all safety equipment and safety features are in good condition. Refer to safety instructions beginning on page 5.

   - Top cover must be installed on the count funnel, and the retaining screws must be tight.

   - Top cover must be installed on the cleanout funnel, and the retaining screws must be tight.

   - The operator must always wear eye protection.

2. If the envelope carousel is not installed, the machine will not run a count cycle unless a container is in position to receive the output of the count funnel (if photo sensor is enabled).

3. The machine will not run a cleanout cycle unless a container is in position to receive the output of the cleanout funnel (if photo sensor is enabled).

Attention: If the machine does not perform as described above, do not continue operating the machine. Immediately stop operation, and notify your supervisor of the need for repair of the machine.

2. OPERATING INSTRUCTIONS

2.1 Machine description and intended use.

The DuBois Model 2500 Series Seed Counter is a high speed, precision device designed for counting plant seeds that are roughly consistent in size and shape. The machine may be adjusted to count various types of seeds, but is only intended to count one type of seed at a time.

An optional envelope carousel may be installed to automatically fill as many as ten envelopes at a time. In place of the envelope carousel, an optional scale may be installed to automatically evaluate the weight of the seeds being counted. If desired, the machine may run without either of these options, and can then fill one envelope at a time.

The machine can count many different kinds of seeds, ranging from small seeds like sorghum seeds, to large seeds like sunflower seeds.

The machine is not suitable for counting large nuts, or seeds that are unusually heavy and dense. Heavy or metallic objects must never enter the counting mechanism.

The machine can count a thousand seeds in a matter of seconds. Smaller seeds can be counted faster than larger seeds. Greater precision requires slower speeds, which allows fewer seeds to be added after the target count has been reached.

2.2 Installation.

1. Locate the machine is a suitable work area, where the operator will have comfortable access to the equipment and its controls.

Attention: Lift the machine <u>only</u> by grasping underneath the main cabinet. Two people are required to safely lift the machine safely. <u>Do not</u> grasp the count funnel or cleanout funnel or input hopper to move or position the machine.

2. To provide maximum safety from the risk of eye injury due to seeds moving at high speed, locate the machine away from people who will not be involved in its operation. As an alternate to an isolated location, partitions or barriers may also provide protection for people who are nearby. In the event of accidental mismanagement of the safety covers by the operator, or in the event of damage or malfunction of the safety covers, this protective location may provide safety for people who are nearby.

3. Make sure the machine is level. Make sure the table supporting the Seed Counter is locked in a stable position.

4. Your machine may have different options installed, depending on the model. Model 2500E has the envelope carousel installed. Model 2500S does not have the envelope carousel, but may be installed with communications for using the scale features.

5. If the same quantity of seeds are to be filled in each envelope more than ten envelopes can be filled per batch. If different counts are to be filled in each carousel position, then the quantity envelopes are limited to ten.

6. The standard configuration fills one envelope at a time (without the carousel, start button initiates each count cycle).

7. Make sure all required electrical connections have been made for the options that you are using.

8. Provide for electrical and pneumatic utilities to the machine. Refer to page 58 for specifications.

2.3 Operator adjustments.

2.3.1 Count nozzle size.

Select the proper size nozzle to suit the size of the seeds you will be counting. The opening in the nozzle should be approximately 3 mm (1/8 inch) bigger than the largest dimension of the seeds that will be counted.

2.3.2 Fishtail partition.

Turn the control knob (1) to adjust the position of the fishtail partition so that the seeds are divided into two streams, with the stream nearest the outside of the seed tray being approximately 20 mm (3/4 inch) wide. Tighten the thumbscrew on the control knob to retain the position. Make this adjustment while the tray is turning and has seeds in it.
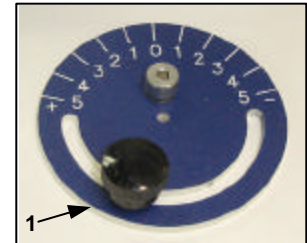
2.3.3 Count nozzle position.

Locate the count nozzle (2) so that it lightly skims the top of the outer stream of the specific seeds to be counted, and is close to the outer rim of the tray but does not touch the rim.
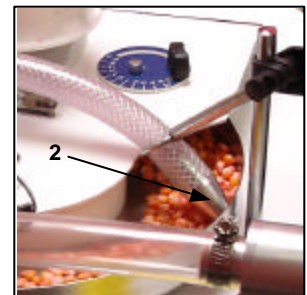
2.3.4 Cleanout nozzle position.

Locate the cleanout nozzle so that it is high enough to not block the flow of seeds under it, and does not touch the outer rim of the tray, nor touch the downstream baffle when the baffle moves to its actuated position to block the stream of seeds. Use the manual mode (see paragraph 2.5.15) to check for possible interference between the cleanout nozzle and the downstream baffle.

2.3.5 Sensitivity adjustment – manual type

Your machine may have manual type sensitivity adjustment, which requires that you set sensitivity for the specific size seed you will be counting. Some machines have automatic sensitivity adjustment, which means that the machine automatically calibrates for the basic size of the seed, but you still have to define the margin above that basic sensitivity to determine what the machine sees and counts (see paragraph 2.3.6).

Attention: **The sensitivity control of the photoelectric sensor is critical to reliable operation. Set sensitivity to recognize one individual seed of the type of seeds that will be counted. Each time you change the type of seeds that you are counting, you will want to reset the sensitivity if the new seeds are a different size.**

If your machine has manual type sensitivity, follow the procedure shown below:

1. Measure the smallest seed to be counted. Locate a wire of equal diameter to this measurement. Cut a piece of the wire at least 50 mm (2 inches) long.

2. Turn the power switch (S1) on.

3. Remove the suction tube from the inlet of the sensor housing.

4. Open the cover on the sensitivity control.

5. Press and hold the static (-) button on the sensitivity control until the display shows "1st," and the arrow icon turns red. Release the button.

6. While the display is still showing "1st," insert the wire (prepared in step 1 above) into the sensor passageway, and then click the static (-) button. Remove the wire. When the display shows "2nd," click the static (-) button again. The display will show "Pass" if the signal was received properly. The sensor will then return to run mode with the new settings, and the arrow icon will turn green.

Note: If there was a problem, the display will show "Fail," and the procedure must be repeated, starting with step 5 above.

7. If desired, you may adjust the target value in small increments by pressing the dynamic (+) or static (-) buttons individually on the sensitivity control.

8. Close the cover on the sensitivity control.

Attention: **The sensitivity control has several optional features not being used by this application. The above procedure is all you will need to do to operate the machine, but if you accidentally alter the default settings of the sensitivity control, the machine may not function as intended. If you suspect that you may have accidentally altered the factory setup of the sensitivity control, refer to page 59 to return the device to its original factory condition. After that you will still need to do the sensitivity adjustment described above.**

2.3.6 Sensitivity adjustment – automatic type

Your machine may have an automatic type sensitivity adjustment, which means that the machine will automatically set a baseline value for the seeds that the machine is counting, and will automatically compensate for changes in visibility through the lens. With this type adjustment, however, you still need to define a plus margin for what the machine will use to interpret when a seed has been seen. Increase the margin if the machine is undercounting a test sample (meaning the machine is failing to see all the seeds due to the sensitivity being too low). Decrease the margin if the machine is reporting more seeds than the test sample has (meaning the machine is too quick to interpret a signal as being a seed).

Attention: **The sensitivity control of the photoelectric sensor is critical to reliable operation. Set sensitivity to recognize one individual seed of the type of seeds that will be counted. Any time you dramatically change the size of seeds that you are counting, you may want to reset the sensitivity.**

If your machine has automatic type sensitivity, follow the procedure shown below:

1. Turn the power switch (S1) on.

2. Run a test sample of seeds to allow the machine to set an automatic baseline.

3. Open the cover on the sensitivity control module.

4. As needed, press the + or – buttons to set the margin value.

5. If the reported count of a test sample is low, press the + button to increase the margin value.

6. If the reported count of a test sample is high, press the – button to decrease the margin value.

7. Once performance has become accurate, variations in baseline adjustments will not affect performance, unless new seeds are a dramatically different size. In that case, a new margin value might need to be found and set.

Attention: **The sensitivity control has several optional features not being used by this application. The above procedure is all you will need to do to operate the machine, but if you accidentally alter the default settings of the sensitivity control, the machine may not function as intended. If you suspect that you may have accidentally altered the factory setup of the sensitivity control, refer to page 59 to return the device to its original factory condition. After that you will still need to do the sensitivity adjustment described above.**
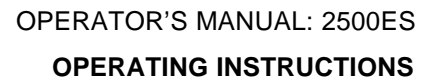
2.3.7 Count and suction values.

The seed counter is designed to count at least the target number of seeds each cycle. How quickly it can stop after the target is reached is affected by programmable adjustments.

Several programmable values must be defined to control accuracy and speed. To a certain extent, increased speed will cause the count to go further past the target count. The following parameters must be set for each type of seed that you count.

Count shift point: Suction values should decrease as the target count is approached. Suction starts at system maximum, then drops to a high stage, then medium stage, and then low stage for the final counting. The program allows you to define the count number at which the shift in suction changes. Typical count shift points could be 100 seeds-to-go for high, 50 seeds-to-go for medium, and 10 seeds-to-go for low.

Suction values: The actual suction values are programmable for each of the count ranges. Value choices are between 4000 and 1. Typical values could be 1000 for high, 300 for medium, and 200 for low.

The above values will need to vary according to seed size, and speed and accuracy goals. Smaller seeds may require lower suction values along with higher count shift points. Keep a record of your settings in a table like the one shown below.

Table of recommended count and suction values							
Type of seed	Nozzle Size	Count Shift Points			Suction Values		
		High	Medium	Low	High	Medium	Low

2.4 Operating procedure.

Attention: Operate the machine only as described in these operating instructions. Use the machine only as designed and intended. Refer to page 9.

Attention: Before starting operation each day, test to be sure the machine and its safety features are working properly (see paragraph 1). Refer to page 8 for instructions about performing a daily functional test.

2.4.1 General setup

The Model 2500 Seed Counter can operate in four different ways:

1. With envelope carousel (2500E), filling a predetermined number of envelopes by counting seeds (see paragraph 4.2).

2. With the envelope carousel (2500E), filling a predetermined number of envelopes by counting seeds (see paragraph 4.2), and with the scale option added.   The counted seeds must be moved over to the scale after the counting cycle has finished.

3. Without the carousel (2500S), filling as many containers as you want, one at a time, by counting seeds (see paragraph 4.3).

4. Without the carousel (2500S), and using the scale option, filling as many containers as you want, one at a time with the ability to calculate seeds per pound and production bag weight (see paragraph 4.4). The container sits directly on the scale and the calculations are made in real-time. Calculations are ready as soon as the last seeds drop and the scale's stable indicator is lit.

2.4.2 Configure for seed size

Regardless of the way that you will be running, the machine must be configured for the specific seeds that you will be counting.

1. Inspect for any damaged or missing parts. Immediately report any problem to your supervisor.

2. Connect electrical and pneumatic supplies to the machine.

3. Select and install the count nozzle (see paragraph 2.3.1).

4. Select and install the cleanout nozzle (see paragraph 2.3.4).

5. Turn the power switch (S1) on.

6. Adjust sensitivity for your specific seed size (see paragraph 2.3.5).

7. Load seeds into the inlet hopper. Never pour seeds directly into the seed tray. Never touch the photo sensor mounted above the seed tray because its adjustment is critical for sensing whether seeds are present on the tray.

8. Press the Home Indexer button to home the carousel (see paragraph 2.5.1).

9. Press the Mode Select and Startup button on the Startup view (see paragraph 2.5.2).

10. From the Machine Option Selection view select envelope mode if you want to use the carousel; or batch mode if you do not want to use the carousel (see paragraph 2.5.3).

11. Then press the Advanced Run Button to go to the count screen.

12. Touch the motor button to run the motor.

13. Touch the hopper button to allow seeds to flow onto the rotating seed tray. Touch the hopper button again to stop the flow of seeds onto the seed tray. Use care to not add too many seeds. Seeds should only cover approximately 50% of the bottom of the seed tray.

14. Adjust the upstream partition (fishtail) to create a split in the stream of seeds, with the stream near the rim of the tray being approximately 20 mm (3/4 inch) (see paragraph 2.3.2).

15. Adjust the position of the count nozzle (see paragraph 2.3.3).

16. Adjust the position of the cleanout nozzle (see paragraph 2.3.4).

17. Press the motor button to stop the motor.

2.4.3   Procedure to run Envelope Operation (using carousel)

1. Turn on the main power switch.

2. Touch Home Indexer to home the carousel.

3. Touch Mode Select and Setup button (Machine Option Selection view will appear).

4. Touch Envelope to select envelope mode (see page 22).

5. Touch Advanced Run to go to the Advanced Run Envelope mode view (see page 22).

6. Touch R2 for Speed (Speed and Threshold Settings view will appear, page 40). Define your settings as needed, or press one of the preset buttons (A through E) load a set of values that have been stored in memory if they are what you want to use.

7. Touch R5 to go to the Calibrate view (page 42) to determine suction for "slow speed" as described on page 43.

8. Touch R6 once to return to Speed Setting view.

9. Enter the calculated slow speed value, then hold down the previously selected preset button (A through E) to store the updated values, the "Speed and Threshold Settings" label will flash (page 40).

