EXCEL Agriculture

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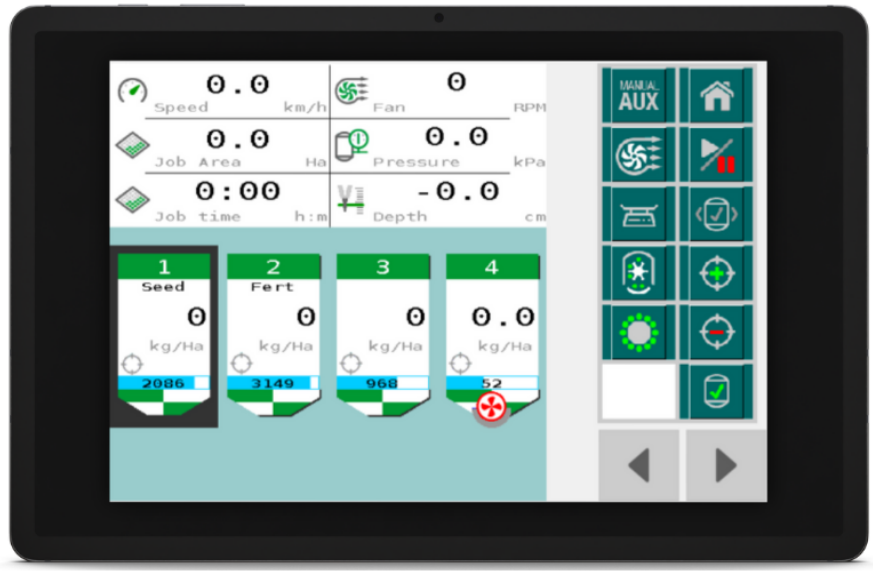
SmartAGSystems

ISO SEEDER CONTROLLER



Operator's Manual

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Toowoomba City QLD 4350.

This guide is to be printed and kept with the ISO seeder controller to ensure optimal setup and use for your machinery and safety.

PLEASE NOTE: Parts and specifications are subject to change. Part numbers may differ if supplied directly from OEM or retrofit.

February 2025

ISO Seeder Operations Manual

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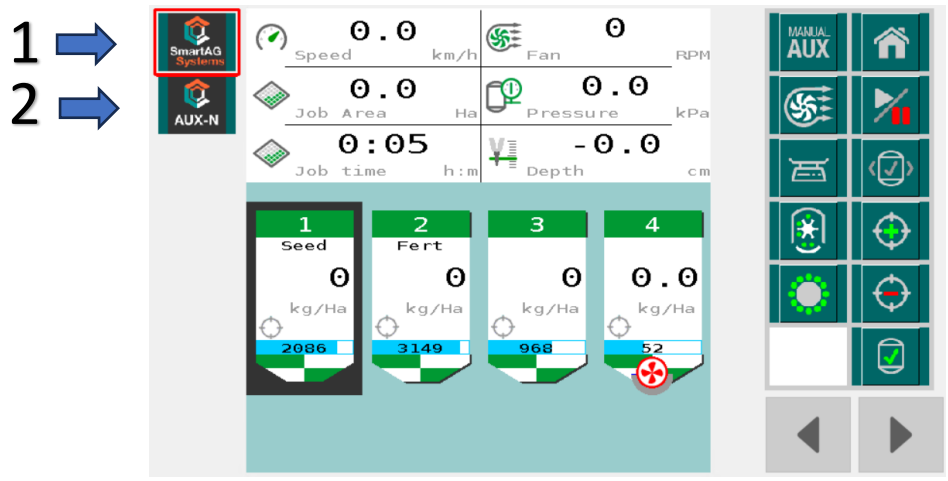
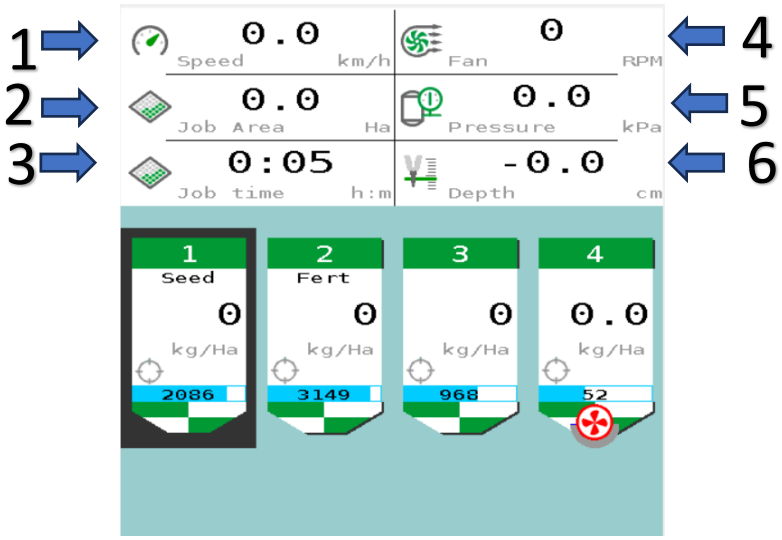
This manual is a guide for the operation of the Smart AG Systems ISOBUS Controller on a seeder.



When the screen view populates on your tractor screen you have two options:

1) This selects the main seeder operations screen. Once initially selected, this screen will in future come up automatically when the system is restarted.
2) AUX-N allows you to configure arm rest and Joystick buttons to operate the ISO screen.

