



Belt Planter Controls

QUICK REFERENCE



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1. Standard Controls

This section applies to the following Spudnik belt planter models: 8904, 8906, and 8908.

IMPORTANT This Quick Reference documents the operation of software version S4N 2.07 with controls set to the default position. Depending on the software version and control installation location, actual operation may differ. Confirm the installed software matches the documented software.

WARNING! Before testing, alert all personnel who are on and/or around the belt planter. Unexpected activation of equipment could result in severe injury or death.

1.1. Home Screen

The CCI is powered on/off using the tractor ignition key (assuming the CCI is connected correctly and turned on). At the completion of the power-on boot sequence, the CCI displays the Home screen. The Home screen contains function controls, status information, and keys used to access additional screens. (see [Figure 1](#))

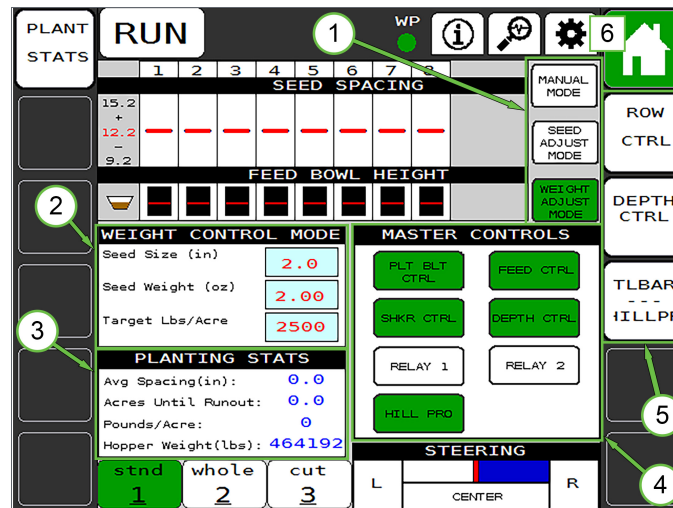


Figure 1

Located on the (1) top right of the Home screen are three mode keys. *MANUAL MODE* allows the operator to set values for seed size and spacing. In this mode, the belt planter operates using the set values without adjustment, and functions in a manner similar to a cup planter. *SEED ADJUST MODE* monitors seed size and automatically adjusts seed spacing based on average seed size detected. *WEIGHT ADJUST MODE* monitors how quickly the weight of the seed hopper decreases and adjusts the rate at which seed is fed to the belts to meet the targeted lbs/acre of planted seed. This mode also automatically adjusts *Seed Weight* based on changes in hopper weight.

Touch a key to activate the desired mode. The key turns green, indicating the belt planter is operating in the selected mode.

In Weight Adjust mode, specify *Seed Size*, *Seed Weight*, and *Target Lbs/Acre* in the (2) *WEIGHT CONTROL MODE* section. To input a value, touch the value field (cyan shaded box) or select it with the selector knob. A keypad opens. (see [Figure 2](#))



Figure 2

Input the desired value and touch OK to save. Touch ESC to cancel without saving. Based on input values, the belt planter will automatically calculate and adjust planting rate to meet the target lbs/acre.

Basic planting statistics are displayed in the (3) PLANTING STATS section. Additional planting statistics are displayed on the [Planting Stats](#) screen. Note that a hopper weight of "464192" is the default value displayed when there is no input from the hopper weight sensors.

Function keys for each of the major belt planter functions are located in the (4) MASTER CONTROLS section of the screen. Touch a function key to activate all controls associated with that function. The key turns green. To enter test mode, touch and hold the key until it turns blue. A beep sounds and test mode activates. The function runs in test mode until the key is touched again. Note that test mode only functions if ground speed is zero.

Access a function screen by touching the associated key in the (5) column on the right side of the screen, or by pressing the associated soft key on the right edge of the CCI display.

Touch the (6) Settings key (see [Figure 1](#)) to access the Home settings screen. (see [Figure 3](#))

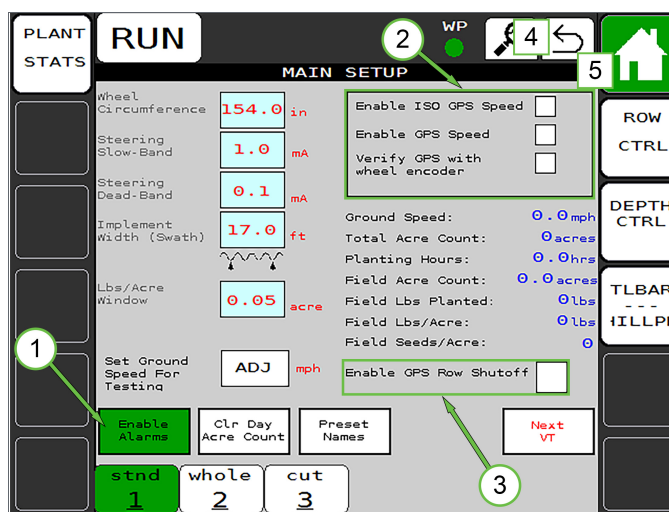


Figure 3

Touch the (1) *Enable Alarms* key to enable audible alarms for no seed detect, seed spacing, and feed bowl height. The *Enable Alarms* key is green when alarms are enabled.

Three GPS functions are listed at the (2) top right of the screen. Touch the box to the right of the desired GPS function to enable that function. *Enable ISO GPS Speed* inputs speed from the tractor GPS to the S4 control board on the belt planter via a wired connection to the tractor's ISOBUS. *Enable GPS Speed* inputs speed from a GPS receiver located on the belt planter directly to a designated terminal block located in the S4 control board cabinet.

Verify GPS with wheel encoder inputs speed from the wheel encoder if the GPS signal is lost or if there is a large difference between the GPS speed and wheel encoder speed. When (3) *Enable GPS Row Shutoff* is active, all row units or sections of row units are turned off when the GPS boundary is crossed, depending on how the belt planter is configured.

Touch the (4) Return key or (5) Home key to return to the Home screen.