10. Touch the R6 button once more to return to Advanced Run Envelope Mode view.

11. Touch R5 to go to Mode of Operation view (see page 48)

12. Define Start Air Puff status (enabled versus disabled).

13. Define Done Air Puff status (enabled versus disabled).

14. Define Auto Cleanout status (enabled versus disabled), or Remnant status (count remnant versus don't count remnant).

15. Touch R6 to return to Advanced Run Envelope Mode view.

16. Touch Envelope Quantity or Seeds Per Envelope to open the Pocket Setup view to define envelope settings (see page 30).

17. Load the carousel with envelopes.

18. Load seeds into the hopper.

19. Touch the Cycle Start to run.

20. If you touch the Cycle Stop button, you will have to home the machine, reload envelopes, and start again from the beginning of the defined cycle. If you do not want to cancel the cycle, press the Pause button instead. See page 28 for more info.

2.4.4   Procedure to run in Batch mode (without the carousel)

1. Turn on the main power switch.

2. If the indexer is connected and enabled, touch Home Indexer to home the Carousel (otherwise skip to step 5).

3. Touch Mode Select and Setup button (Machine Option Selection view will appear)

4. Touch Batch to select batch mode (see page 22)

5. Touch Advanced Run to go to the Advanced Run Batch Mode view (see page 36).

6. Press R2 for Speed (Speed and Threshold Settings view will appear, page 40). Define your settings as needed, or press one of the preset buttons (A through E) load a set of values that have been stored in memory if they are what you want to use.

7. Calibrate suction for "slow speed" as described on page 43.

8. Press R6 to return to the Speed and Threshold Settings view. Update the speed and threshold values as necessary.

9. Press the R6 button once more to return to the Advanced Run Batch Mode view.

10. Press R5 for Mode of Operation Setup (see page 48).

11. Define Start Air Puff status (enabled versus disabled).

12. Define Done Air Puff status (enabled versus disabled).

13. Define Auto Cleanout status (enabled versus disabled), or Remnant status (count remnant versus don't count remnant).

14. Press R6 to return Advanced Run Batch Mode view.

15. Define Seeds Per Batch quantity for how many seeds will be counted into each container.

16. Define the Batch Quantity for how many containers you want to fill.

17. Load seeds into the hopper.

18. Turn the motor on.

19. Using the touch screen control, load seeds onto the seed tray.

20. Touch and hold Batch Cycle Start button to run. After two seconds, the cycle will start, and you may release the button.

21. If you touch the Cycle Stop button, you must empty the envelope. The next cycle will beginning counting from zero again. If you wish to stop counting but not cancel the batch use the Pause Button instead. (see page 36)

2.5 Touch Screen views – 2500 Series Seed Counter

The machine is controlled by using the touch screen module. The touch screen is sensitive to user pressure. Use your fingertips to gently touch the area defined on the touch screen in order to communicate your commands.

Caution: The touch screen may be damaged if rigid objects contact the touch screen, or if heavy pressure is exerted on the touch screen. Protect the touch screen from moisture.

Navigation buttons are located along the right side of each view, to quickly jump from one view to another. On some machines, these are physical membrane switches, with labels on the touch screen to identify the function of the adjacent membrane switch. On other machines, the touch screen itself provides the buttons with the same function and labels.

The text that follows describes a machine with the membrane switch design.

### 2.5.1 Home Indexer view (2500E only)
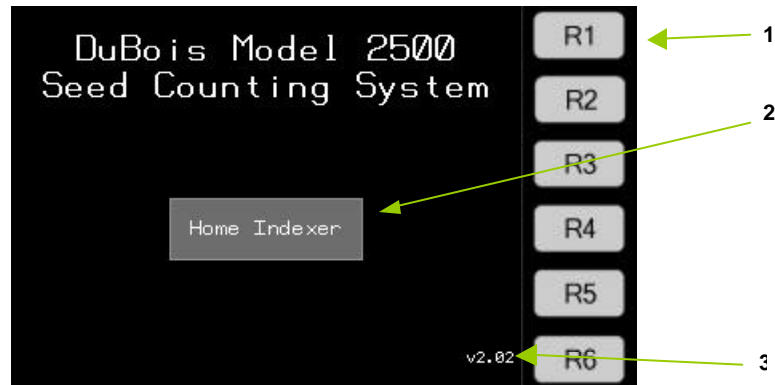
V01

The Home Indexer view is the first view to appear after the machine is turned on. Homing the machine centers the first envelope under the count funnel.

1. Membrane switches: On the Home Indexer view, the membrane switches have no function. (Note: On some machines, these are physical membrane switches, with labels on the touch screen to identify the function of the adjacent membrane switch. On other machines, the touch screen itself provides the buttons with the same function and labels.)
2. Home Indexer: Touch to home the indexer. The indexer will rotate in the clockwise direction until the home switch is made. Once the homing routine is completed, two options will appear. This is the startup view.
3. Version Number: Displays software version number. May differ from what's shown.

2.5.2 Startup view
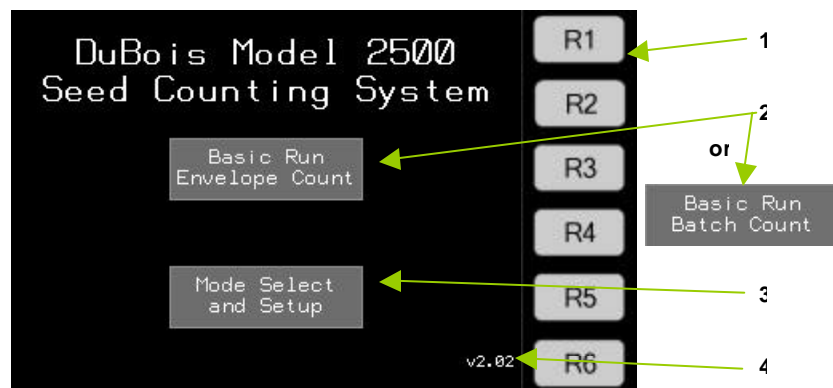
Once indexer has been homed, the Startup screen appears.

1. Membrane switches: On the Startup view, the membrane switches have no function. (Note: On some machines, these are physical membrane switches, with labels on the touch screen to identify the function of the adjacent membrane switch. On other machines, the touch screen itself provides the buttons with the same function and labels.)
2. Basic Run Envelope Count or Basic Run Batch Count: The mode selected, Batch or Envelope, is shown on the button. Touch to go to the Basic Run screen associated with the current mode where counting can be started using previously defined parameters. To adjust the parameters touch the Mode Select and Startup button.
3. Mode Select and Setup button: Touch to go to the Machine Option Selection screen. This is where you access all machine functions and setup
4. Version Number: Displays software version number. May differ than what's shown.
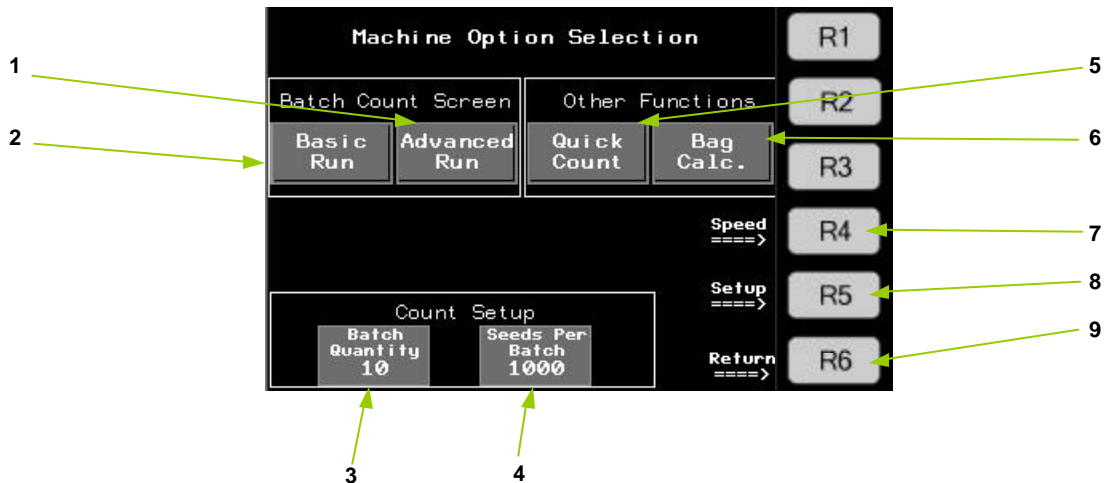
2.5.3 Machine Option Selection view (Indexer and scale connected)
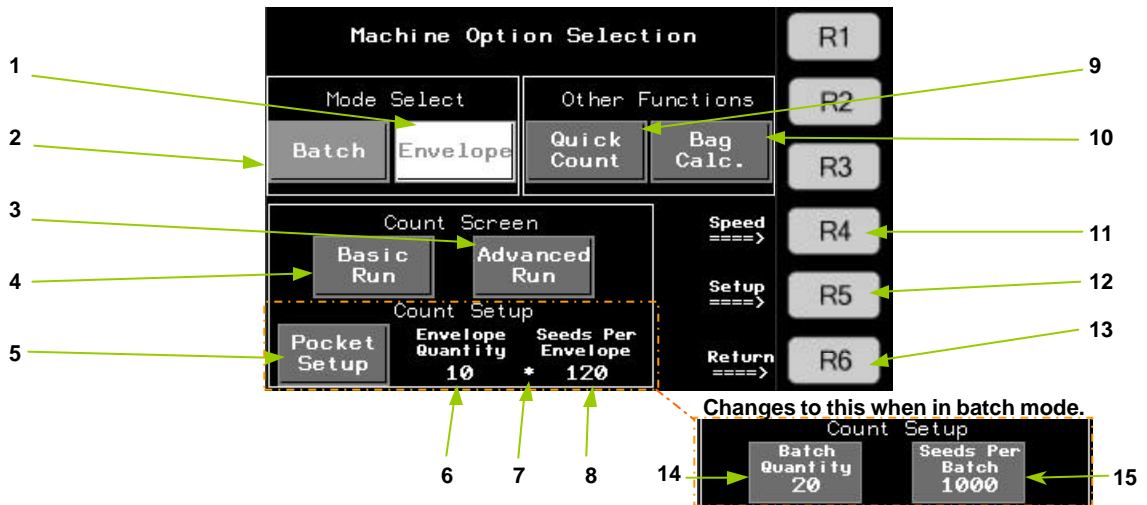
This screen will vary with the installed options. For example, if the Scale is not installed the Bag Calculator button will not be available. If the indexer is not connected the view will be as on page 23.

1. Envelope mode button: Touch to set up the machine in envelope mode. When button is pressed it is highlighted and basic and advanced run screens are now set to envelope mode. Used to count seeds using the carousel.

2. Batch mode button: Touch to set up the machine in batch mode. When button is pressed it is highlighted and basic and advanced run screens are now set to batch mode. Seeds are counted into whichever station is under the count funnel. The indexer does not move automatically in batch mode. Used to count multiples of the same count without the indexer. Count setup is displayed differently as shown in offset picture above.

3. Advanced Run button: Touch to go to the advanced Run Screen for the selected mode. (Envelope mode page 28, Batch Mode page 36).

4. Basic Run button: Touch to go to the basic run screen for the selected mode (Envelope Mode page 24, Batch Mode page 32).

5. Pocket Setup (envelope mode) button: Touch to go to the pocket setup screen. Used to adjust the quantity of envelopes and number of seeds in each envelope (page 30).

6. Envelope Quantity (envelope mode) field: Number of envelopes to fill. Touch pocket setup to adjust.

7. Batch Quantity Different (envelope mode) indicator: When show each envelope can have a different count. Touch pocket setup (5) to adjust.

8. Seeds Per Envelope (envelope mode) field: Seeds per envelope display. When batch quantity different indicator is lit this number shows the count in the first pocket only. Touch pocket setup (5) to adjust.

9. Quick Count button: Touch to go to the quick count view (page 39). This mode lets you count a single batch of seeds independently of the current mode and count setup.

10. Bag Calculator button: Touch to go to the bag calculator screen (shown if scale equipped) (page 50

11. Speed Setup membrane switch: Touch to go to the speed setup screen (page 40).

12. Setup Menu membrane switch: Touch to go to the setup menu to adjust start and end of cycle options. (page 48).

13. (R6) Return membrane switch: Return to previous view.

14. Batch Quantity (batch mode) button and display: Touch to edit the number of batches to run.

15. Seeds Per Batch (batch mode) button and display: Touch to edit the number of seeds per batch to run.

2.5.4 Machine Option Selection view (No Indexer, scale connected)

This screen will vary with the installed options. For example, if the Scale is not installed the Bag Calculator button will not be available. If the indexer is connected and enabled, the view will be as show in section 2.5.3.

1. <u>Advanced Run</u> button: Touch to go to the advanced Run Screen (page 36).
2. <u>Basic Run</u> button: Touch to go to the basic run screen (page 32).
3. <u>Batch Quantity</u> button and display: Touch to edit the number of batches to run.
4. <u>Seeds Per Batch</u> button and display: Touch to edit the number of seeds per batch to run.
5. <u>Quick Count</u> button: Touch to go to the quick count view (page 39). This mode lets you count a single batch of seeds independently of the current setup.
6. <u>Bag Calculator</u> button: Touch to go to the bag calculator screen (if scale equipped) (page 50).
7. <u>Speed Setup</u> membrane switch: Touch to go to the speed setup screen (page 40).
8. <u>Setup Menu</u> membrane switch: Touch to go to the setup menu to adjust start and end of cycle options. (page 48).
9. <u>(R6)</u> Return membrane switch: Return to previous view.