Main Operations Screen

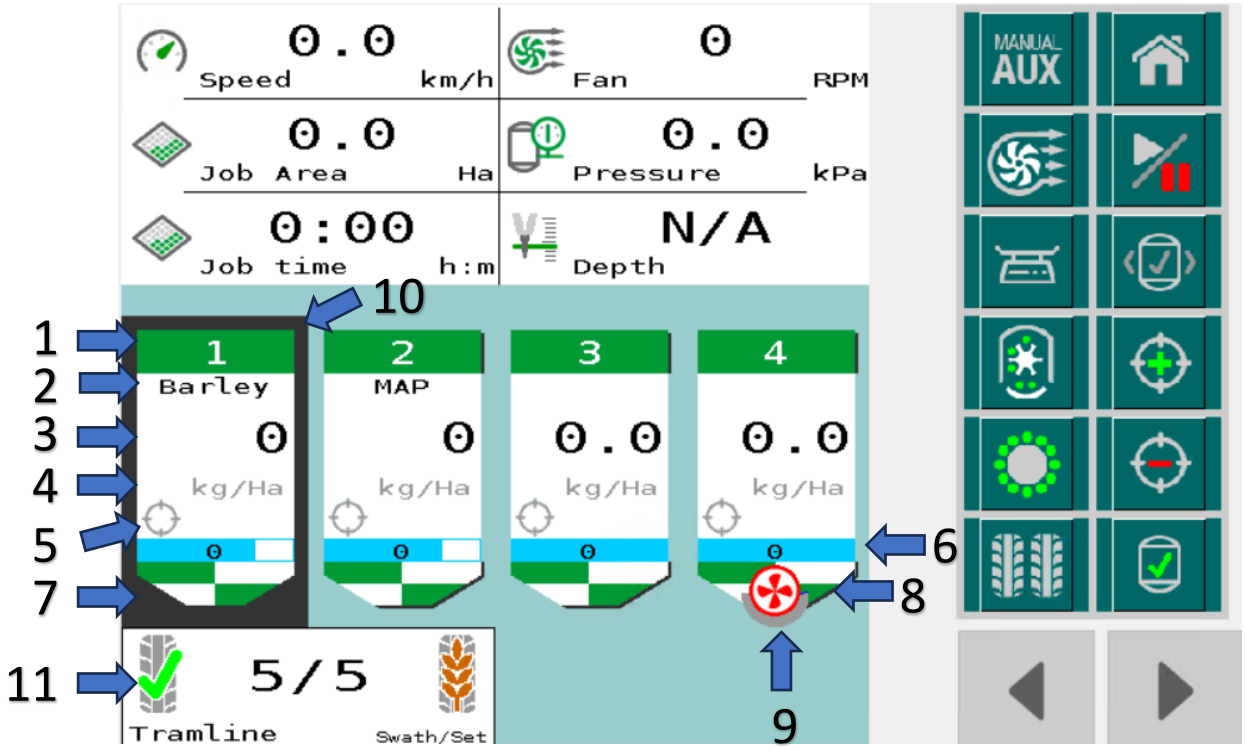


(1) Ground speed
(2) Job Area
(3) Job Time
(4) Fan Speed
(5) Fan Pressure
(6) Depth

If the Prime mode has been set the Speed tile can display alongside the speed reading the following:

1) **P** indicates prime mode
2) **S** indicates the system is in Slow Hold mode

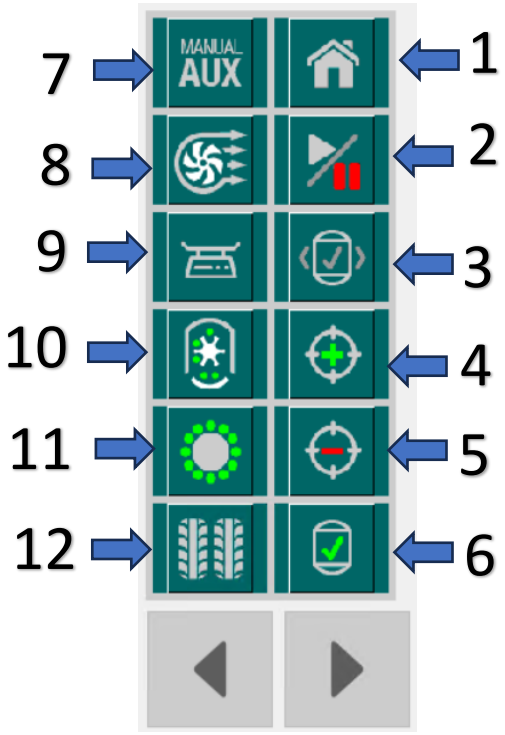
3) **H** indicates that the system is in Hold (until minimum speed is achieved)



1) Bin Number
2) Product allocated to bin.
3) Actual Rate (Live or Target)
4) S I Rate Units. (Kg/Ha or L/Ha)
5) Target Indicator. (Indicates if the rate is above, below or with 10% of target rate)
6) Bin Weight - blue bar graph showing the current percentage of bin capacity.
7) Icon to show if bin is in Run or Hold mode.
8) Fan Indicator to show if fan is switched On or Off.
9) Indicator to show percentage of Fan output.
10) Black Outline Indicates which bin is selected.
11) Current Tramline operation indicator and bout number

Soft Keys

Please note these keys can be on either side of the display and larger or smaller numbers depending on Brand and Model of ISO screen.

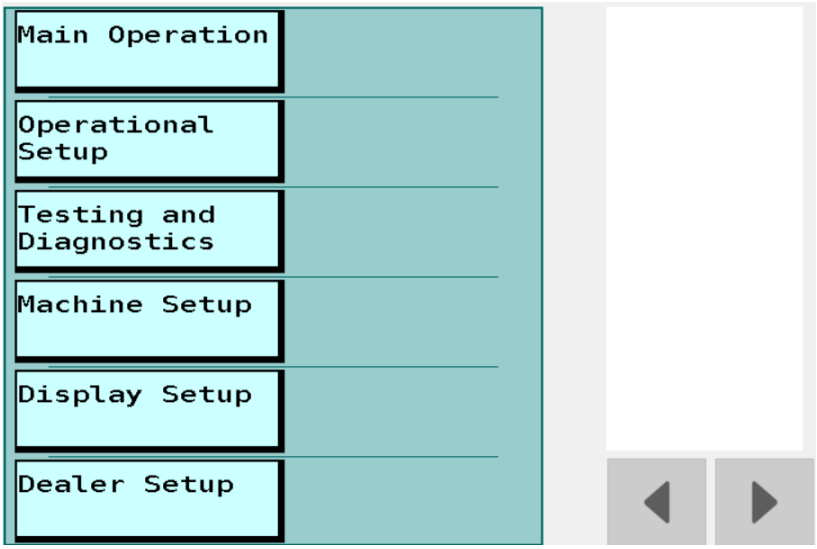


1) Home, Setup Pages, Operational Setup, Machine Setup, Testing and Diagnostics.
2) Run/ Hold button.
3) Bin Selection button (Toggles the black box across the bin to the selected bin).
4) Rate Increase button.
5) Rate Decrease Button.
6) Bin Control Button (Isolates bins if not used).
7) Manual Aux Button (Manual switches for Lights and Hydraulics).
8) Fan Control Button (allows fans to be switched on and off and change speed).
9) Calibration Button using load cells (if fitted) to calibrate machine.
10) Quick Calibrate Button. Shortcut to calibration page.
11) Blockage sensors (if fitted) Information Button.
12) Tramline (if fitted) adjustment Button

System Setup

Press the **Home** Softkey for all setup and system configurations.