1.2. Row Control

The Row Control function screen contains information and controls for seed spacing, feed bowl height, and shakers. (see [Figure 4](#))

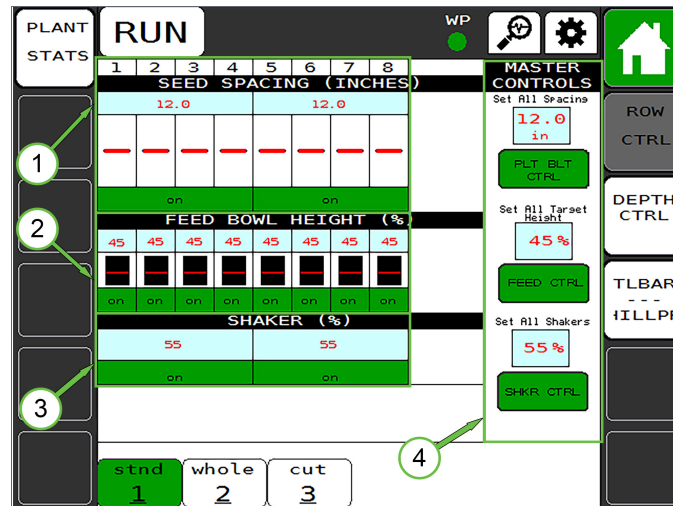


Figure 4

The (1) *SEED SPACING* graph displays seed spacing settings (red numbers and lines) and actual values (shown in blue). The (2) *FEED BOWL HEIGHT* graph indicates the level of seed (setting and actual) in the feed bowl for each row unit (1-8) as a percentage of the feed bowl capacity. The (3) *SHAKER* display indicates the shaker speed as a percentage of the maximum setting. To adjust a setting, touch the desired value field in the (4) *MASTER CONTROLS* section. A keypad opens. Input the desired value and touch *OK* to save. Touch *ESC* to cancel without saving.

Touch the key below each value field (i.e., *PLT BLT CTRL*, *FEED CTRL*, *SHKR CTRL*) to toggle the corresponding function on/off. The key is green when the function is active, and the *on* indicators turn green in the corresponding graph and status display sections on the left. To enter test mode, touch and hold a function key in the *MASTER CONTROLS* section, or any *on* key in the *SEED SPACING*, *FEED BOWL HEIGHT*, or *SHAKER* sections, until the key turns blue. A beep sounds and test mode activates. The function runs in test mode until the key is touched again. Note that test mode only functions if ground speed is zero.

Touch the Settings key on the top right to access the Row Control settings screen. (see [Figure 5](#))

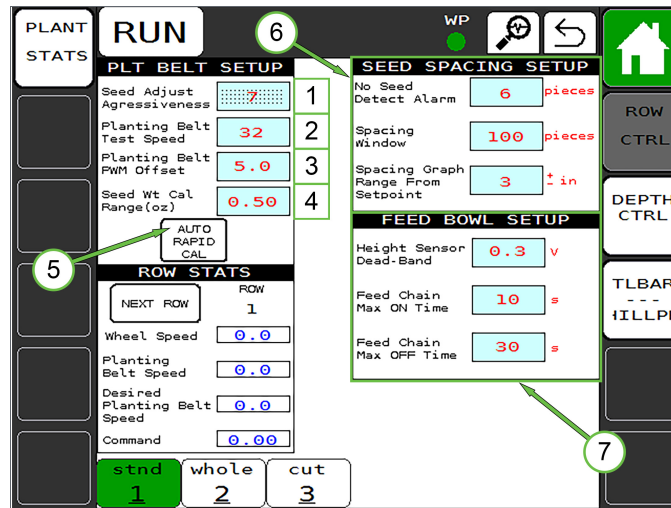


Figure 5

There are four settings which are adjusted in the *PLT BLT SETUP* section: (1) *Speed Adjust Aggressiveness*, (2) *Planting Belt Test Speed*, (3) *Planting Belt PWM Offset*, and (4) *Seed Wt Cal Range (oz)*. The (5) *AUTO RAPID CAL* key is non-functional.

Speed Adjust Aggressiveness indicates, on a scale of 1 to 10, how quickly the planter adjusts to changes in seed size to maintain the desired seed spacing. This setting is not adjustable in Manual or Weight Adjust mode, as indicated by a block of dots displayed on top of the value field while in those modes.

Planting Belt Test Speed indicates the speed at which belts will run in test mode. The number displayed is the PWM percentage. Adjust this setting down/up to decrease/increase belt speed.

Planting belt PWM Offset is used to increase or decrease the responsiveness of the planter at start of row and end of row. Adjust this setting to ensure that planting starts or stops without delay, even as the belt control valves heat up during operation. If the value is too high, this setting may prevent the belt planter from achieving desired spacing at low ground speeds.

Seed weight calculation range is the maximum deviation (plus or minus) allowed from the user-input seed weight value used for seed weight calculations.

In the (6) *SEED SPACING SETUP* section, the *No Seed Detect Alarm* setting is the time equivalent of a specified number of seed pieces (in this case, 6 seed pieces) not going by the sensor. If that occurs, an alarm is triggered. The *Spacing Window* setting is the number of pieces used to calculate the rolling average for seed spacing. The *Spacing Graph Range From Setpoint* setting is the range (in inches) displayed on the Speed Spacing graph on the Row Control function screen. (see [Figure 4](#))

In the (7) *FEED BOWL SETUP* section, the Max ON and Max OFF values control the length of time during which the feed chain runs to fill the feed bowl or stops to allow the feed bowl to empty. Adjust these values, as necessary, to maintain a consistent level of seed in the feed bowls during planting operation. The *Height Sensor Dead-Band* setting is the allowable plus/minus range from the setpoint. This does not typically require adjustment. For questions regarding dead-band settings for row control and other functions, contact your Spudnik Customer Service Representative

1.3. Depth Control

The Depth Control function screen displays setpoints and actual distances for left and right row units. Numbers, lines, and bars indicate distance from the ultrasonic depth sensors to the ground. (see [Figure 6](#))