### 2.5.5 Basic Run Envelope view (while cycle is not started)
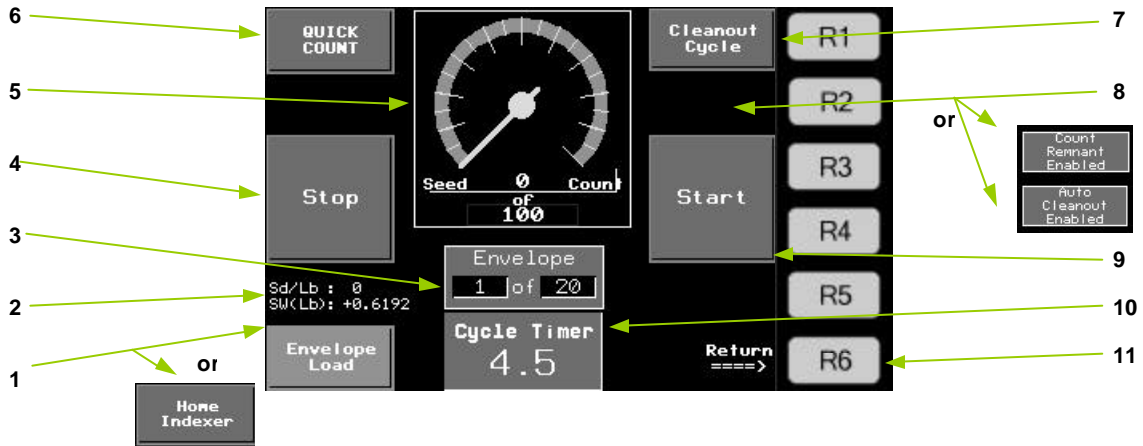
Once the desired settings have been entered, this view provides simple control of the cycle. Envelope count and seeds per envelope cannot be entered here. These can be edited from the Advanced Run Batch Mode view or from the Machine Option Selection view.

1. Envelope Load or Home Indexer button: There are two states for this button.

    1. Envelope load: When the indexer is at the home position this button is shown. When pressed the carousel indexes to allow envelopes to be loaded.

    2. Home Indexer: Press this button to send the indexer to the home position. While in the Envelope Load cycle pressing the Home indexer button will cancel the Envelope load and return the indexer to the home position. When the indexer is not at the home position this button is shown and flashes indicating the indexer is not in the home position. The cycle will not start unless the indexer is homed.

2. Scale field: When the scale function is enabled this display is shown. The top line shows seeds per X where X is the weight unit set in the Scale Setup screen. The bottom line shows the scale weight and the label in parentheses is the weight unit set in the Scale Setup screen. *Default scale units are pounds. The seeds per display is calculated from the seed count value and the weight on the scale (see page 55).

3. Envelope field: Shows the current envelope being filled on the left and the total number of envelopes to count on the right. Press this field to open the Pocket Setup screen. (If this feature is enabled in setup, page 53)

4. Stop button: Touch the Stop button to stop running the machine before it reaches the end of its normal cycle. Restarting will start a new cycle from the beginning. If you do not want to cancel the cycle, press the Pause button instead. See page 26 for more info.

5. Seed Count field: The intended total seeds being counted for the current envelope is displayed, and the dial moves to indicate where you are in the counting sequence. Press the seed count to open the Pocket Setup screen. (If this feature is enabled in setup, page 53)

6. Quick Count button: Touch to go to the Quick Count Screen where you can count seeds independent of the current setup.

7. <u>Cleanout Cycle</u> button: Touch to start the cleanout cycle, in which all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

8. <u>End of Cycle Mode</u> indicator: This area shows the current end of cycle mode that is selected. There are three options for this.

    1. No display: No end of cycle mode is selected. Any seeds on tray or in hopper are left there.

    2. Auto Cleanout Enabled: When displayed, at the end of the envelope counting cycle, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

    3. Auto Remnant Enabled: When displayed, at the end of the envelope counting cycle, the machine will count and deliver all remaining seeds to the remnant station of the carousel. The count will be displayed in the Seed Count field.

9. <u>Start</u> button: Touch the Start button to run the machine according to current settings, starting at the beginning of a new count cycle.

10. <u>Cycle Timer</u> field: The field shows the time in seconds that was last required to run one cycle.

11. <u>R6</u> membrane switch: Press the R6 button to return to the previous screen.

### 2.5.6 Basic Run Envelope view (while cycle is running)
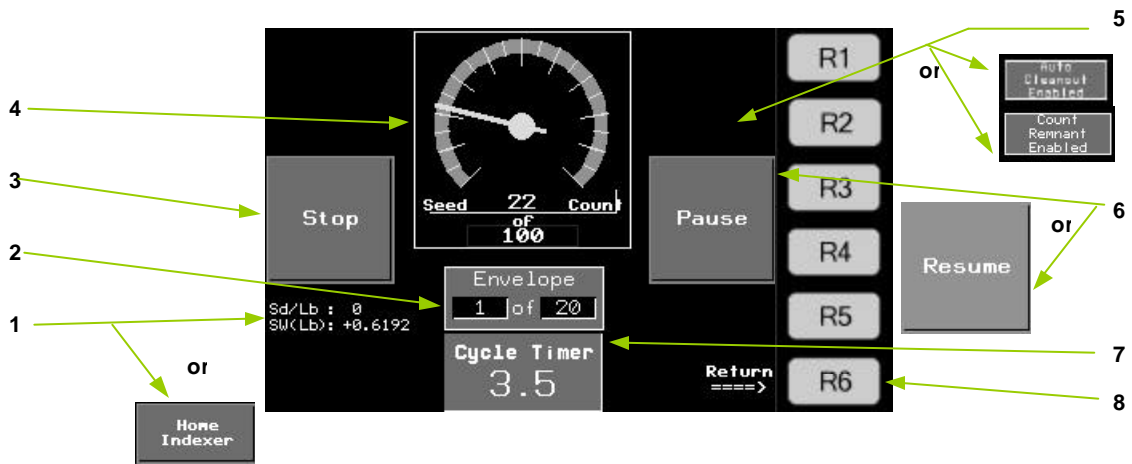
Once the cycle has started the screen changes to reflect the available options. These are explained below.

1. Envelope field: Shows the current envelope being filled on the left and the total number of envelopes on the right.

2. Scale field: When the scale function is enabled this display is shown. The top line shows seeds per x where x is the weight unit set in the Scale Setup screen. The bottom line shows the scale weight and the label in parentheses is the weight unit set in the Scale Setup screen. *Default scale units are pounds. The seeds per display is calculated from the seed count value and the weight on the scale (see page 55 for units setup).

3. Stop button: Touch the Stop button to stop running the machine before it reaches the end of its normal cycle. Restarting will start a new cycle from the beginning. If you do not wish to cancel the current cycle, use the "Pause" function instead (see #6 below).

4. Seed Count field: The intended total seeds being counted for each envelope is displayed, and the dial moves to indicate where you are in the counting sequence.

5. End of Cycle Mode indicator: This area shows the current end of cycle mode that is selected. There are three options for this.

    1. No display: No end of cycle mode is selected. Any seeds on tray or in hopper are left there.

    2. Auto Cleanout Enabled: When displayed, at the end of the envelope counting cycle, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

    3. Auto Remnant Enabled: When displayed, at the end of the envelope counting cycle, the machine will count and deliver all remaining seeds to the remnant station of the carousel. The count will be displayed in the Seed Count field.

6. Pause or Resume button: Touch the Pause button to pause the current cycle; the Resume button is then displayed in its place. Touch the Resume button to resume a paused cycle.

7. Cycle Timer field: The field shows the time in seconds for the current cycle including while paused.

8. R6 button: Press the R6 button to return to the previous screen.

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2.5.7 Advanced Run Envelope Mode view
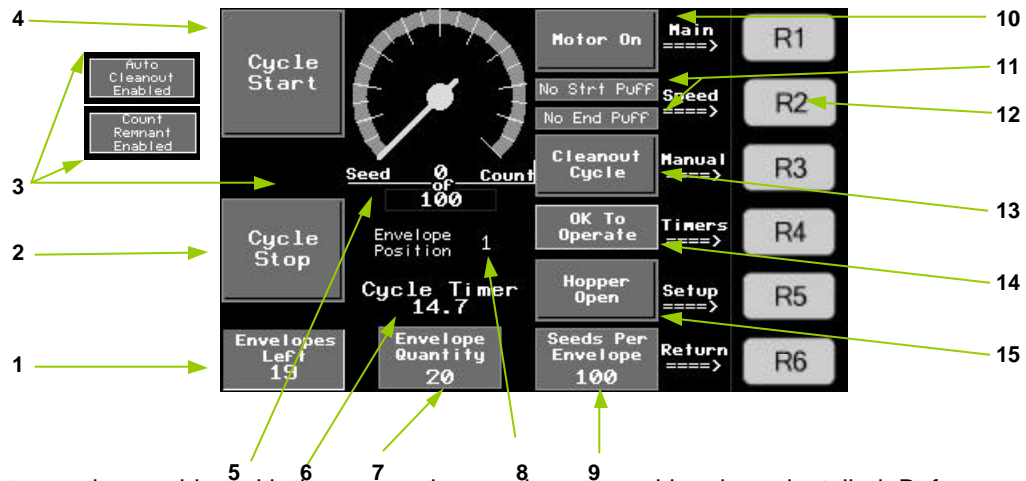
V13

Use this view to run the machine with the carousel, once the carousel has been installed. Before running, the following must be defined: seeds/envelope; envelope quantity.

1. <u>Envelopes Left</u> display: The field shows how many envelopes are left to be filled in the current cycle.

2. <u>Cycle Stop</u> button: Touch the Stop button to stop running the machine before it reaches the end of its normal cycle. Restarting will start a new cycle from the beginning. If you wish to pause the cycle use the "Pause" function (see #4 below). The indexer will remain where it is. *Note: The machine will only start a new cycle from the home position. Use the Manual Operation screen (R3) to manually home the indexer.

3. <u>End of Cycle Mode</u> indicator: This area shows the current end of cycle mode that is selected. There are three options for this.

    1. No display: No end of cycle mode is selected. Any seeds on tray or in the hopper are left there.

    2. Auto Cleanout Enabled: When displayed, at the end of the envelope counting cycle, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

    3. Auto Remnant Enabled: When displayed, at the end of the envelope counting cycle, the machine will count and deliver all remaining seeds to the remnant station of the carousel. The count will be displayed in the Seed Count field.

4. <u>Cycle Start</u> button: Touch to start your batch using the current batch cycle settings. Your batch must first be defined, as noted above.

    After cycle has been started, the button has the following three states:

    1. Pause Button: Touch to pause the current batch. The foot switch (if connected) can also be used to pause counting.

    2. Resume Button (flashes): Touch to resume a pause counting. The foot switch (if connected) can also be used to resume counting.

3. [In Cycle] In Cycle Indicator: Displays while between indexes. This is not a button.

5. <u>Seed Count</u> field: The actual count over intended total seeds being counted for each envelope is displayed. The dial moves to indicate (as a percentage of the total) the amount of seed counted.

6. <u>Cycle Timer</u> field: The field shows the time in seconds for the current cycle including while paused.

7. <u>Envelope Quantity</u> button and display: Touch to go to the Pocket Setup screen to set the number of envelopes and seed counts.   Display shows the total number of envelopes to fill per cycle.

8. <u>Envelope Position</u> field: The field shows which envelope is currently aligned with the count funnel.

9. <u>Seeds Per Envelope</u> button and display: Pressing this button will open the Pocket Setup screen. This field will show how many seeds will be counted into each envelope using the current settings. *Note: if counting different seeds in each envelope the count for the first envelope is shown here.

10. <u>Motor On</u> button: Touch to manually run the motor. Touch again to stop the motor. The motor turns the seed tray. *Note: The seed tray will automatically start or stop with the cycle. However, if the motor is manually run with this button it will not automatically stop at the end of the cycle.

11. <u>Start Air Puff</u> and <u>End Air Puff</u> display: This display will show whether the start air puff and end air puff is enabled. See Mode of Operation Setup screen for more information (page 48).

12. Membrane Switches:

   - Press R1 to return to the Startup view.
   - Press R2 to go to the Speed and Threshold Settings view.
   - Press R3 to go to the Manual Operation view.
   - Press R4 to go to the Timer Settings view.
   - Press R5 to go to the Mode of Operation Setup view.
   - Press R6 to go to return to the previous view.

13. <u>Cleanout Cycle</u> button: Touch to start the cleanout cycle, in which all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

14. <u>OK to Operate</u> field: If this says anything other than "OK to Operate" the cycle will not start. Possible displays are as follows:

   a. [Man. Operate Only] Go to the Manual Operation view (R3) and clear manual selections. *Note: manually opening the hopper and/or manually running the table motor do not show this message and are ok to leave in either state if desired.

   b. [Not Home] Indexer must be at home to start. Press Home Indexer in the Manual Operation view (R3).

   c. [Home + Manual] Manual selection(s) are made and the indexer is not home. From Manual Operation view (R3) home the indexer and clear any manual selections (see page 44 Manual Operation view). *Note: manually opening the hopper and/or manually running the table motor will not affect this.