1) **Main Operation** returns to the main operating screen.
2) **Operational Setup** for all bin/product related configurations.
3) **Testing and Diagnostics** for all motor testing and diagnostic information.
4) **Machine Setup** Alarms, Prime Time, Task Controller and File Server.
5) **Display Setup** This allows the software to be moved to another Universal Terminal
6) **Dealer Setup** this is only available to the commissioning dealers



Operational Setup

Press the Home button from the front screen and select **Operational Setup.**

This area is where all day-to-day setup is done, product details and all bin associated management is controlled.

Jobs, this is where front screen Job information is kept and managed.

Product Management Addition, removal, setup and information about products.

Bin # Operations Bin Levels, Application Rates, Application Step size, VRA Nudge Step size. Individual **Bin Operations** tiles will be displayed for all bins setup on the system.

Bin Product Product Selection, Manual Calibration input, Product Calibration, Advanced Calibration setup and Calibration units.

Tramlines, enabling and setting of the tramline configuration.

Depth Sensor, Enabling and setting of depth sensor.

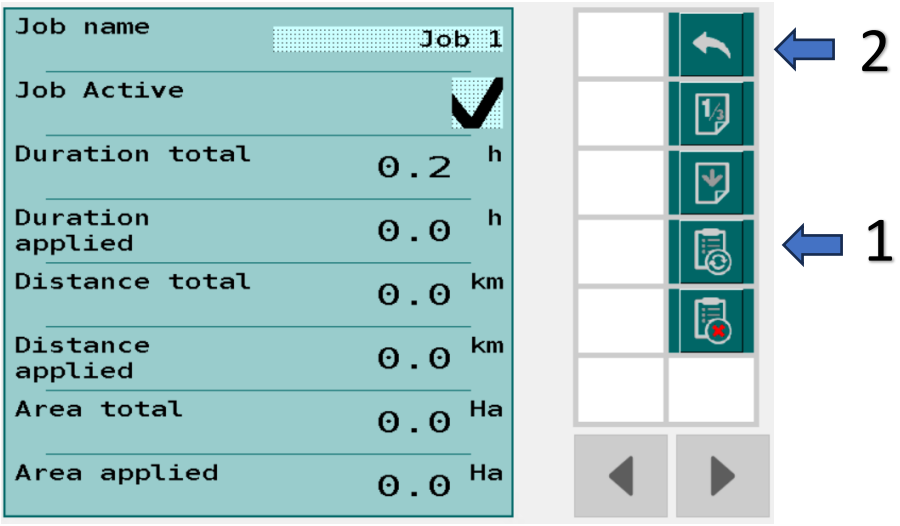
TECU Hitch Position, Enable access to the tractor three point linkage sensor for seeder control.

TECU Working State, when enabled will switch the implement into and out of Run Mode.

Jobs

From the Operational Setup screen, press the **Jobs** tile. As there is only one job available, Press the **Job 1** tile to enter the Jobs information and management screen.

NOTE – only 1 job us available on the UT/VT screen. Further Job records can only be accessed through the Task Control screen (if available)

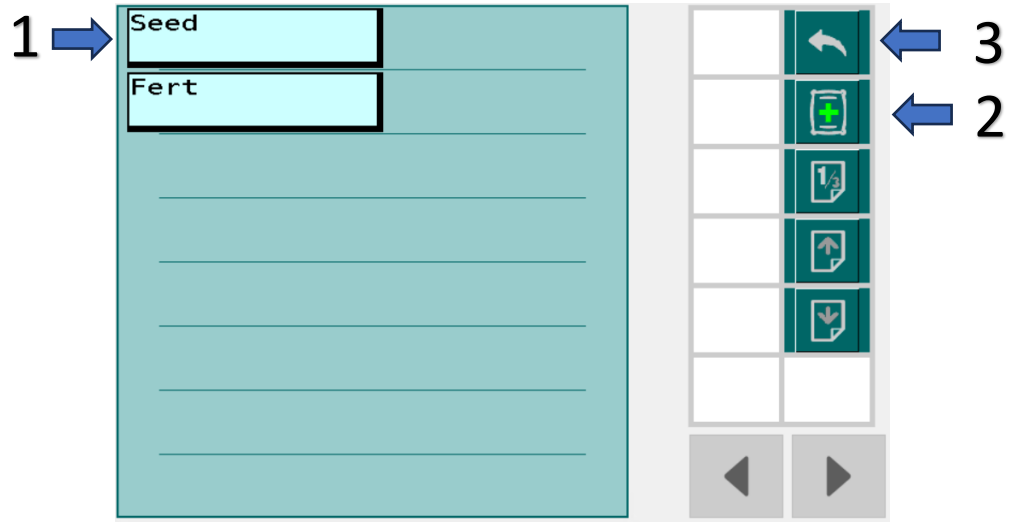


1) This button will reset all the Job 1 data and clear the Main operations screen job information.
2) Press the **Return** button twice to return to the Operational Setup page.

Product Management

This area where set up of new and removal of product is completed.