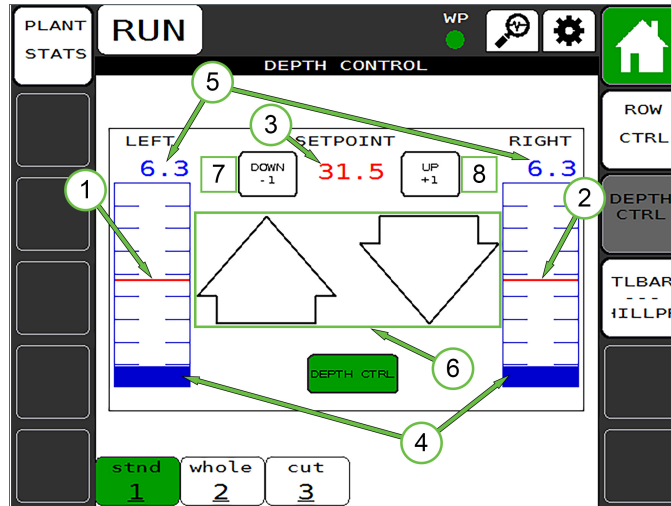


Figure 6

The (1,2) red lines and (3) red number indicate the setpoint (displayed as inches). The (4) blue bars and (5) blue numbers indicate actual values. Touch and hold the (6) up or down arrows to adjust the cylinder stroke and update cylinder position. Touch the (7) *DOWN -1* key or (8) *UP +1* key to adjust the setpoint incrementally. To enter a specific value, touch the (3) setpoint number and input the desired value using the keypad that opens.

Touch the Settings key on the top right to access the Depth Control settings screen. (see [Figure 7](#))

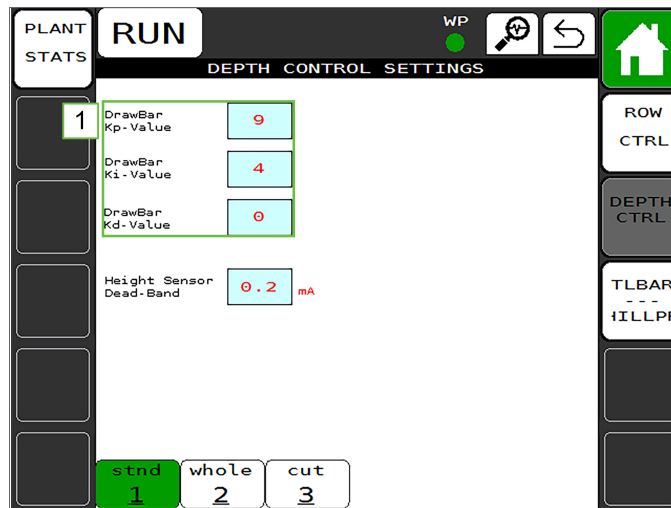


Figure 7

The (1) PID values are used for tuning the Depth Control function. These values are set at the factory. For questions regarding these values, contact your Spudnik Customer Service Representative.

1.4. Toolbar and Hill Pro

The Toolbar and Hill Pro function screen includes gauges and controls for toolbar position and Hill Pro function. (see [Figure 8](#))

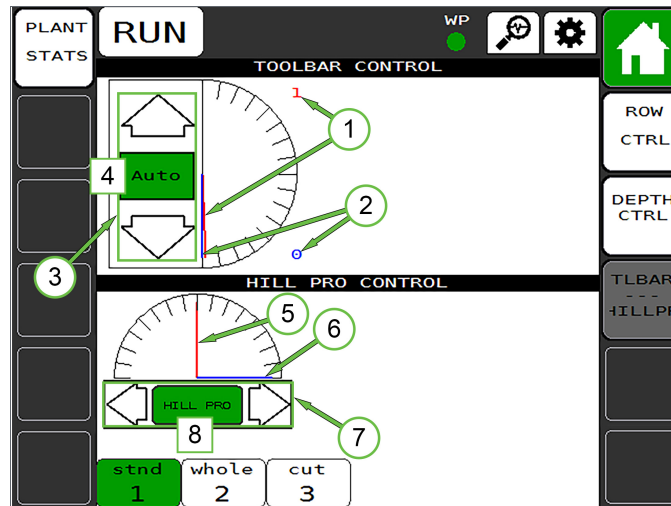


Figure 8

An angle sensor at the toolbar pivot point provides input to the *TOOLBAR CONTROL* gauge. The (1) red setpoint value and red gauge line indicate the toolbar height setpoint in inches. The (2) blue number and gauge line indicate current toolbar height. To save a toolbar height setpoint, adjust toolbar height using the (3) up and down arrows until the toolbar is in the desired position. Then, touch and hold the (4) *Auto* key until it beeps. A green *Auto* key indicates that the toolbar will go to the setpoint.

The Hill Pro function keeps row units in the same position (typically level), whether the belt planter is going uphill or downhill. This maintains a constant and consistent supply of seed, regardless of the pitch of the field. The (5) red gauge line and (6) blue gauge line indicate setpoint and actual values for the Hill Pro function, respectively. Adjust the Hill Pro setpoint using the (7) left and right arrows. Then, touch and hold the (8) *HILL PRO* key until it beeps. A green *HILL PRO* key indicates that Hill Pro will go to the setpoint.

Touch the Settings key on the top right of the Toolbar and Hill Pro function screen to access the Toolbar and Hill Pro settings screen. (see Figure 9)

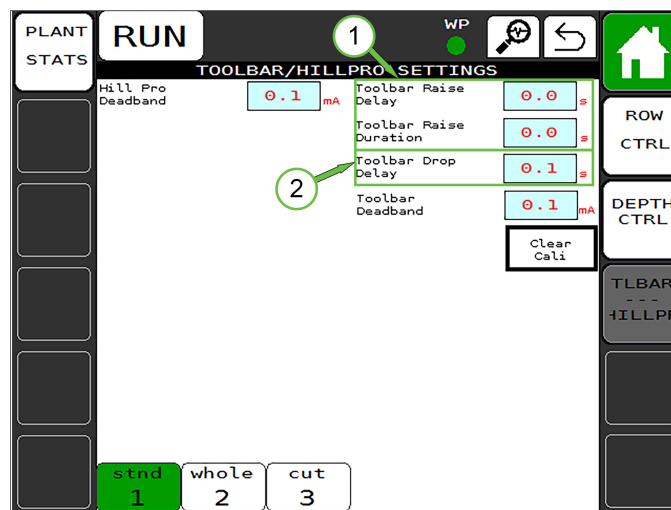


Figure 9

On the Toolbar and Hill Pro settings screen, use (1) *Toolbar Raise Delay* and *Toolbar Raise Duration* to adjust when and how quickly (in seconds) the toolbar raises at end of row. Use (2) *Toolbar Drop Delay* to adjust when the toolbar drops at start of row.