15. <u>Hopper Open</u> button: Touch the button to toggle the hopper open to allow seeds to flow onto the rotating seed tray. Touch the button again to toggle the hopper to close. Do not allow too many seeds to enter the seed tray. Once the machine is running, the hopper will automatically keep the tray filled with the proper amount of seeds.

2.5.8 Pocket Setup view

The pocket setup view is used to define the counts for envelope mode. You can count either the same amount in each envelope or a different count in each envelope. Pressing the Batch Quantity Same/Batch Quantity Different will toggle between the two. The screens for each are shown below.
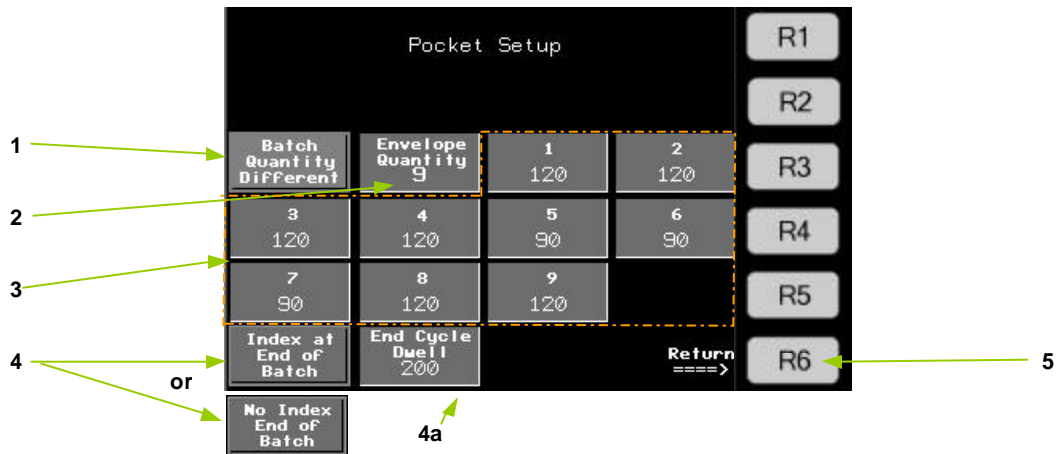
2.5.8.1   Batch Quantity Same
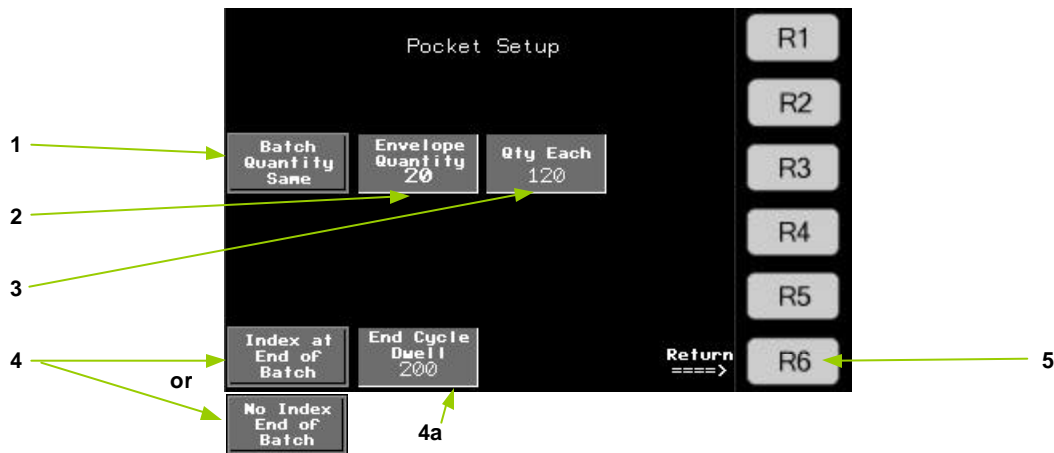
This is used when you wish to have the same quantity of seeds in each envelope. You may have greater than 10 envelopes in this mode. If a value greater than 10 is entered the indexer will fill 10 envelopes, then return to the home pocket to begin to fill the next batch of 10. This will continue until all envelopes are done counting.

1. Batch Quantity Same button and display: This display indicates that you wish to count the same quantity in each envelope. Touch to toggle display to Batch Quantity Different (see section 2.5.8.2).

2. Envelope Quantity button and display: Touch to access a numeric keypad to alter the value. This is the Qty of envelopes to be filled. More than 10 envelopes can be entered here.

3. Qty Each button and display: Touch to access a numeric keypad to alter the value. This is the quantity of seeds delivered to each envelope.

4. Index at End of Batch and No Index at End of Batch button: Defines whether the carousel moves one extra index to allow extra time to remove the last envelope before the indexer moves home (Index at End of Batch) or directly homes after last envelope.

    a. End Cycle Dwell button and display: This is shown when index at end of batch is shown. Touch to access a numeric keypad to alter the value. This value defines the amount of time the indexer pauses at the extra index. Typical value 200.

5. (R6) Membrane switch: Return to previous screen.

2.5.8.2   Batch Quantity Different

This is used when you wish to have a different quantity in each of the 10 envelope locations. You may have up to 10 envelopes per machine cycle in this mode.

1.   Batch Quantity Different button and display: This display indicates that you wish to count a different quantity in each envelope. Touch to toggle display to Batch Quantity Same (see section 2.5.8.1)

2.   Envelope Quantity button and display: Touch to access a numeric keypad to alter the value. This is the Qty of envelopes to be filled. Valid entries are between 1 and 10. If a number greater than 10 is entered the machine automatically adjusts the quantity back to 10.

3.   Qty Each buttons and display: The number of these buttons expands based on the number of envelopes entered in the "Envelope Quantity" field. Each bold number corresponds to the carousel index with the same number. A different count can be entered for each of these although they do not necessarily have to be different.

4.   Index at End of Batch and No Index at End of Batch button: Defines whether the carousel moves one extra index to allow extra time to remove the last envelope before the indexer moves home (Index at End of Batch) or directly homes after last envelope.

      a.   End Cycle Dwell button and display: This is shown when index at end of batch is shown. Touch to access a numeric keypad to alter the value. This value defines the amount of time the indexer pauses at the extra index. Typical value 200.

5.   (R6) Membrane switch: Return to previous screen.

2.5.9 Basic Run Batch Mode view (while cycle is not started)
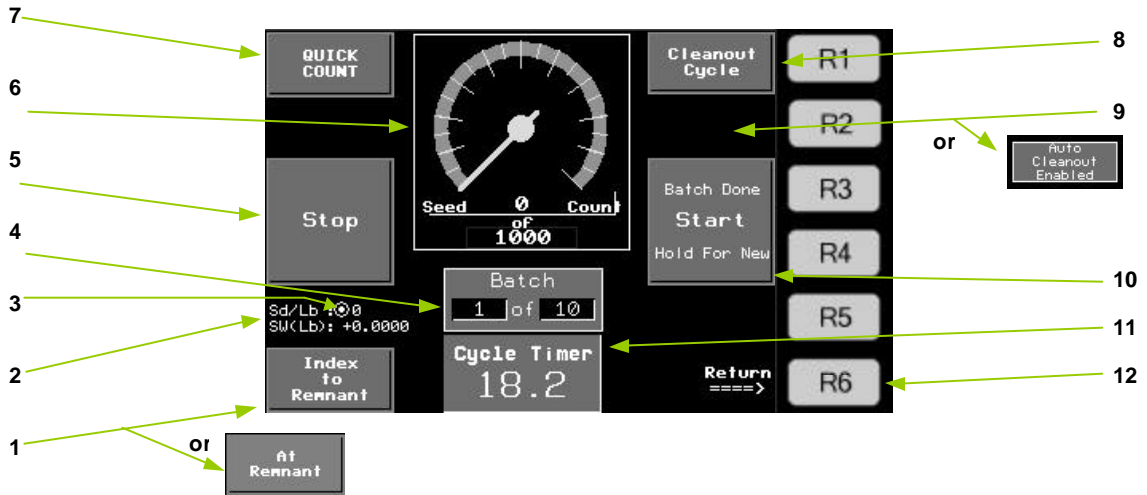

Once the desired settings have been entered, this view provides simple control of the cycle. Batch count and seeds per batch cannot be entered here. These can be edited from the Advanced Run Batch Mode view or from the Machine Option Selection view.

1. Index to Remnant button or At Remnant indicator: This area is blank if the indexer is not connected. When the indexer is connected there are two states for this button as follows:

    1. Index to Remnant: When the indexer is not at the remnant position this is shown. When pressed the carousel indexes to the remnant station.

    2. At Remnant: When the indexer is at the remnant position this indicator is lit. The remnant station is designed to count into much larger containers and thus can handle a much larger number of seeds.

2. Scale field: When the scale function is enabled, this display is shown. The top line shows seeds per x where x is the weight unit set in the Scale Setup screen. The bottom line shows the scale weight and the label in parentheses is the weight unit set in the Scale Setup screen. *Default scale units are pounds.   The seeds per display is calculated from the seed count value and the weight on the scale (page 55).

3. Stable indicator: Displays when scale has settled and is displaying a stable weight. Calculations are accurate when displayed.

4. Batch field: Shows the current batch being filled on the left and the total number of batches on the right. Press this field to adjust the batch count. (If this feature is enabled in setup, page 53)

5. Stop button: Touch the Stop button to stop running the machine before it reaches the end of its normal cycle. Restarting will start a new cycle from the beginning. If you wish to pause the cycle use the "Pause" function. Also can be used to interrupt a cleanout cycle.

6. Seed Count field: The count of the previous cycle is shown over the intended total seeds being counted for the current batch setup is displayed. The dial shows, as a percentage of full, where the machine is in the counting cycle.   Press the seed count to adjust the value. (If this feature is enabled in setup, page 53)

7. Quick Count button: Touch to go to the Quick Count Screen where you can count seeds independent of the current setup.

8. <u>Cleanout Cycle</u> button: Touch to start the cleanout cycle, in which all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

9. <u>End of Cycle Mode</u> indicator: This area shows the current end of cycle mode that is selected. There are three options for this.

    1. No display: No end of cycle mode is selected. Any seeds on tray or in hopper are left there.

    2. Auto Cleanout Enabled: When displayed, at the end of the envelope counting cycle, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

10. <u>Start</u> button: Touch the Start button to run the machine according to current settings, starting at the beginning of a new count cycle.

11. <u>Cycle Timer</u> field: The field shows the time in seconds that was last required to run one cycle.

12. <u>R6</u> membrane switch: Press the R6 button to return to the previous screen

## 2.5.10 Basic Run Batch Mode view (while cycle is running)
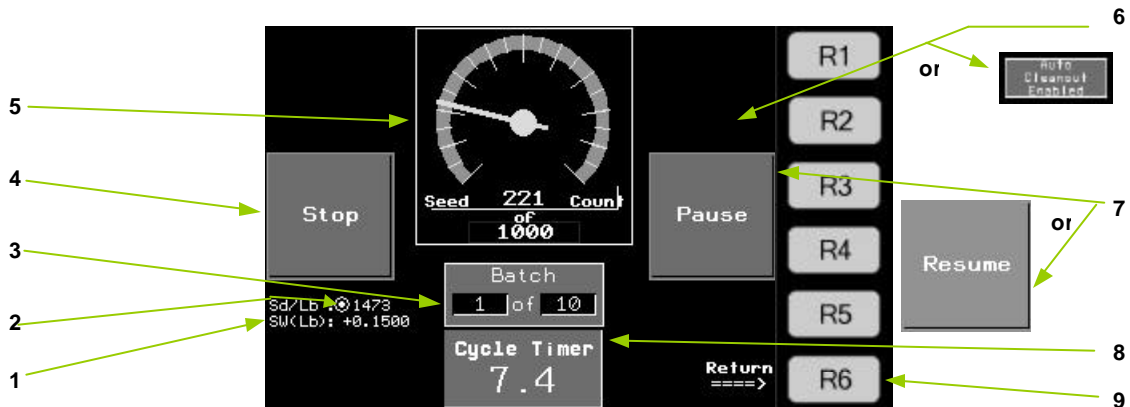
Once the cycle has started the screen changes to reflect the available options. These are explained below.

1. Scale field: When the scale function is enabled this display is shown. The top line shows seeds per X where X is the weight unit set in the Scale Setup screen. The bottom line shows the scale weight and the label in parentheses is the weight unit set in the Scale Setup screen. *Default scale units are pounds.   The seeds per display is calculated from the seed count value and the weight on the scale (page 55).

2. Stable indicator: Displays when scale has settled and is displaying a stable weight. Calculations are accurate when displayed.

3. Batch field: Shows the current batch being filled on the left and the total number of batches on the right.

4. Stop button: Touch the Stop button to stop running the machine before it reaches the end of its normal cycle. Restarting will start a new cycle from the beginning. If you wish to pause the cycle use the "Pause" function (See #7). Also can be used to interrupt a cleanout cycle.

5. Seed Count field: The real time count is shown over the intended total seeds being counted for the current batch setup is displayed. The dial shows, as a percentage of full, where the machine is in the counting cycle.