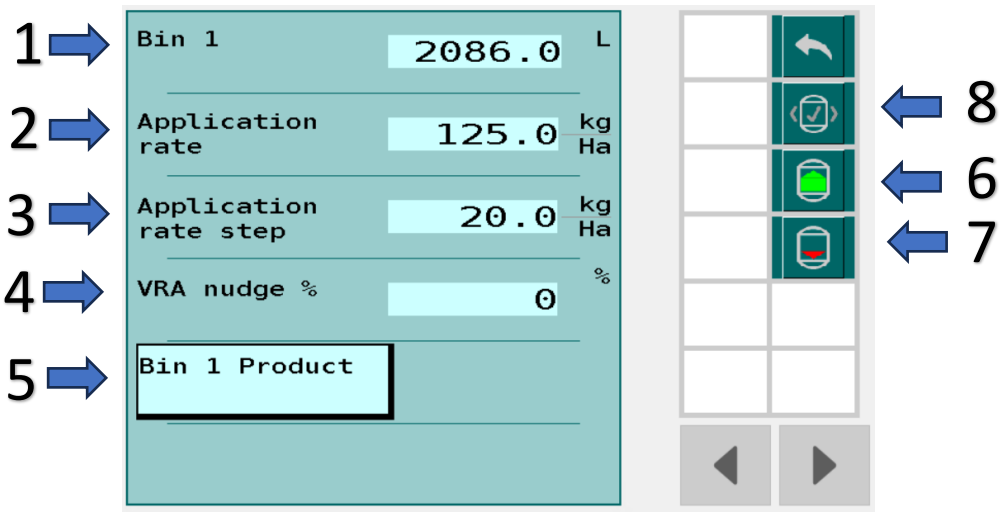
From the Operational Setup screen, press the **Product Management** tile.



1) Pressing any of these tiles will display the name and the product information. This area will allow naming of the product, selection of liquid or granular and addition of bulk density.
2) Adds a new product.
3) Press the **Return** button to return to the Operational Setup page.

Bin # Operations

From the Operational Setup screen, press the **Bin # Operations** tile for the bin number you require.



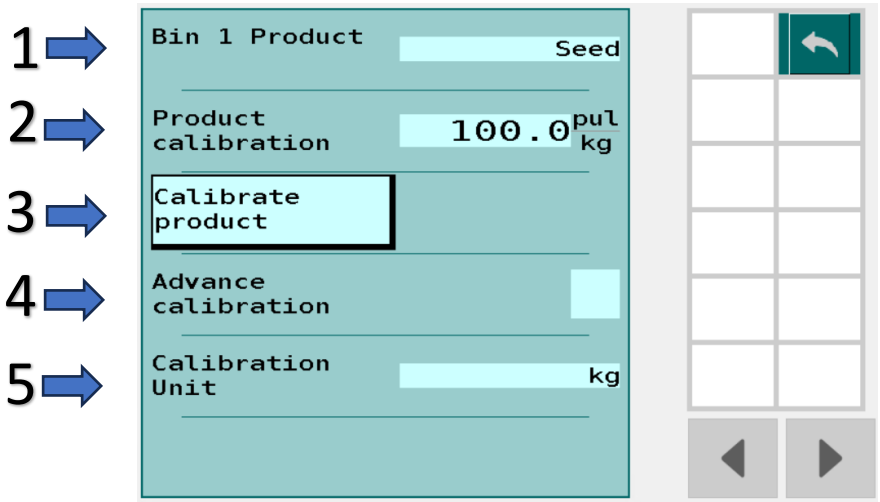
This area allows settings for:

1) Current bin weight (not available when using load cells as it is automatically calculated)
2) Default Application rate
3) Application rate step size
4) VRA rate step size (if used)
5) Select to **Calibrate** the product for this bin.
6) Quick Fill Button
7) Quick Empty Button
8) Toggle to next Bin button

Please note When using the Quick Fill Button (6), that the full bin weight will not be added to the bin tally if the bin and product have not be configured correctly first.

Calibration Setup

From the Bin # Operations screen, press the **Bin Product** tile**.**



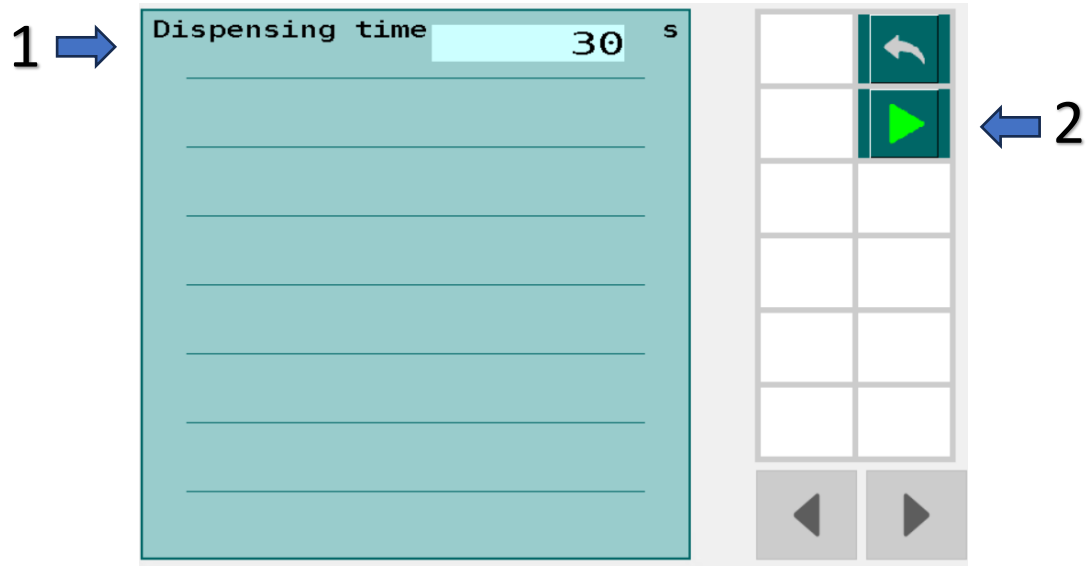
1) Bin product Press the **Product** to get the selection from the preset products - setup in Product Management).
2) Product Calibration Press the **Value** to enter a known calibration value and set manually)
3) Product Calibration Press **Calibrate Product** tile to start the calibration)

4) Advance Calibration. (Tick the box to access the advanced calibration) (See Advance Calibration section)
5) Calibration Unit (Press the SI units to get the unit measurement required) (Kg, g)

Basic Calibration

From the bin Product screen, press **Calibrate Product** tile.