1.5. Planting Stats

The Planting Stats screen is accessed by touching the *PLANT STATS* key on the top left of the Home screen, any settings screen, or any function screen. The Planting Stats screen displays average seed spacing, as well as other statistics related to seed characteristics and planting operation. (see [Figure 10](#))

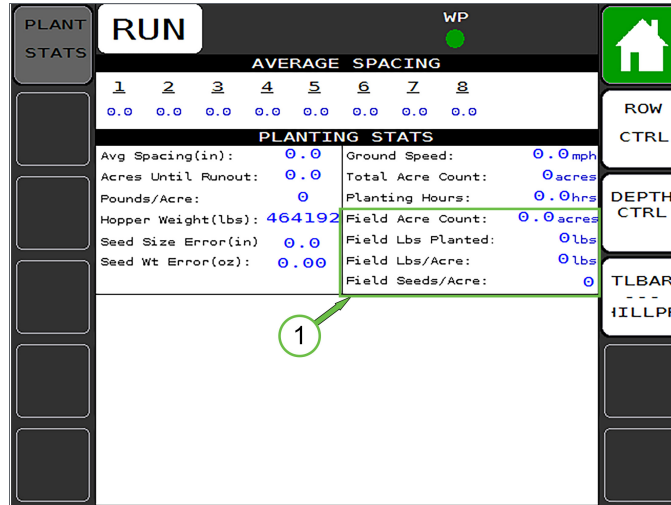


Figure 10

To reset (1) field values touch the *Clr Day Acre Count* key near the bottom center of the Home settings screen. (see [Figure 3](#))

2. Dry Fertilizer Configuration

This section applies to the following Spudnik belt planter model, in Dry Fertilizer configuration: 8906.

IMPORTANT This Quick Reference documents the operation of software version S4N 2.07 with controls set to the default position. Depending on the software version and control installation location, actual operation may differ. Confirm the installed software matches the documented software.

WARNING! Before testing, alert all personnel who are on and/or around the belt planter. Unexpected activation of equipment could result in severe injury or death.

2.1. Home Screen

In Dry Fertilizer Configuration, the Home screen includes (1) *CHEM./FERT.* function and *FERT CTRL* master control keys, in addition to (2) *START ROW* and *END ROW* keys. (see [Figure 11](#))

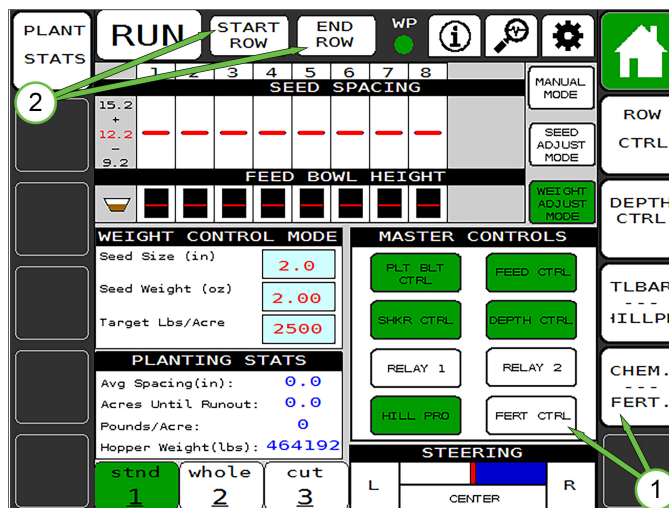


Figure 11

Touch the *START ROW* key to activate the Start of Row sequence or the *END ROW* key to activate the End of Row sequence. The keys turn green and remain green until the sequence ends. The keys turn white once the sequence ends.

The Dry Fertilizer Configuration, Home settings screen includes the (1) *Start/End of Row Setup* key. Touch the key to open the Start/End of Row Setup screen. (see [Figure 12](#))

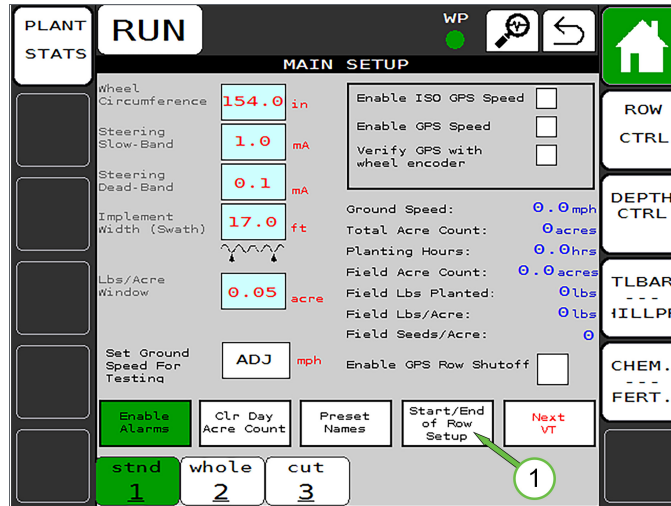


Figure 12

2.2. Start and End of Row

On the Start/End of Row Setup screen, adjust the seed delay settings to control the delay between fertilizer dispensing start/stop and seed planting start/stop at the start and end of rows. (see Figure 13)

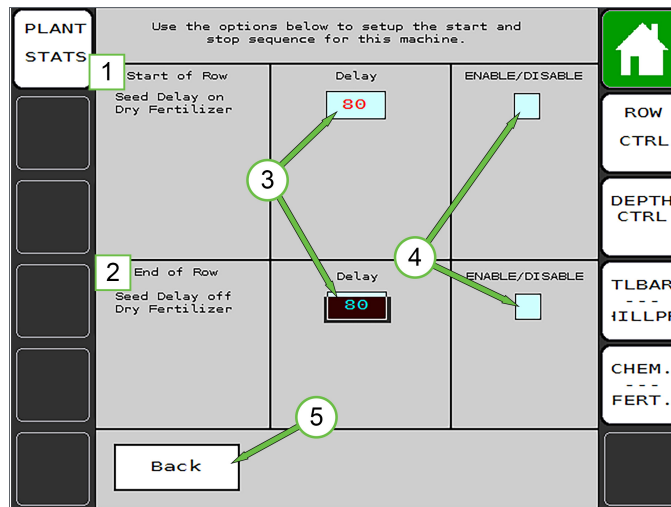


Figure 13

Delay is displayed in the (3) Delay fields. The delay is displayed in inches. Touch the fields to adjust the delay value. At start of row, a delay of 80 inches indicates that the belt planter will travel 80 inches after fertilizer dispensing begins before seed planting begins. At end of row, a delay of 80 inches indicates that the belt planter will travel 80 inches after fertilizer dispensing stops before seed planting stops.