6. End of Cycle Mode indicator: This area shows the current end of cycle mode that is selected (see page 48). There are three options for this.

    a. No display: No end of cycle mode is selected. Any seeds on tray or in hopper are left there.

    b. Auto Cleanout Enabled: When displayed, at the end of the last batch, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

7. Pause or Resume button: Touch the Pause button to pause the current cycle; the Resume button is then displayed in its place. Press to resume the cycle.

8. Cycle Timer field: The field shows the time in seconds for the current cycle including while paused.

9. R6 button: Press the R6 button to return to the previous screen.

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2.5.11 Advanced Run Batch Mode view
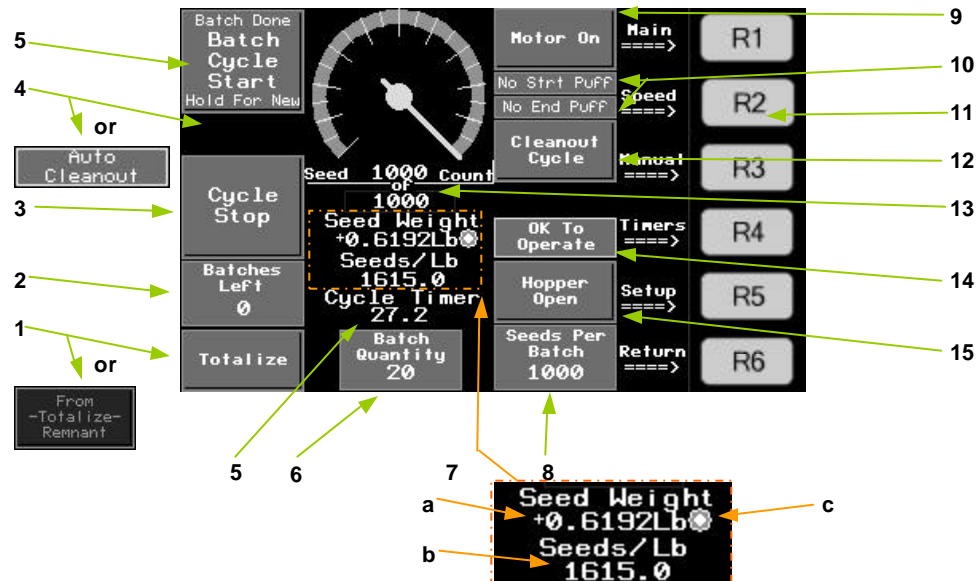
When Advanced Run in batch mode is selected, the above view appears. Batch Mode is used to fill one container (for example, a bag or envelope) at a time, with the operator manually loading and unloading containers under the count funnel outlet, and manually cycling the machine to run and fill each container.

1. Totalize button or From Remnant Totalize indicator: When totalize button is visible touch to count how many seeds remain in the hopper and on the seed tray. If From Remnant Totalize is shown move indexer to the remnant station using the "Index to Remnant" button in the manual operation screen (page 44).

2. Batches Left field: The field reports how many count cycles are left to be run in the batch, as defined with the Batch Quantity button (see #6 below).

3. Cycle Stop button: Touch to stop the count or cleanout cycle. If it is not intended to cancel the batch use the Pause function instead.

4. End of Cycle Mode indicator: This area shows the current end of cycle mode that is selected (see page 48). There are two options for this.

    1. No display: No end of cycle mode is selected. Any seeds on the tray or in the hopper are left there.

    2. Auto Cleanout Enabled: When displayed, at the end of the last batch, all remaining seeds are sucked out of the rotating seed tray and delivered to the cleanout funnel, including any seeds in the hopper.

5. Batch Cycle Start button: Touch and hold (2 seconds) to run one count cycle with the current settings. When batch quantity is greater than 1, all subsequent batches are started without the 2 second delay.

    After cycle has been started, the button has the following two states:

    1. [Pause] Pause Button: Touch to pause the current batch. The foot switch (if connected) can also be used to pause counting.

2. [Resume] Resume Button (flashes): Touch to resume a pause counting. The foot switch (if connected) can also be used to resume counting.

6. Batch Quantity button and field: The field shows number of containers that the operator wishes to fill. Touch the button to access a numeric keypad to define the target number.

7. Scale Display: If scale is present and enabled this display will be visible and shows live seed weight and seeds per/X (where "X" is the units selected in the Scale Display Setup view (page 55). Default units are pounds (Lb).

   a. Seed weight in the units selected in Scale Display Setup view

   b. Seeds per/unit selected in Scale Display Setup view (page 55)

   c. Stable indicator. Displays when scale has settled and is displaying a stable weight. Calculations are accurate when displayed.

****Note**: Live seeds/X calculations are approximate and thus not accurate until the Stable indicator (See 7c) is displayed.

8. Seeds Per Batch button and field: The field shows how many seeds will be counted into each container (i.e. each time the Start Cycle is pressed). Touch to access a numeric keypad to define the target number.

9. Motor On button: Touch to manually run the motor. Touch again to stop the motor. The motor turns the seed tray. *Note: The seed tray will automatically start or stop with the cycle. However, if the motor is manually run with this button it will not automatically stop at the end of the cycle.

10. Start Air Puff and End Air Puff display: This display will show whether the "start air puff" and "end air puff" is enabled. See Mode of Operation Setup screen for more information (page 48).

11. Membrane Switches:

    - Press R1 to return to the Startup view.
    - Press R2 to go to the Speed and Threshold Settings view.
    - Press R3 to go to the Manual Operation view.
    - Press R4 to go to the Timer Settings view.
    - Press R5 to go to the Mode of Operation Setup view.
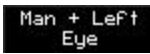   - Press R6 to go to return to the previous view.

12. Cleanout Cycle button: If desired, touch to start a cleanout cycle, which will move all seeds in the hopper and seed tray to the cleanout funnel. If the sensor for the cleanout funnel is enabled, the machine will not run the cleanout cycle unless a container is in position to catch the output of the cleanout funnel.

13. Seed Count field: The actual count over intended total seeds being counted for each envelope is displayed. The dial moves to indicate (as a percentage of the total) the amount of seed counted.

14. OK to Operate field: If this says anything other than "OK to Operate" the cycle will not start. Possible displays are as follows:

    a. [Man. Operate Only] Go to the Manual Operation view (R3) and clear manual selections. *Note: manually opening the hopper and/or manually running the table motor do not show this message and are ok to leave in either state if desired.

    b. [Check Beam] The left photo eye is not made, make sure container blocks the photo eye beam on the count funnel.

c. `Man + Left Eye` Manual selection(s) are made and the left photo-eye is not made. Make sure container blocks the photo eye beam on the count funnel. Then from Manual Operation view (R3) clear any manual selections. (page 44). *Note: manually opening the hopper and/or manually running the table motor will not affect this.

15. Hopper Open button: Touch the button to toggle the hopper open to allow seeds to flow from the hopper onto the rotating seed tray. Touch the button again to toggle the hopper to close. Once the machine is running a normal seed counting cycle, the hopper will automatically keep the tray filled with the proper amount of seeds.

Caution: Add only enough seeds that will allow the apparatus to create a divided stream of seeds on the seed tray. The hopper will remain open until you touch the button again to close it.

2.5.12 Quick Count view
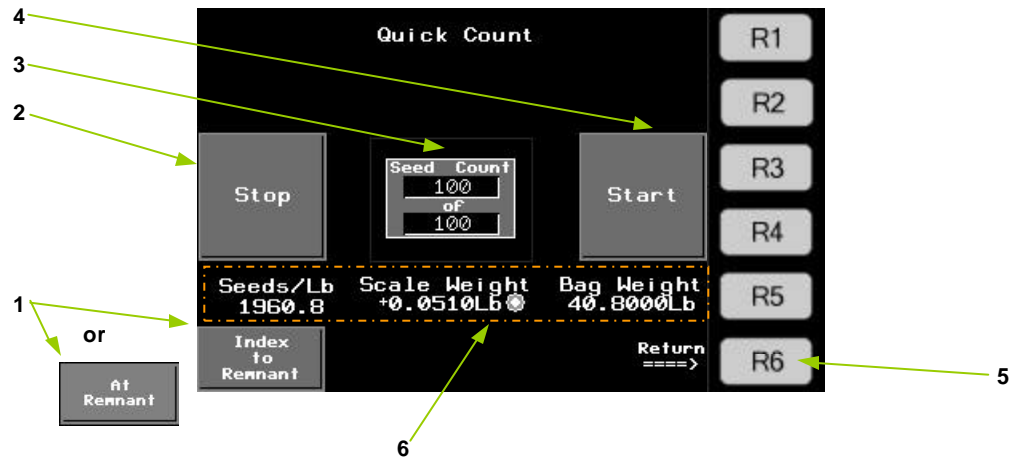
The quick count view is used to count a single batch of seeds independently of the current setup. The current setup's count values will not be disturbed.

1. Index to Remnant button or At Remnant indicator: This area is blank if the indexer is not connected. When the indexer is connected there are two states for this button as follows:

    a. Index to Remnant: When the indexer is not at the remnant position this is shown. When pressed the carousel indexes to the remnant station.

    b. At Remnant: When the indexer is at the remnant position this indicator is lit. The remnant station is designed to count into much larger containers and thus can handle a much larger number of seeds.

2. Stop button: Touch the Stop button to interrupt the count cycle. Restarting will start a new cycle from the beginning. If you wish to pause the cycle use the "Pause" function.

3. Seed Count field and button: Touch to access a numeric keypad to enter the desired count. The field shows the current actual value of seeds counted over the desired count.

4. Start button: Touch to run one count cycle.

   After cycle has been started, the button has the following two states:

    1. Pause Button: Touch to pause the current batch. The foot switch (if connected) can also be used to pause counting.

    2. Resume Button (flashes): Touch to resume a pause counting. The foot switch (if connected) can also be used to resume counting.

5. R6/Return button: Stops current cycle (if running) and returns to the previous screen.

6. Scale Display: See page 55 for detailed description of scale display.

2.5.13 Speed and Threshold Settings view
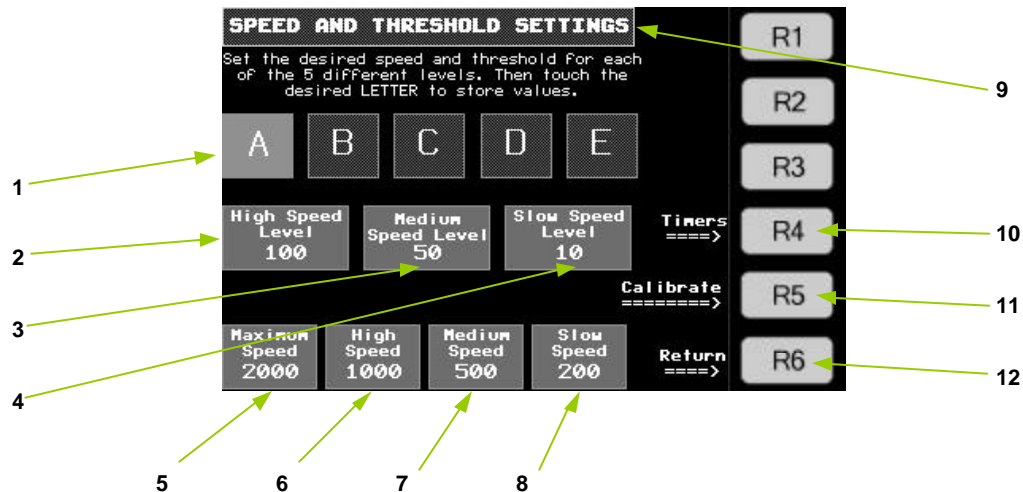
V02

Label text: "Set the desired speed and threshold values. If desired, touch and hold the desired LETTER to store values." The view label (9) will flash when the values have been successfully stored.

Set the speed and threshold values that you want to use to run for the specific seeds you will be counting.

Once a set of values are set in the current memory, you may return to the operation view and begin running.

If you want to save a set of values for future use, you must first load the values that are stored in the memory letter, and then alter the values to the new settings. Once the new values have been altered, press and hold the memory letter to save to that memory location. Note: You cannot set values, and then save them to a letter memory, because when you press the letter memory button, the first thing that happens is the existing stored values will be loaded.

1. Preset buttons: If desired, touch a preset button (A, B, C, D or E) to load its set of values into the current memory to run the machine. Up to five sets of values may be saved into the five preset memories. Once values are loading into the current memory (illustration shows "A" selected), the values may be altered by touching the respective setup buttons and altering the values. To save any changes, press and hold the respective letter button until the view label flashes. Keep a written record of what type of seeds are defined in the A-E memories.

2. High Speed Level (seeds left to count) button: Touch the button to access a numeric keypad to alter the value. "High Speed Level" refers to the number of seeds left to count when you want the suction value to drop slightly in order to gradually slow the system down, and allow it to be able to stop accurately at the target count.

3. Medium Speed Level (seeds left to count) button: Touch the button to access a numeric keypad to alter the value. "Medium Speed Level" refers to the number of seeds left to count when you want the suction value to drop slightly in order to gradually slow the system down, and allow it to be able to stop accurately at the target count.

4. Slow Speed Level (seeds left to count) button: Touch the button to access a numeric keypad to alter the value. "Slow Speed Level" refers to the number of seeds left to count when you want the suction value to drop slightly in order to gradually slow the system down, and allow it to be able to stop accurately at the target count.