This screen is set up with a default of 30 seconds, this can be changed to suit your requirements and once the Play button is pressed the calibration process will commence.



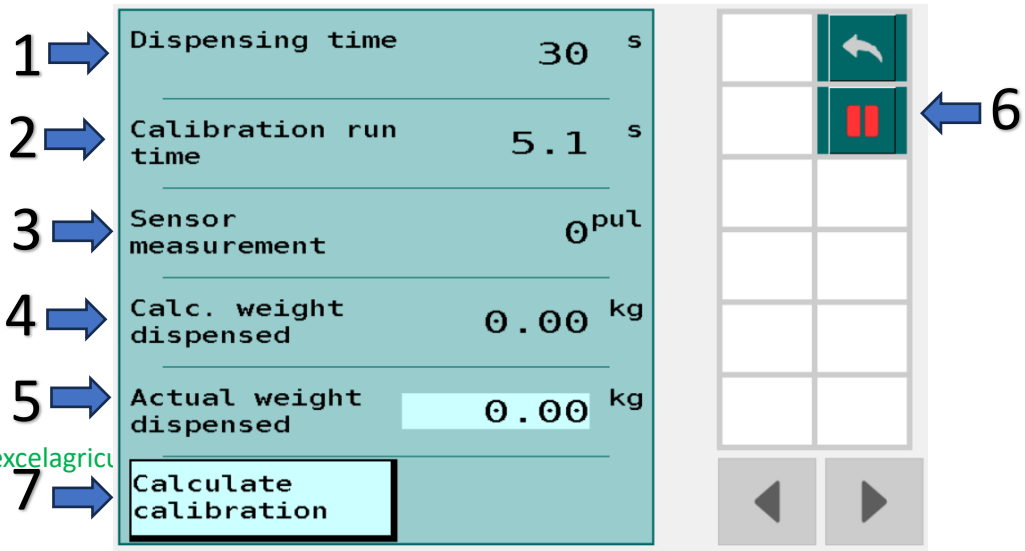
1) Dispensing Time
2) Start Calibration Button

To Start the calibration, Press the **Play** Button (2) and the live calibration page will be displayed.

The system will run for the target time and then stop. To stop the calibration process, press the **Pause** button. (This will not affect the calibration)

Once the calibration is complete, measure the weight of the product dispensed and press the **Actual Weight Dispensed** and add the measured value.

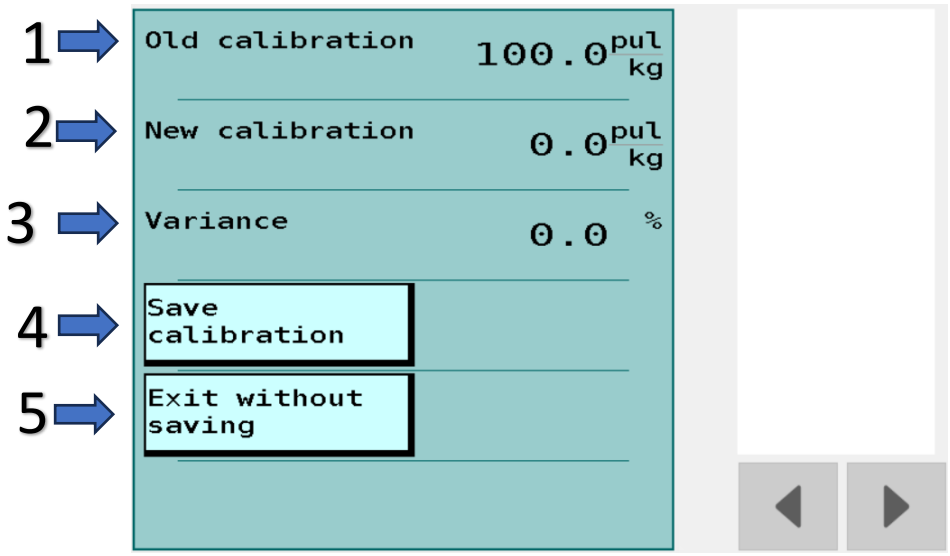
Then press the Calculate Calibration Button.



1) Dispensing Time (Will show the target time for Calibration)
2) Calibration Run Time (Shows the actual time that the calibration has run for)
3) Sensor Measurement (The amount of pulses received during the calibration)
4) Calc Weight Dispensed (The theoretical weight that should have been dispensed)
5) Actual Weight Dispensed (Press this and add the actual weight that was measured)
6) Pause Calibration button (This button is used to pause calibration e.g. if the container is about to overflow)
7) Calculate Calibration Button

Once the Calculate Calibration button has been pressed the calibration values will be displayed along with the variance between the two calibration values.

If the calibration value looks valid, press the **Save Calibration** button and this will update the calibration value automatically**.** If the new calibration value appears incorrect, press the **Exit without Saving** Button. You will be asked to confirm that you wish to Exit without Saving. Your option is now to either redo the calibration or continue with the old calibration value.