Touch the (4) *ENABLE/DISABLE* boxes to enable/disable the start/end of row delays.

Touch the (5) *Back* key to return to the Dry Fertilizer Configuration, Home settings screen.

2.3. Chemical and Fertilizer

Use the Chemical and Fertilizer function screen to enable fertilizer dispensing and adjust the dispensing rate in lbs/acre. (see Figure 14)

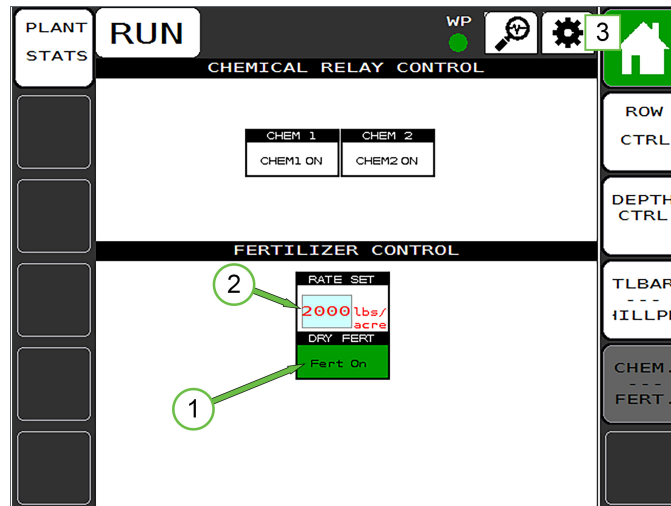


Figure 14

Touch the (1) *Fert On* key to enable fertilizer dispensing. To run the function in test mode, touch and hold the *Fert On* key until it turns blue. A beep sounds and test mode activates. The function runs in test mode until the key is touched again. Note that test mode only functions if ground speed is zero.

The current fertilizer dispensing rate is displayed in the (2) *RATE SET* field. Touch the field to open a keypad and adjust the rate.

Touch the (3) Settings key to access the Chemical and Fertilizer settings screen. (see [Figure 15](#))

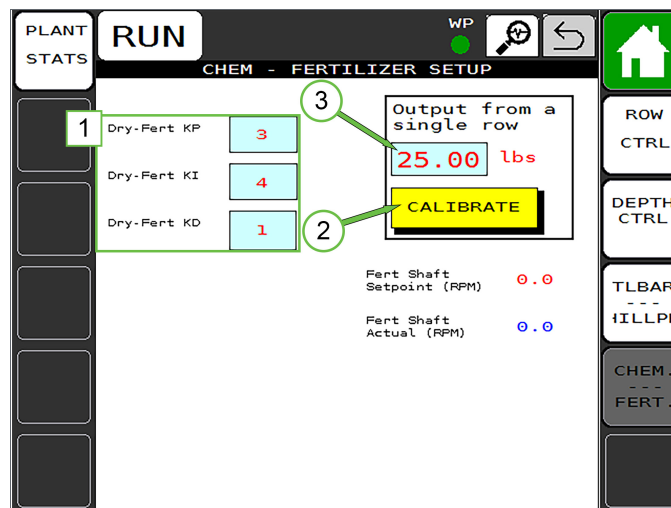


Figure 15

The (1) PID values are used for tuning the Dry Fertilizer function. These values are set at the factory. For questions regarding these values, contact your Spudnik Customer Service Representative.

Use the (2) *CALIBRATE* key to calibrate the quantity of fertilizer dispensed, in the following manner:

1. Place a bucket under a row unit.
2. Touch the *CALIBRATE* key. The key turns green and the row unit will begin dispensing fertilizer.
3. Allow the row unit to dispense fertilizer for 10 cycles (the motor shaft spins 360 degrees ten times).
4. Touch the *CALIBRATE* key again to stop fertilizer flow. The *CALIBRATE* key turns yellow.
5. Weigh the fertilizer in the bucket and input the value in the (3) *Output from a single row* field.

3. Bed Belt Planter Settings

This section applies to the following Spudnik bed belt planter models: 8946 and 8947.

IMPORTANT This Quick Reference documents the operation of software version S4N 2.08 with controls set to the default position. Depending on the software version and control installation location, actual operation may differ. Confirm the installed software matches the documented software.

WARNING! Before testing, alert all personnel who are on and/or around the belt planter. Unexpected activation of equipment could result in severe injury or death.

3.1. Home Screen

The Home screen for Spudnik bed belt planters includes (1) *START ROW* and *END ROW* keys at the top of the screen, and a (2) *FEED CTRL* key for accessing the Feed Control function screen on the bottom right. (see [Figure 16](#))

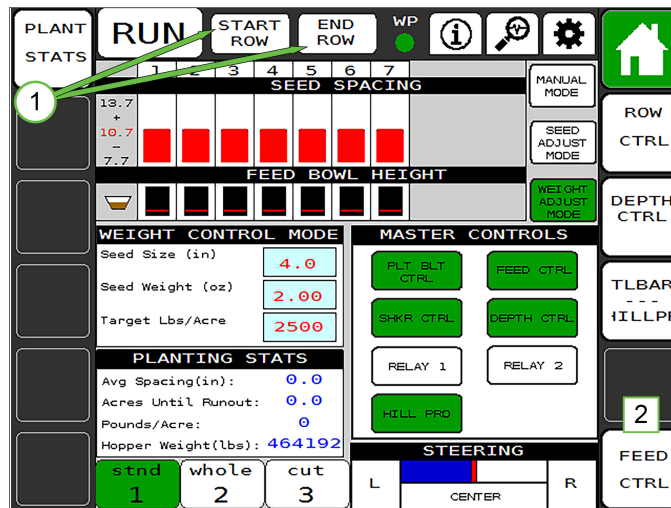


Figure 16

Touch the *START ROW* key to activate the Start of Row sequence or the *END ROW* key to activate the End of Row sequence. The keys turn green and remain green until the sequence ends. The keys turn white once the sequence ends.