5. Maximum Speed (suction value) button: Touch the button to access a numeric keypad to alter the value. Values are an index number, and have no unit value (they range from 0 to 4000). The "Maximum Speed" should be set to 2000 so that the full regulated air pressure is used to generate the full suction. The machine will use this value until the count reaches the value that has been set in the "High Speed Level" setting.

**Note: The Maximum speed is the speed that is used by the Totalize and Count Remnant functions.

6. High Speed (suction value) button: Touch the button to access a numeric keypad to alter the value. Values are an index number, and have no unit value (they range from 0 to 4000). Set "High Speed" to decrease the suction as the counter reaches its target count. The machine will use this value when the count reaches the value that has been set in the "High Speed Level" setting.

7. Medium Speed (suction value) button: Touch the button to access a numeric keypad to alter the value. Values are an index number, and have no unit value (they range from 0 to 4000). Set "Medium Speed" to decrease the suction as the counter reaches its target count. The machine will use this value when the count reaches the value that has been set in the "Medium Speed Level" setting.

8. Slow Speed (suction value) button: Touch the button to access a numeric keypad to alter the value. Values are an index number, and have no unit value (they range from 0 to 4000). Set "Slow Speed" to decrease the suction as the counter reaches its target count. The machine will use this value when the count reaches the value that has been set in the "Slow Speed Level" setting.

9. View label field: The text will flash when data is successfully stored to one of the letter memory locations.

10. (R4) membrane switch: Press R4 to go to the Timers view (see page 46).

11. (R5) membrane switch: Press R5 to go to the Calibrate view (see page 42), where you can test for the best suction values for the actual seeds you will be counting, and calibrate for the best slow speed value.

12. (R6) membrane switch: Press R6 to return previous screen.

2.5.14 Calibrate view
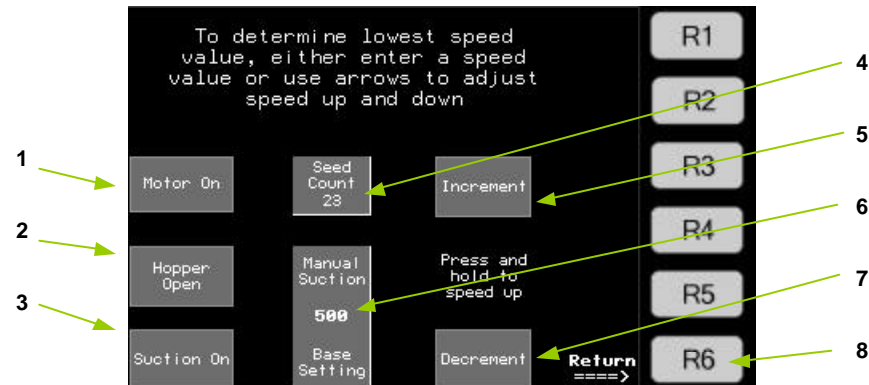
V15

Label text: "To determine lowest speed values, either enter a speed value, or use arrows to adjust speed up and down."

If you need help determining the appropriate threshold values for the Speed and Threshold settings (see page 40), you may use this view to test the results of various suction values on the specific seeds you will be counting. The values that you test here will not transfer to the Speed and Threshold Settings view. Once you have determined the desired numeric values for High, Medium, and Slow speeds, set them on the Speed and Threshold Settings view.

This view allows you to select a test value either by directly entering a numeric value, or by increasing or decreasing the current value to test a new value.

1. Motor On button: Touch the button to turn on the motor that rotates the seed tray.

2. Hopper Open button: Touch the button to open the hopper and allow seeds to flow onto the seed tray. Press the button again to close the hopper.

3. Suction On button: Touch to turn suction on in the count tube, according to the current setting of the suction value.

4. Seed Count field: The field shows the number of the seeds being seen, giving an indication of how fast the seeds are being picked up. When setting the slow speed, you want to see that the counting is slowed down to approximately 1 or 2 per second.

5. Increment button: Touch the button briefly to increase the current value by one (values range from 0 to 4000, where 4000 is maximum suction). Touch and hold the button to increment the value at a progressively faster rate.

6. Manual Suction Base Setting field and button: Touch the button to access a numeric keypad where you may enter suction values directly. Values are an index number, and have no unit value (they range from 0 to 4000, where 4000 is maximum suction). The field shows the current value that has been set.

7. Decrement button: Touch the button briefly to decrease the current value by one (values range from 0 to 4000, where 4000 is maximum suction). Touch and hold the button to decrease the value at a progressively faster rate.

8. R6 membrane switch: Press R6 to return to the previous view (Speed and Threshold Settings view).

Procedure for typical calibration test.

1. Turn motor on.

2. Open Hopper to add seeds, if needed, onto the seed tray.

3. Turn suction on. Value will start at the last previously tested value.

4. Using the Manual Suction/Base Setting button, adjust suction to a low value, and then raise the value to determine when suction starts to pick up seeds reliably (for example, one to two seeds per second, or slow enough you can count along with the flow of seeds).

5. Observe the value that is shown in the center of the Manual Suction/Base Setting button. This is the value that you want to enter on the Speed and Threshold Settings view for Slow Speed suction value.

6. Typically, Medium Speed = Slow Speed +100.

7. Typically, High Speed = Medium Speed + 500.

2.5.15 Manual Operation view
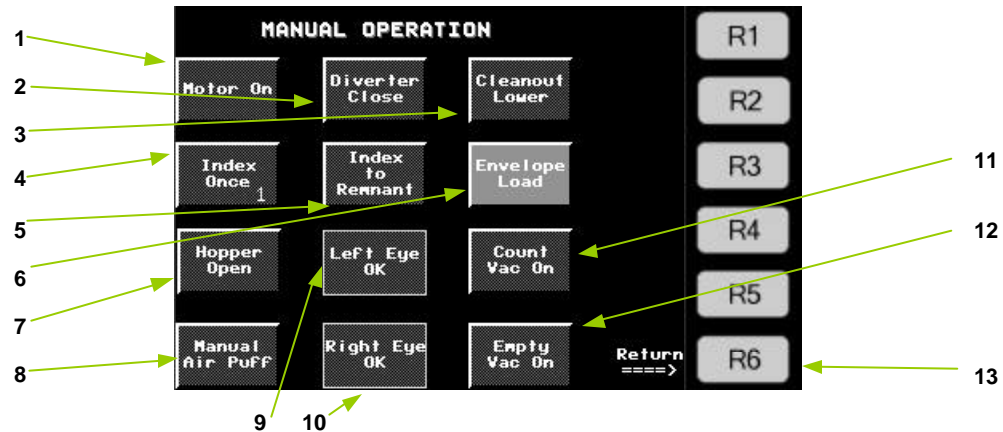
The Manual Operation view is available in order to actuate individual parts of the machine separate from automatic cycles. Use this for maintenance and setup procedures.

How to interpret the button labels: All labels on the buttons of the Manual Mode view describe what will happen if you touch the button (not what the current state of the component is).

1. <u>Motor On/Off</u> button: Touch the button to toggle on/off the drive motor that turns the seed tray.

2. <u>Diverter Close</u> button: Touch the button to cycle the diverter baffle on the seed tray to its closed position. Press once more to return Diverter to its normal operating position.

3. <u>Cleanout Lower/Raise</u> button: Touch to toggle up/down position of the cleanout nozzle.

4. <u>Index Once</u> button: Touch the button to cause the carousel (if installed) to rotate forward one station. The number in the lower right hand corner of the button is the current envelope position. If the indexer is not connected, this button is not visible.

5. <u>Index to Remnant</u> button: Touch the button to cause the carousel (if installed) to rotate forward to the remnant position. If the indexer is not connected, this button is not visible.

6. <u>Indexer Home/Envelope</u> Load button: When the indexer is at the home position the Envelope Load is shown. When the indexer is at any other position Home Indexer is shown.

   a. [Home Indexer] Press to return indexer the home position.

   b. [Envelope Load] Press to index the carousel to allow envelopes to be loaded. The wait time is adjustable (see Timer Settings View page 46).

7. <u>Hopper Open/Close</u> button: Touch the button to toggle the hopper door open/close, controlling seed flow from the hopper onto the seed tray.

8. <u>Manual Air Puff</u> button: Touch the button to deliver the preset puff of reverse air into the inlet suction tube.

9. <u>Left Eye OK/Not OK</u> field: The field shows the status of the photo sensor on the count funnel outlet. "OK" means that the beam is blocked, as it would be when a container such as a bag or envelope is in position on the count funnel outlet. If this is true, it is now "OK" to start a count cycle. This is only visible when the Photo-Eyes Enabled selection is made in the Mode of Operation Setup. *Note: Carousel equipped machines must have photo-eyes disabled.

10. <u>Right Eye OK/Not OK</u> field: The field shows the status of the photo sensor on the cleanout funnel outlet. "OK" means that the beam is blocked, as it would be when a container such as a bag or envelope is in position on the cleanout funnel outlet. If this is true, it is now "OK" to start a cleanout cycle. This is only visible when the Photo-Eyes Enabled selection is made in the Mode of Operation Setup. *Note: Carousel equipped machines must have photo-eyes disabled.

11. Count Vac On: Touch to toggle the count vac valve on and off. The speed set in the calibration view is used when the count vac is on.

12. Empty Vac button: Touch to toggle the cleanout vacuum on and off.

13. R6 membrane switch: Press the membrane switch to return to the previous view.

To return to operation, be sure to leave the manual controls in the following state:

1. Motor = off.

2. Hopper = closed.

3. Diverter = open.

4. Cleanout = up.

5. Count Vac = off.

6. Empty Vac = off.

7. Carousel = home (station 1 aligned with count funnel).

2.5.16 Timer Settings view
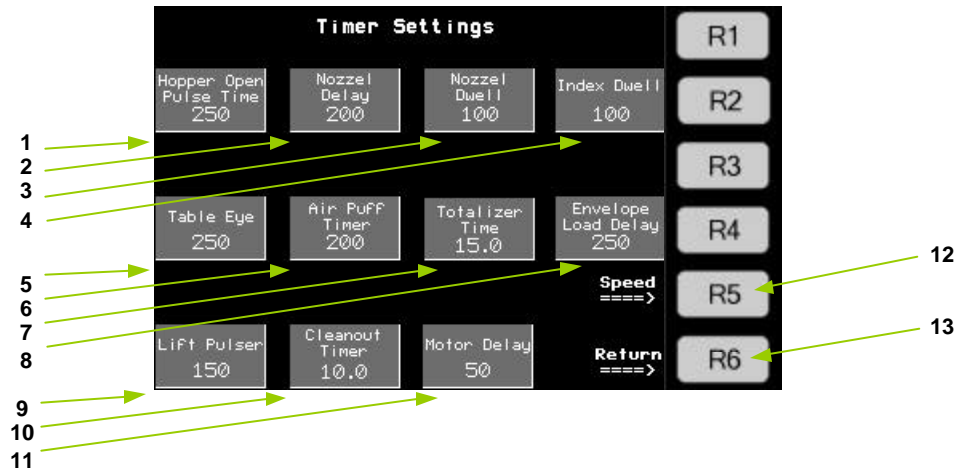
Timer Settings are required for optimized operation. These settings are globally set for the machine, and remain constant regardless of the cycle and batch definitions that are currently set, or are saved on the Speed and Threshold Settings view. Touch any button to access a numeric keypad where you can define the time of that specific element of the machine operation.

1. <u>Hopper Open Pulse Time</u> button: This is the time the hopper will be open to add more seeds to the seed tray. The hopper is opened for this amount of time when the <u>Table Eye</u> time is exceeded. Typical = 250.

2. <u>Nozzle Delay</u> button: This is the time the count sensor can go without seeing a seed before the machine assumes the inlet tube must be clogged. The machine will respond by shutting off suction in the inlet tube to allow the clog to break apart. Typical = 200.

3. <u>Nozzle Dwell</u> button: This sets the duration of the suction shutoff that the clogged state will produce. Typical = 100.

4. <u>Index Dwell</u> button: This is the time the carousel pauses after finishing filling the current envelope before it rotates the next envelope into position. This defines the time that the operator has to load a new envelope in the next empty station. Typical = 300, but may vary depending on specific seeds, and how long it may take the seeds to settle in the envelope. **Indexer equipped model only.

5. <u>Table Eye</u> button: This is the time that the table photo sensor can go without seeing seeds on the seed tray. This will trigger the hopper to open to add more seeds. Typical = 250.

6. <u>Air Puff Timer</u> button: This is the time of air puff to push seeds back towards the seed tray after the target count has been reached. This defines the duration of puff whether it is called for at the start of the count cycle, or after the cycle is done counting. Typical = 10.

7. <u>Totalizer Time</u> button: When running a count cycle, this is the time in seconds that the table photo sensor will allow no seeds to be seen on the seed tray before the machine concludes that all the seeds are gone. The machine will then stop the count cycle and batch. Typical = 15 seconds.

8. <u>Envelope Load Delay</u> button: This is the time allowed for loading envelopes when the Envelope Load button is pushed (Basic Run Envelope view or Advanced Run Envelope View). Increase this number to allow more time for loading envelopes. Typical = 500. **Indexer equipped model only.

9. <u>Lift Pulser</u> button: This is the time the cleanout nozzle will be raised, to prevent seeds piling up behind the cleanout nozzle. Typical = 10. Note: The interval between pulses remains constant, but the time raised is varied with this setting.