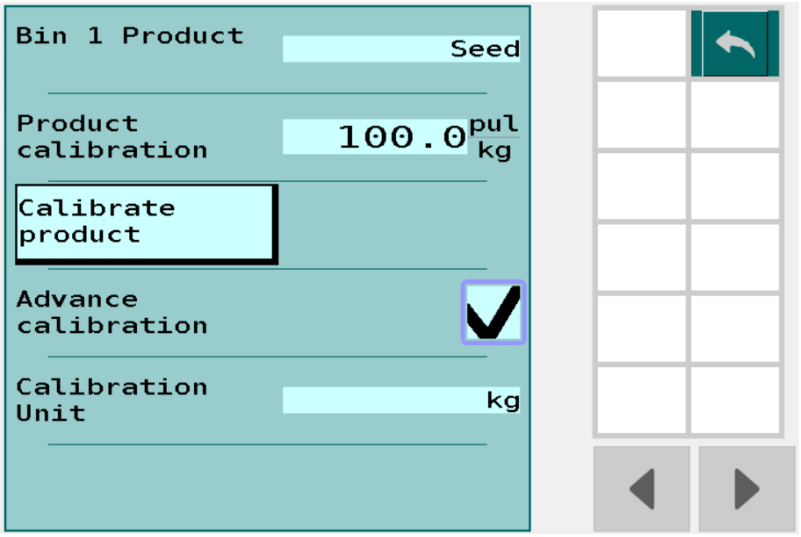


Advanced Calibration

The feature allows you to perform other options for calibration by either:

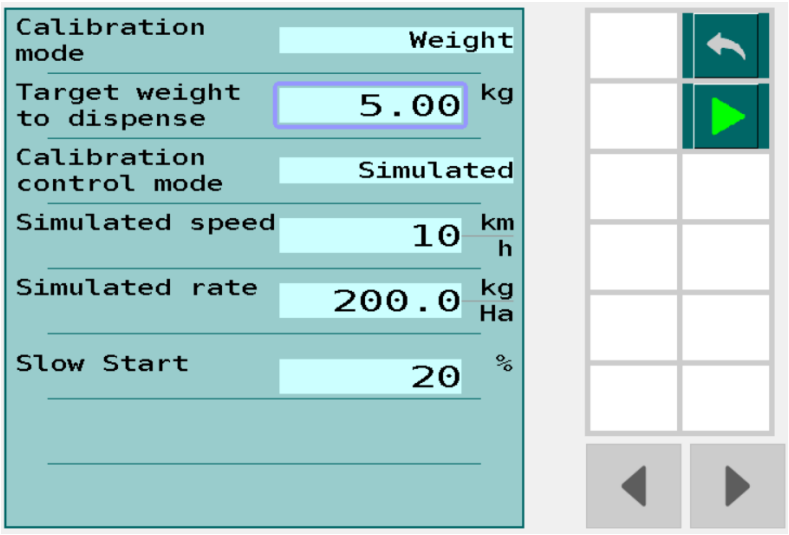
1) Selecting a % of maximum feed roll speed
2) Simulating the ground speed and feed roll speed of normal planting conditions

From the Bin # Operations screen, press the **Bin Product** tile**.**



Press the **Advance Calibration** box to add the tick

Then Press the **Calibrate product** Button.



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Calibration Mode (Weight or Time)

Target Weight to Dispense (Target weight to dispense or Dispensing Time)

Calibration Control Mode (Simulated or Fixed Output)

Simulated Speed (Set to actual planting speed)

Simulated Rate (Set to required planting rate)

Slow Start (Normally set to zero % for hydraulic applications. If large electric motors are being used this can be changed to slow start the motors

and reduce a large current draw on startup) (0% - 100% provides zero to 10 seconds ramp time.)

Then Press the **Calibrate product** Button to start the calibration.

Refer to Basic Calibration for information on the balance of the Calibration Procedure.

NOTE – If Quick Calibration button/s are setup on the front screen, calibration type will revert to the last calibration type used.

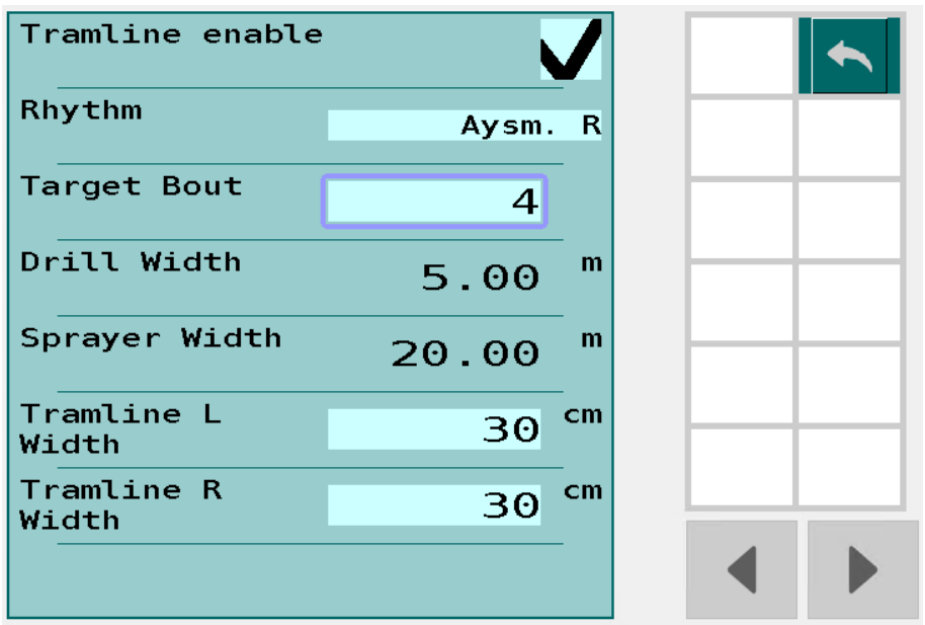
Tramline

This feature allows for a non-planted traffic lane in the field where vehicles can drive without destroying crops. This is achieved by shutting off the seed distribution tube, lifting a Tyne and cancelling the blockage alarm to a specific seed boot in the required sequence to form the traffic lanes in a heavy crop.

Depending on how your seeder is set up, you may have more than one applicator and this will be set by your commissioning dealer.