Touch the Settings key on the top right to access the Home settings screen. (see [Figure 17](#))

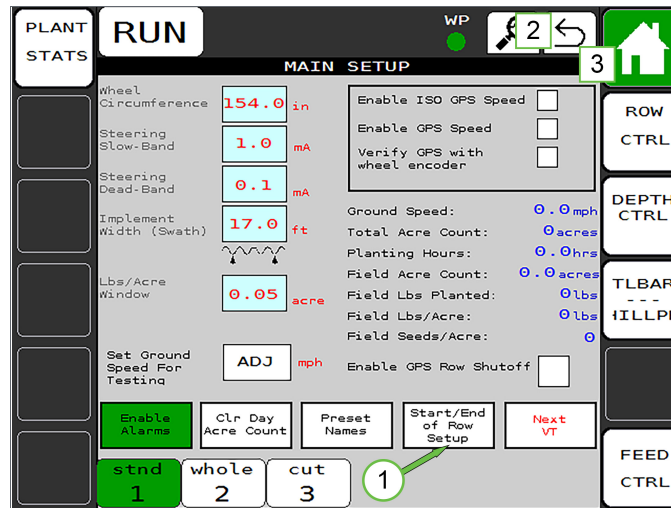


Figure 17

The Home settings screen for bed belt planters includes the (1) *Start/End of Row Setup* key. Touch the key to open the *Start/End of Row Setup* screen.

Touch the (2) Return key or (3) Home key to return to the Home screen.

3.2. Start and End of Row

On the *Start/End of Row Setup* screen, adjust settings in the (1) *Start of Row* and (2) *End of Row* sections to control the time required for individual start/end of row functions to start/stop at the start and end of rows. (see Figure 18)

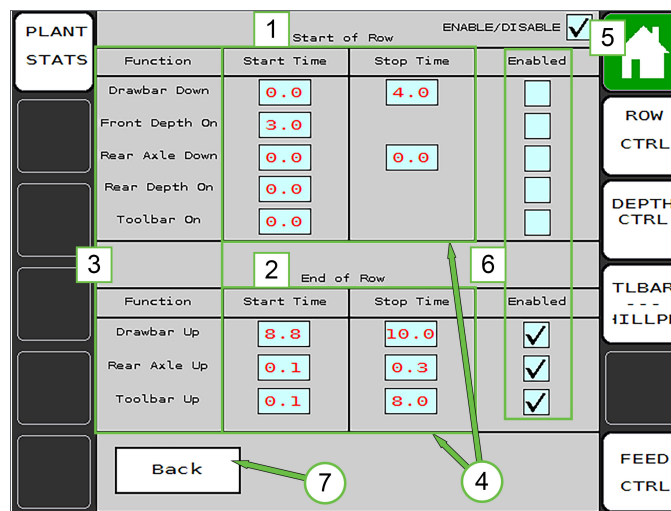


Figure 18

Individual functions related to *Start of Row* and *End of Row* are listed in the (3) *Function* sections of the display. Corresponding start/stop times are displayed in the (4) *Start Time* and *Stop Time* sections to the right of the listed functions. Start and stop times are displayed in seconds. For each function, these start and stop times are relative to time zero, which is when the *Start Row* or *End Row* key is touched. (see Figure 16)

Start/stop times are set at the factory, but may need to be adjusted in the field to maintain work position alignment. To adjust a setting, touch the desired value field. A keypad opens. Input the desired value and touch *OK* to save. Touch *ESC* to cancel without saving. If a stop time is set with a lesser value than the corresponding start time, the function is automatically disabled. For questions regarding these settings, contact your Spudnik Customer Service Representative.

Touch the (5) *ENABLE/DISABLE* box at the top right of the screen to enable/disable all of the *Start of Row* and *End of Row* functions. If this box is unchecked, the *Start of Row* and *End of Row* keys are hidden on all control screens.

Touch individual boxes in the (6) *Enabled* sections to enable/disable individual functions.

Touch the (7) *Back* key to return to the Home settings screen.

3.3. Row Control

The Row Control screen displays controls used for adjusting seed spacing and shaker speed. Grouped row sections, connected by (1) black connectors, indicate row units controlled by a single setpoint and/or physically connected to the same drive. The Row Control screen for bed belt planters also has a (2) *FEED CTRL* function key to access the Feed Control function screen. (see [Figure 19](#))

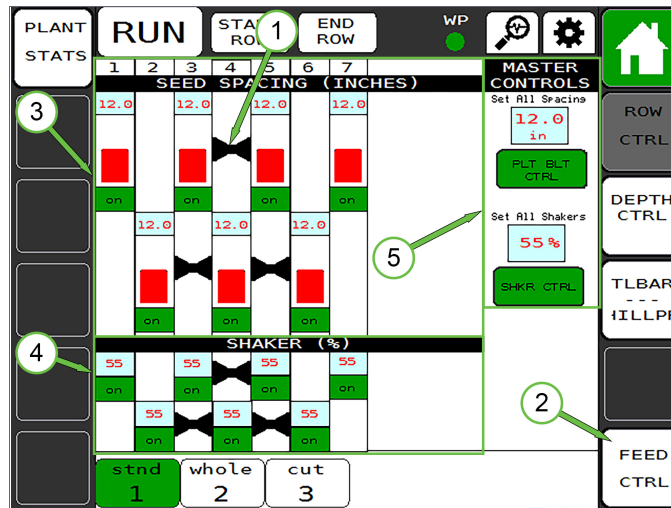


Figure 19

The (3) *SEED SPACING* graph displays seed spacing settings (red numbers and lines) and actual values (shown in blue). The (4) *SHAKER* display indicates the shaker speed as a percentage of the maximum setting. To adjust a setting, touch the desired value field in the (5) *MASTER CONTROLS* section. A keypad opens. Input the desired value and touch *OK* to save. Touch *ESC* to cancel without saving.

To adjust seed spacing in the *SEED SPACING* section and/or shaker percentage in the *SHAKER* section individually, touch the desired value field and input the desired value using the keypad. Note that adjusting the seed spacing or shaker value for any row unit in a grouped row section adjusts the value for every row unit in that grouped section.