10. <u>Cleanout Timer</u> button: When running a cleanout cycle, this is the time in seconds that the table photo sensor will allow no seeds to be seen on the seed tray before the machine concludes that all the seeds are gone. The machine will stop the cleanout cycle. Typical = 10 seconds.

11. <u>Motor Delay</u> button: This is the time before the motor runs. This will eliminate rotation of the seed tray if a low number of seeds are to be counted, when simply turning on the suction will deliver enough seeds without rotating the seed table.

12. R5 membrane switch: Touch to go to the Speed Threshold view.

13. R6 membrane switch: Touch to return to the previous view.

2.5.17 Mode of Operation Setup view
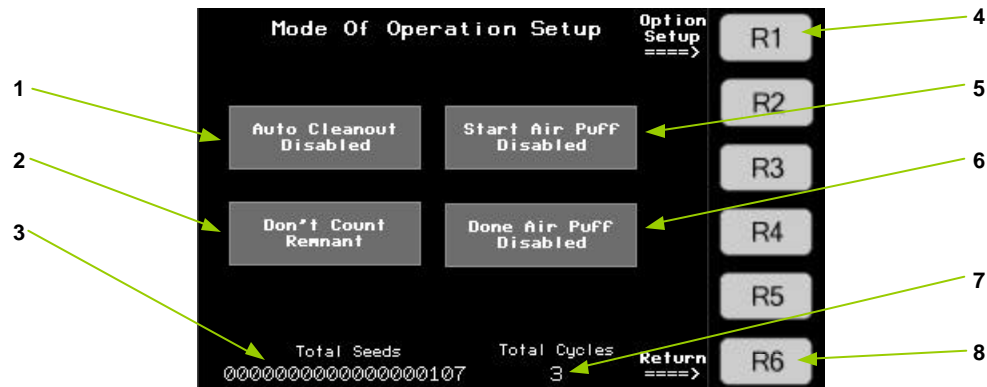
1. <u>Auto Cleanout</u> button: Touch to toggle between "enabled" or "disabled." When enabled, the machine will automatically move all seeds from the seed tray and hopper to the cleanout funnel after the defined cycle or batch has finished its counting.

2. <u>Remnant Count</u> button: Touch to toggle between "count" or "don't count". When count is selected, the machine will count and deliver all remaining seeds to the remnant station of the carousel. This is only used with the indexer. Cannot be used at end Batch mode counting.

Note: Count Remnant and Auto Cleanout are "End of Cycle" functions. Only on "End of Cycle" function can be enabled at a time. Thus enabling one will disable the other if it is enabled.

3. <u>Total Seeds</u> field: The total number of seeds the machine has counted.

4. <u>Option Setup</u> button: Touch to go to the Machine Option Selection Screen where machine options such as the scale and indexer are enabled and disabled.

5. <u>Start Air Puff</u> button: Touch to toggle between "enabled" or "disabled." When enabled, a puff of air will occur at the beginning of a count cycle to push seeds approaching the count sensor back towards the seed tray. The amount of the force is set on the Timer Settings view. Both Start Air Puff and Done Air Puff may be used with a count cycle, to increase the certainty that the count tube has been purged of any foreign material.

6. <u>Done Air Puff</u> button: Touch to toggle between "enabled" or "disabled." When enabled, a puff of air will occur at the end of a count cycle to push seeds approaching the count sensor back towards the seed tray. The amount of the force is set on the Timer Settings view. Both Start Air Puff and Done Air Puff may be used with a count cycle, to increase the certainty that the count tube has been purged of any foreign material.

7. <u>Total Cycles</u> field: The total number of machine cycles. Complete cycles are logged after done counting and totalizing.

8. R6 membrane switch: Press to return to the previous view.

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2.5.18 Bag Calculator View
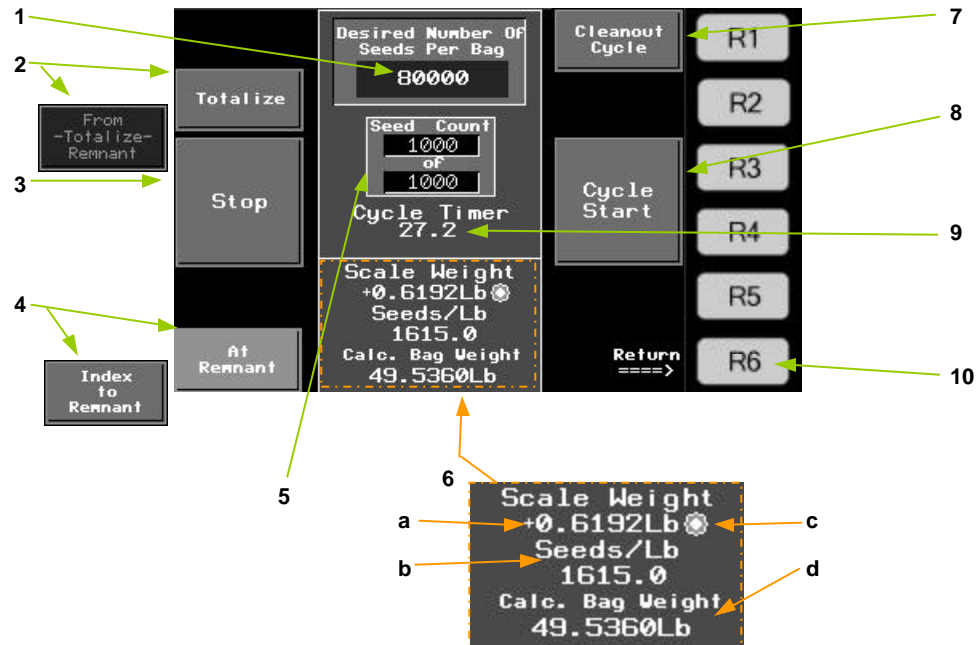
In a production situation, bags are often filled by weight, with that weight intending to deliver a specific seed count to the customer. Use the Bag Calculator view to count and weigh (seeds/pound) a sample of the seeds. The bag calculator cycle will know how many seeds have been counted in the sample, and know the total weight of those seeds. The machine will then report the theoretical weight of a bag containing the target number of seeds. The calculation will be increasingly accurate as the sample size becomes larger. This feature requires that the machine is equipped with the scale option.

1. Desired Number of Seeds Per Bag button and display: Touch to access a numeric keypad to enter the target number of seeds that you wish to count into each bag.

2. Totalize button or From Remnant Totalize indicator: When totalize button is visible touch to count how many seeds remain in the hopper and on the seed tray. If From Remnant Totalize is shown (indexer equipped models only) move indexer to the remnant station using the "Index to Remnant" button (4).

3. Stop button: Touch to stop a running count or totalize cycle.

4. Index to Remnant button or At Remnant display: Visible when indexer is connected. Touch to move indexer to the Remnant position. The totalize function can only be initiated from the Remnant station when the indexer is connected. Count cycles can be initiated from any indexer position.

5. Seed Count field and button: Touch to access a numeric keypad to enter the desired count. The field shows the current actual value of seeds counted over the desired count.

6. Scale Display: This display shows live seed weight and seeds per/X and Bag Weight in "Y" (where "X" and "Y" is the units selected in the Scale Display Setup view (page 55). Default units are pounds (Lb).

   a. Seed weight in the units selected in Scale Display Setup view (page 55).

   b. Seeds per/unit selected in Scale Display Setup view (page 55). Calculated from the sample weight on the scale.

c. Stable indicator. Displays when scale has settled and is displaying a stable weight.

d. Calculated bag weight based on the desired number of seeds entered with the units selected in Scale Display Setup view (page 55). The field shows the weight of one bag once it is filled with the number of seeds selected, based on the known weight of seeds counted.

Note: Live seeds/X and Bag Weight calculations (while seeds are still dropping) are approximate and thus not accurate until the Stable indicator is displayed and the last seeds have dropped.

7. Cleanout Cycle button: If desired, touch to start a cleanout cycle, which will move all seeds in the hopper and seed tray to the cleanout funnel. If the sensor for the cleanout funnel is enabled, the machine will not run the cleanout cycle unless a container is in position to catch the output of the cleanout funnel.

8. Cycle Start button: Touch to run one count cycle with the current settings.

    After cycle has been started, the button has the following two states:

    1. Pause Button: Touch to pause the current batch. The foot switch (if connected) can also be used to pause counting.

    2. Resume Button (flashes): Touch to resume a pause counting. The foot switch (if connected) can also be used to resume counting.

9. Cycle Timer field: The field shows the time in seconds that was last required to run one cycle.

10. R6/Return button: Stops current cycle (if running) and returns to the previous screen.

Procedure to utilize the bag weight calculation view

There are two ways to utilize the bag weight calculation. Method 1 is to count a desired number of seeds and use the count and weight of the sample for the calculations. Method 2 is to totalize an unknown number of seeds and utilize the count and weights.

2.5.18.1 Method 1, Sample Count:

*Note: If machine is equipped with the carousel option, samples must be counted into an envelope, then moved to the scale to perform the calculations.

1. Place empty sample container on the scale, centered under the count funnel, and make sure that scale shows zero. If it does not press the red Re-Zero button (On the scale itself).

2. Touch the Desired Number of Seeds Per Bag button. On the numeric keypad, enter the desired number of seeds that are intended to be put into one production bag.

3. Touch the Seeds Count button. On the numeric keypad, enter the desired sample size to be tested. Larger samples yield more accurate measurements.

4. Touch the Cycle Once button. The machine will count the target number of seeds. Even if the actual count is slightly different from the target sample size, the calculation of seeds/pound will be accurate, based on the actual weight of the actual number of seeds count ed. Do not touch the scale or the container while the weight cycle is running.

Once the last seeds have settled and the stable indicator (6c) is lit, the calculations are ready.

2.5.18.2 Method 2, Totalize:

*Note: If machine is equipped with the carousel option, samples must be counted into an envelope or container, and then moved to the scale to perform the calculations. Totalize can only be performed from the remnant position on carousel equipped models.

1. Place empty sample container on the scale and make sure that scale shows zero. If it does not press the red Re-Zero button. If machine has the carousel option move the sample container to the remnant position.

2. Touch the Totalize button to start. All seeds will be sucked up and placed in the container under the count funnel.

Once the last seeds have settled and the stable indicator (6c) is lit, the calculations are ready.

2.5.19 Machine Option Setup view
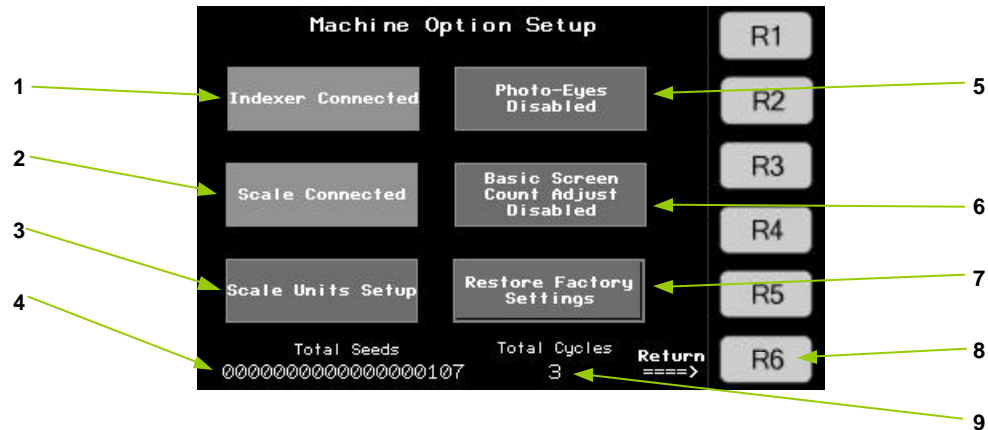
V05

Use this view to define how your machine is setup. Optional components such as the scale and indexer are enabled here. The scale and indexer functions are factory enabled if the unit is so equipped.

1. Indexer Connected / Indexer Not Connected button: Touch to toggle between "Connected" and "Not Connected". When "Connected", you are telling the machine that the carousel is installed and ready to run.

2. Scale Connected / Scale Not Connected button: Touch to toggle between "Connected" and "Not Connected". When "Connected", you are telling the machine that the scale has been installed and ready to run. Scale related displays and functions are shown and enabled.

3. Scale Units Setup button: Touch to go to the Scale Units Setup view where you can change the scale units shown on all screens. This button is only shown when "Scale Connected".

4. Total Seeds field: The total number of seeds the machine has counted.

5. Photo-Eyes Enabled / Photo-Eyes Disabled button: Touch to toggle between "enabled" or "disabled." This option monitors whether a receiving container is in place to catch counted seeds. When enabled, the photo sensors on the count and cleanout funnel outlets are activated, and the machine will not run a count or cleanout cycle until the beam is blocked (as it would be when a container such as a bag or envelope is in position on the output of the funnel). **The machine will not run in the carousel mode**, however, if the photo eyes are enabled.

6. Basic Screen Count Adjust Enabled/Disabled button: Touch to toggle between "enabled" or "disabled". This option allows the changing of the count and batch or envelope quantities from the Basic Run Screen. When enabled, count values can be changed when the cycle is not running. When disabled, values can only be changed from either the Machine Option Selection screen or the Advanced Run Screen.