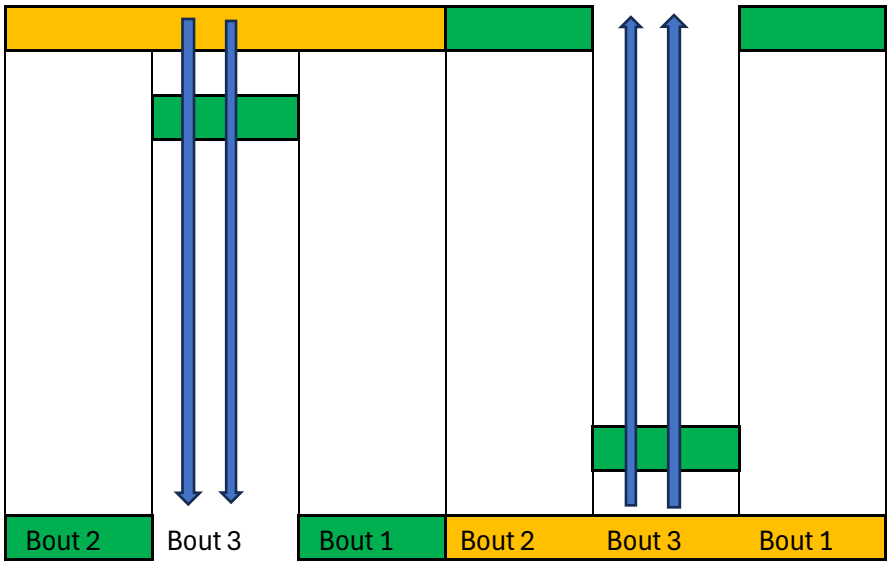
You will need to select the applicator for the corresponding bin/product that you wish to remove from your planting scenario when the tramlines are activated.

For example, you may have a pre-emergent spray ahead of the main planting tines/discs and this would be applicator one. This is followed by the seed and fertiliser being planted by the main tines/discs and this would be applicator 2. If you are spreading bait behind the seeder then this would be applicator 3. The reason for the different applicators is that they are applying at different positions and the field application mapping controlled to these positions



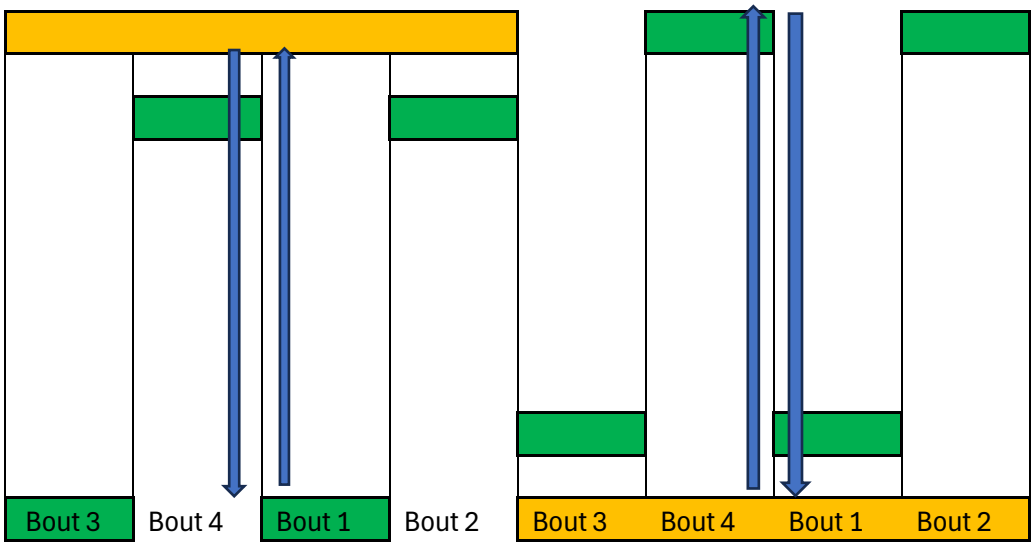
To set up this unit you will have to determine if you are using Symmetrical or Asymmetrical tramlining using the descriptions below. It is also necessary to know how many bouts of the drill are done per bout of the sprayer.

Symmetrical Tramlines: are used when the sprayer swath width is divided by drill width and it results in an odd number. E.g. 15m spray width / 5m drill width = three swaths. This is symmetrical tramlining as the Tramlines are generated down centre of the swath.



Tramlines are generated on the last bout for symmetrical control.

Asymmetrical Tramlines are used when the sprayer swath width is divided by drill swath width and it results in an even number of bouts, e.g. 20m spray width / 5m drill width = four swaths. This is Asymmetrical tramlining as tramlines as not generated in the same swath. In the diagram below tramlines are generated in adjoining swaths.



Tramlines are generated on the last and first bout for Asymmetrical control.

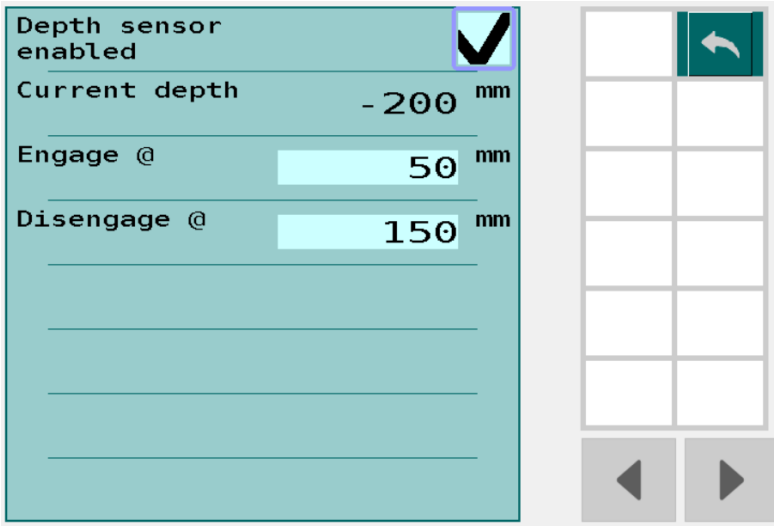
Please note that the position of the tramlining boot/tyne will be on either the left or right hand side of the drill and this will require the corresponding Left Asymmetrical or Right Asymmetrical to be selected for the correct positioning of the tramlines.

Tramline Soft key functions

- Returns to main operation page.
- Seeder Run Hold Button.
- Pauses the tramlining.
- Increases the bout number.
- Decreases the bout number.

Depth Sensor

This feature enables the depth sensor, which in turn will control the Run/Hold function of the seeder based on the implement depth. The sensor will display the current depth and it is possible to set engage and disengage depths at different points. Adjusting these depths allows the operator to tune seeding to start as the drill is lowered, ensuring that seed is at the seeding boot as it enters the ground. In turn, correct settings will stop seeding as the drill is raised reducing wasted seed.