Touch the key below each value field (i.e., *PLT BLT CTRL*, *SHKR CTRL*) to toggle the corresponding function on/off. The key is green when the function is active, and the *on* indicators turn green in the corresponding graph and status display sections on the left. To enter test mode, touch and hold a function key in the *MASTER CONTROLS* section, or any *on* key in the *SEED SPACING* or *SHAKER* sections, until the key turns blue. A beep sounds and test mode activates. The function runs in test mode until the key is touched again. Note that test mode only functions if ground speed is zero.

In Weight Control mode, (1) *SEED SPACING* settings for individual row units, as well as the master control (2) *Set All Spacing* setting, are calibrated automatically and cannot be adjusted manually. (see [Figure 20](#))

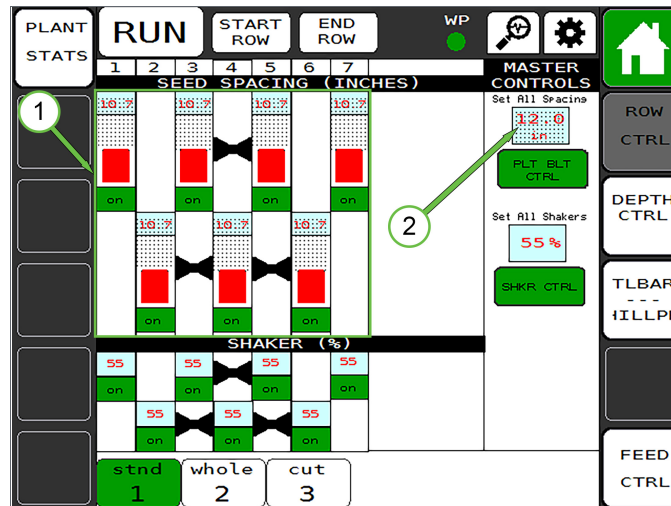


Figure 20

Touch the Settings key on the top right to access the Row Control settings screen. (see Figure 21)

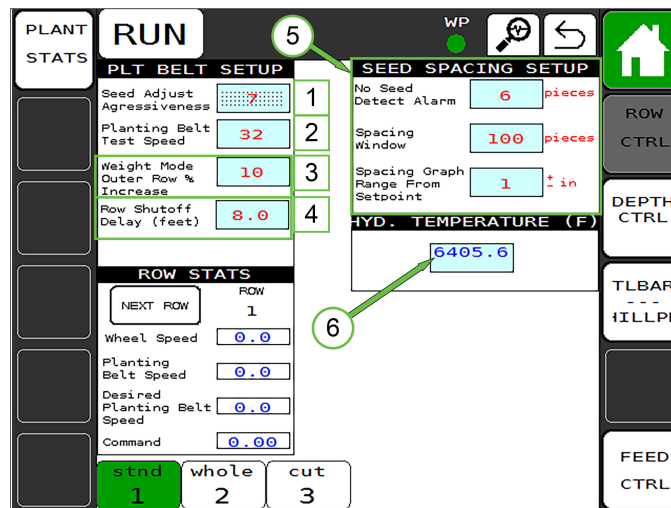


Figure 21

There are four settings which are adjusted in the *PLT BELT SETUP* section: (1) *Speed Adjust Aggressiveness*, (2) *Planting Belt Test Speed*, (3) *Weight Mode Outer Row % Increase*, and (4) *Row Shutoff Delay (feet)*.

See [Row Control](#) in the [Standard Controls](#) section for a description of the first two settings.

Use *Weight Mode Outer Row % Increase* to adjust the relative additional amount of seed planted in the outer rows compared to the amount of seed planted in other rows.

Use *Row Shutoff Delay (feet)* to adjust the distance in feet which the bed belt planter will travel after the front row section shuts off (i.e., stops planting) before the rear row section shuts off. The Row Shutoff Delay function is triggered when the bed belt planter is raised out of working position, or by GPS Row Shutoff, if it is enabled. This function ensures that planting continues to the end of a row.

See [Row Control](#) in the [Standard Controls](#) section for a description of the (5) *SEED SPACING SETUP* section.

The (6) Hydraulic Temperature for the bed belt planter self hydraulics is displayed in the *HYD. TEMPERATURE* section. The self hydraulics cooling fan turns on at 90 degrees and fan speed increases as the temperature increases.

3.4. Feed Control

The Feed Control screen for bed belt planters displays the (1) *FEED BOWL HEIGHT* graph, and the *FEED CTRL* and *FILL FEEDBOWLS* keys under the (2) *MASTER CONTROLS* section. (see [Figure 22](#))

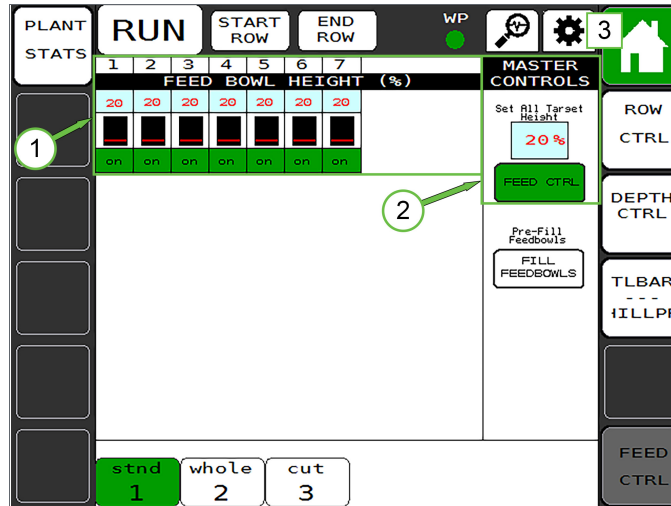


Figure 22

The *FEED BOWL HEIGHT* graph indicates the level of seed (setting and actual) in the feed bowl for each row unit (1-7) as a percentage of the feed bowl capacity. To adjust the setting for all feed bowls, touch the *Set All Target Height* field in the *MASTER CONTROLS* section. A keypad opens. Input the desired value and touch *OK* to save. Touch *ESC* to cancel without saving.

To adjust the setting for individual feed bowls, touch the desired field in the *FEED BOWL HEIGHT* graph.