7. Restore Factory Settings button: Touch to go to the Restore Factory Settings view (see page 54) where original factory settings may be applied. When you suspect that some corruption or change of the settings of the machine may have occurred, and efforts to make corrections have failed to solve problems, you can return the machine to its original settings. Doing this, however, will replace any customized settings with the original settings.

8. R6 membrane switch: Press to return to the previous view.

9. Total Cycles field: The total number of machine cycles. Complete cycles are logged after done counting and totalizing.

## 2.5.20 Restore Factory Default Values view

V09

Caution: All customized settings will be lost and are non-recoverable. Record any settings before pressing the "Restore Factory Settings Button" that you wish to re-enter after the reset.

1. Restore Factory Settings button: Touch the button if you are sure you want to return the settings of the machine back to their original manufacturer's settings. Any customized settings will be lost.

2. R6 membrane switch: Press R6 return to the previous view.

2.5.21 Scale Display Setup view
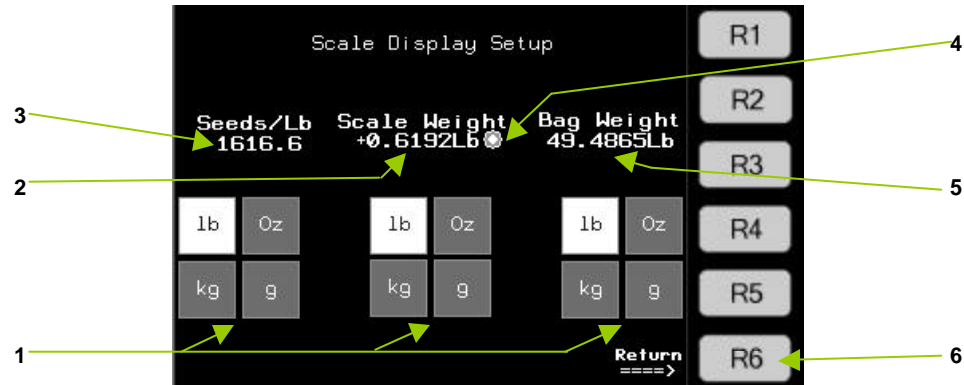
This screen is used to change the weight units of measure used globally on the machine. The default units are pounds (lb). Each of the three different displays can use a different unit of measure.

1. Unit of measure selection buttons/display. Touch the desired unit of measure for each of the three displays. This will change the units of measure for each of the displays directly above each group of buttons.

***Note**: The display does not update until the scale or count value has changed. Lightly pressing on the scale will update these displays with the new unit of measure selection.

2. Scale weight: this is the scale weight converted to the desired unit of measure selected below this display.
3. Seeds Per X: this is the calculated seeds per X where X is the units of measure selected below this display.
4. Stable indicator.   Displays when scale has settled and is displaying a stable weight. *Note: All of the displays will calculate and update in real-time. However, the values are not accurate until the last seeds have dropped and the stable indicator is shown.
5. Bag Weight: This is the calculated bag weight based on the setting in the bag calculator screen (See page 50).
6. (R6) Membrane button: Press to return to the previous screen.

2.5.22 Numeric Keypad view

P01

When any button is touched that requires a numeric value to be defined, the numeric keypad will appear. Touch the numeric buttons as needed to alter the displayed number on the top field. Touch the Enter button to accept the number and return to the previous view.

1. Numeric Value Display field: The field will show the numeric value that has been entered.

2. Esc button: Touch to cancel any pending setting, and return to the previous view without changing the current value.

3. < button: Touch to move the cursor to the left in the displayed value.

4. +/- button: This standard view includes the +/- button, but a negative value will not allow this machine to run properly. Do not create a negative value.

5. 0-9 numeric buttons: Touch the respective button to define the numeric value added in the field on the top line.

6. ← button: Touch to erase the character to the left of the cursor.

7. > button: Touch to move the cursor to the right in the displayed value.

8. Clr button: Touch to erase the entire value displayed in the top line.

9. Enter button: Touch to accept the value displayed in the top field, replacing any current value that is being edited with this new value. The previous view will automatically return to the screen.

3. TECHNICAL SPECIFICATIONS

3.1 Dimensions.
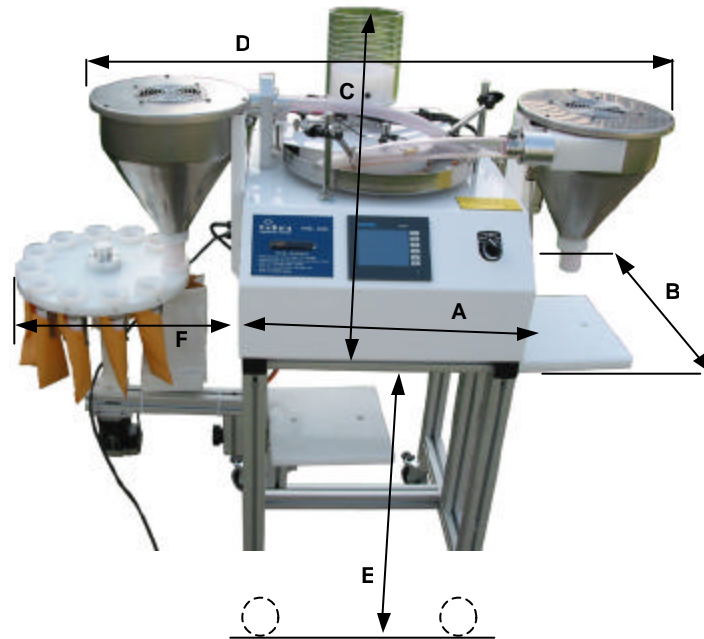
A: 455 mm (18 inches)

B: 485 mm (19.5 inches)

C: 685 mm (19 inches)

D: 965 mm (38 inches)

E: 680 mm (26.75 inches)

F: 406 mm (16 inches)

3.2 Weight.

Machine fully assembled..35 kg (80 pounds)

3.3 Materials.

Exterior metal is stainless steel; white plastic is Delrin.

3.4 Electrical system.

Supply voltage.....................120 V, 60 Hz

System fuse.........................3 A

Gearmotor ....1/85 hp(01 kW), 12 rpm

Overload protection for the motor is incorporated into the machine.

3.5 Air system.

Supply pressure: .... 550-700 kPa (80-100 psi)

Quality:..clean, dry, non-lubricated

Consumption:..140 liters/minute (5 scfm)

Inlet port: ....1/4-18 NPT (internal)

3.6 Airborne noise.

When the flow control air valve for the cleanout air is properly adjusted, normal operation does not exceed 70 dB(A).

If the noise level exceeds 70 dB(A), reduce the flow of air through the cleanout flow control valve until the noise level is below 70 dB(A).

4. MAINTENANCE

4.1 Sensitivity control – returning to factory settings.

If you suspect you may have accidentally altered essential factory setup of the sensitivity control, do the following to return to factory settings.

1. With power turned on, open the cover on the sensitivity control.

2. Press and hold both dynamic (+) and static (-) buttons simultaneously. When the arrow icon turns red, you are in the sensor setup mode.

3. Click the dynamic (+) button until the display flashes "do" (for "dark operate"), and then click the static (-) button to accept and advance to the next setting.

4. Click the dynamic (+) button until the display shows "t 0" (for "OFF-Delay), and then click the static (-) button to accept and advance to the next setting.

5. Click the dynamic (+) button until the display shows "1234" (for "raw signal value"), and then click the static (-) button to accept and advance to the next setting.

6. Click the dynamic (+) button until the display shows "SHS" (for "Super High Speed"), and then click the static (-) button to return to the run mode.

7. Before counting specific seeds, you must adjust sensitivity for that specific type of seed. See page 12.

4.2 Setup of Envelope Operation (with carousel)
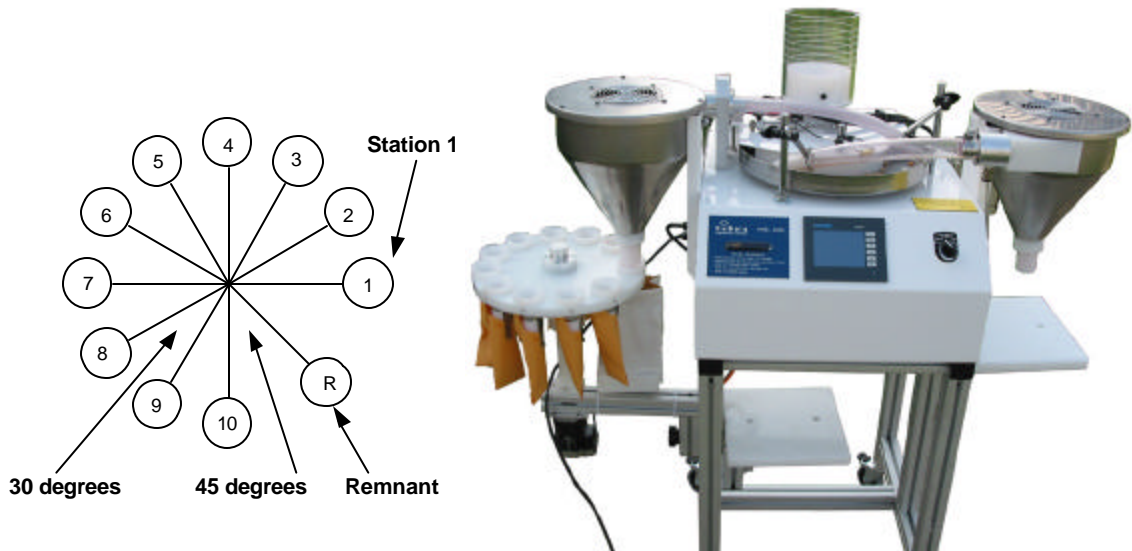
1. Attach the carousel mounting bracket to the base stand as shown above. The clearance between the count funnel and the carousel housing should be 1 mm (1/32 inch).

2. With the power turned off, position station number one directly under the count funnel outlet.

3. With the carousel in that position, check that the proximity sensor is centered on the trip screw under the carousel top plate. The gap between the trip screw and sensor should be 1/32 inch. (1 mm)

4. Connect the carousel electrical cable to the main cabinet.

4.3 Setup of Normal Operation (without carousel)

1. Attach the support platform to the base stand as shown above.

2. Position the vertical location to accommodate the containers that you will be using.

3. The containers must be held in a position high enough to cover the reflective tape on the side of outlet of the count funnel (if equipped with photo-eyes).

4.4 Setup of scale option

1. To operate with the scale option, your machine must be equipped with the required electronic circuit for the option.

2. Attach the support platforms (count and cleanout) to the base stand as shown above.

3. Position the vertical location of the platforms to accommodate the containers that you will be using, including the height of the scale.

4. The containers must be held in a position high enough to cover the reflective tape on the side of outlet of the count funnel.

5. Connect the cable from the scale to the main cabinet.

5. TROUBLESHOOTING

5.1 Indexer

Symptoms	Probable Cause	Recommended Action
Indexer Won't Home (indexer turns 2 revolutions and stops)	a. Home switch not being tripped by flag	a. Adjust home switch
	b. Home switch not functioning	b. Check wiring / replace switch if necessary
Indexer Won't Home (indexer does not turn)	a. Indexer not plugged in	a. Make sure indexer cable is plugged in to cabinet
	b. Indexer mechanism is tight	b. Indexer must freely move when power is not present. Check for mechanical binding, Contact dealer or Dubois Engineering Co. for service.
Indexer moves erratic or jerky	a. Indexer mechanism is out of alignment	a. Indexer must freely move when power is not present. Check for mechanical binding, Contact dealer or Dubois Engineering Co. for service.
Indexer not lined up below count funnel outlet once homed. All positions off by the same amount.	a. Home switch not aligned correctly	a. Adjust home switch
Indexer lined up at the home position but not at other stations	a. Indexer mechanism is tight	a. Indexer must freely move when power is not present. Check for mechanical binding, Contact dealer or DuBois Engineering Co. for service.

5.2 Counting

Symptoms	Probable Cause	Recommended Action
Actual count is higher than count desired	a. Sensor is not sensitive enough to count seeds	a. Make count sensor window smaller
	b. Count nozzle is too large for seed being counted	b. Reduce count nozzle size to 1/8" larger than seed counted

Symptoms	Probable Cause	Recommended Action
	c. Speed setting is too high	c. Reduce speed setting until count is accurate
Actual count is less than count desired	a. Sensor is too sensitive	a. Make count sensor window larger
Totalize count is higher than count made in a normal batch or envelope count	a. Maximum speed is too high	a. Lower maximum speed in Speed and Threshold settings
Machine pauses and displays Sensor Blocked	a. Dirty sensor lens	a. Clean sensor lens, display will go out when condition has been cleared
	b. Seed(s) stuck and is blocking sensor beam	b. Removed stuck seed(s)
	c. Sensor set too sensitive	c. Re-Adjust sensor

6. SUBJECT INDEX

7. WARRANTY

All machines manufactured by DuBois Engineering are guaranteed to be free of defects in workmanship and materials for a period of 12 months (1 year) from the date of purchase.

All parts are covered during this time with the exception of (1) the lens of the count sensor, (2) consumables, and (3) parts subject to replacement due to normal wear or recommended periodic maintenance. Labor or production losses are not covered.

All claims must be made in writing and include a description of the failure, part number, and machine serial number. After approval of the claim is made, the defective part must be returned for credit.

This warranty is valid only if genuine DuBois Engineering parts are used without modification.