To enable/disable the Feed Control function, touch the *FEED CTRL* key. The key is green when the function is enabled.

Use the *FILL FEEDBOWLS* key to pre-fill feedbowls to the preset level (the percentage indicated by the red numbers in the *FEED BOWL HEIGHT* graph). Touch the key to pre-fill the feedbowls. The key turns green and remains green while the feedbowls are filling. The key turns white once the feedbowls fill to the preset level.

To enter test mode, touch and hold the function key in the *MASTER CONTROLS* section, or any *on* key in the *FEED BOWL HEIGHT* section until the key turns blue. A beep sounds and test mode activates. The function runs in test mode until the key is touched again. Note that test mode only functions if ground speed is zero.

Touch the (3) Settings key to access the Feed Control settings screen. (see [Figure 23](#))

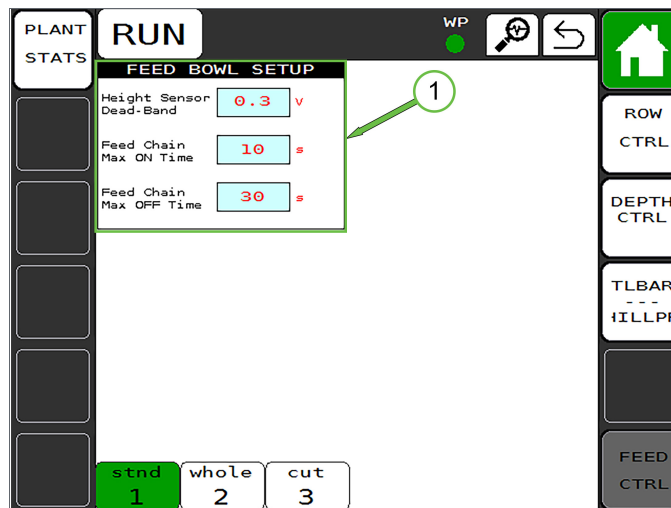


Figure 23

See the [Row Control](#) section under [Standard Controls](#) for a description of the settings in the (1) *FEED BOWL SETUP* section.

3.5. Depth Control

The Depth Control function screen displays setpoints and actual distances for left and right row units. Numbers, lines, and bars indicate distance from the ultrasonic depth sensors to the ground. Front and rear row units are adjusted independently. (see Figure 24)

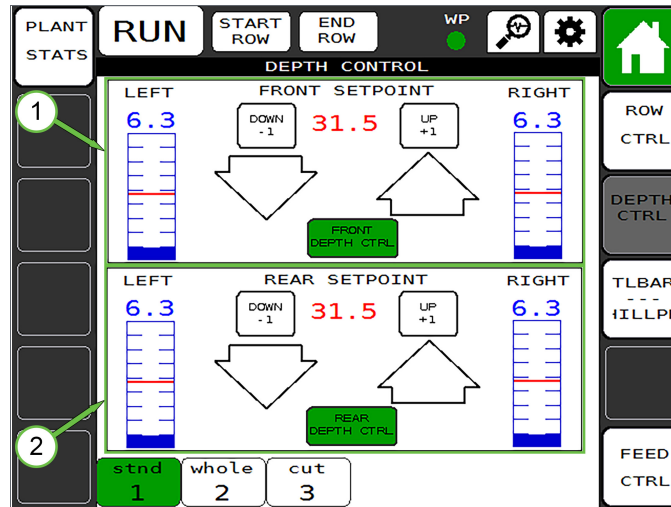


Figure 24

The red lines and red number in the (1) *FRONT SETPOINT* and (2) *REAR SETPOINT* sections indicate the setpoint (displayed as inches). The blue bars and blue numbers indicate actual values. Touch and hold the up or down arrows to adjust the cylinder stroke and update cylinder position. Touch the *DOWN -1* key or *UP +1* key to adjust the setpoint incrementally. To enter a specific value, touch the red setpoint number and input the desired value using the keypad that opens.

Touch the Settings key on the top right to access the Depth Control settings screen. (see Figure 25)

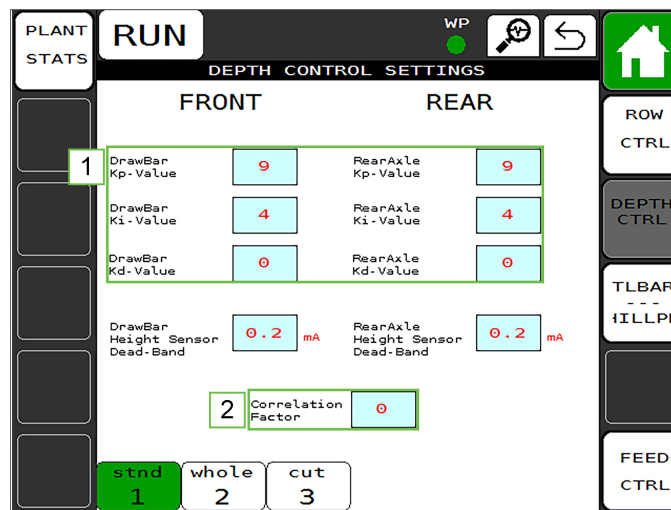


Figure 25

The (1) *FRONT* and *REAR* PID values are used for tuning the Depth Control function for the front and rear of the bed belt planter independently. These values are set at the factory. For questions regarding these values, contact your Spudnik Customer Service Representative.

The (2) *Correlation Factor* is an experimental feature, and should not be adjusted.

3.6. Toolbar and Hill Pro

The Toolbar and Hill Pro function and settings screens for standard belt planters and bed belt planters are essentially identical. See [Toolbar and Hill Pro](#) under the [Standard Controls](#) section of this Quick Reference.

3.7. Planting Stats

The Planting Stats screen for standard belt planters and bed belt planters are essentially identical. See [Planting Stats](#) under the [Standard Controls](#) section of this Quick Reference.

For additional Spudnik belt planter documentation, scan a QR code.

8904⁵⁴ Belt Planter



8906⁵⁴ Belt Planter



8908⁵⁴ Belt Planter



8946⁵⁴ Bed Belt Planter



8947⁵⁴ Bed Belt Planter



584 West 100 North
P.O. Box 1045
Blackfoot, ID 83221
+1 (208) 785-0480
spudnik@spudnik.com
www.spudnik.com