TECU Hitch Position

This feature is the same as the depth sensor except that it uses the tractor 3-point linkage position sensor to determine the Engage and Disengage position for the seeder.

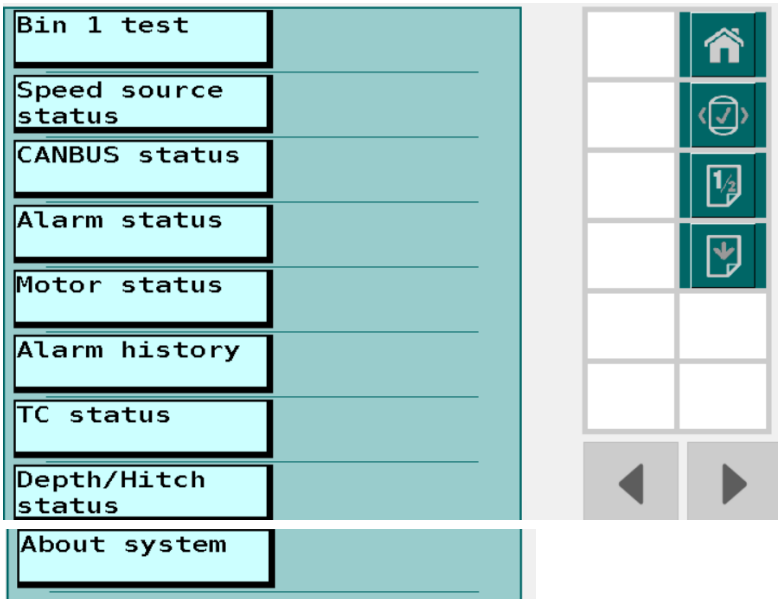
TECU Working State

When this feature is enabled a signal from the tractor will control the **run/hold** function of the seeder.

When finished press the **Return** Soft key then, press the **Home** Button to get back to the main setup page.

Testing and Diagnostics

Press the **Testing and Diagnostics** Button, this is the area where all diagnostics information is located.

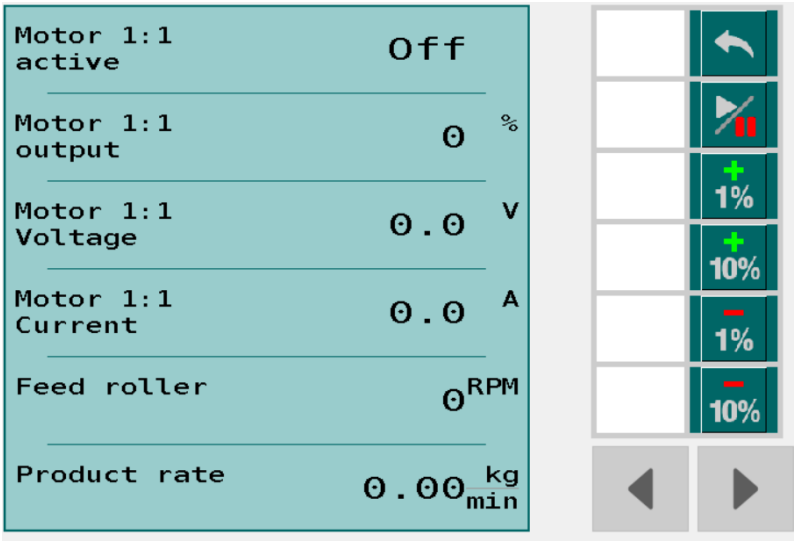


1) Bin # test - This allows confirmation that the motor output is working correctly.
2) Speed Source Status - Shows the raw data from the speed sensor.
3) CANBus Status - Shows which pods/load cell are connected. Pod and individual load cell voltage readings are displayed.
4) Alarm Status - shows all alarms available and status.
5) Motor Status - Shows live motor power outputs (% output, Voltage and Amps)
6) Alarm History - records the history of all alarms.
7) TC Status - Shows if the TC controller is available and connected
8) Depth/Hitch Status - shows enabled/disabled status, and run / hold status.

9) About System - Shows Software version, hardware ID, unlocks current on the POD and the ability to add an Unlock Code for extra features.

Bin Motor Test

The Bin # test allows direct output of power to the motor. This removes any control algorithm from the output and supplies the full range of output power to verify the motor output is working.



The soft keys allow the operator to set the power to test on the motor drive. Pressing Play will start the motor running. This enables the operator to check power being used by the motor and check feedback status of the feed roller encoder.

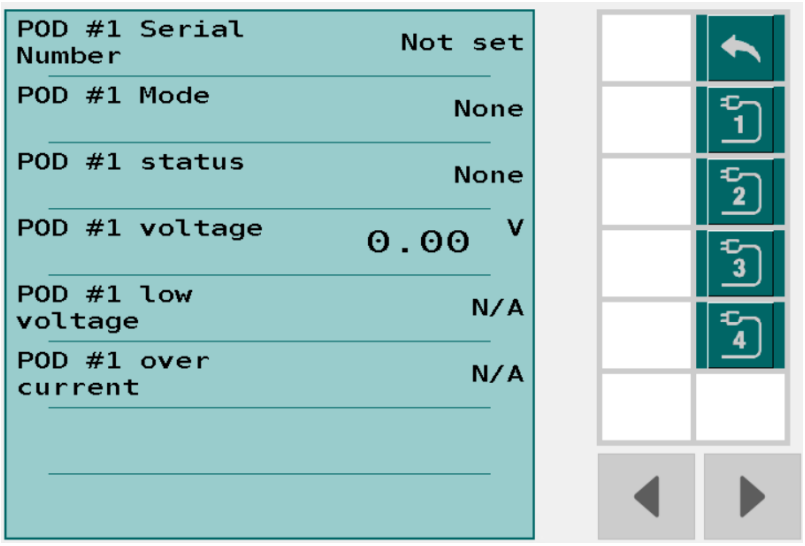
Speed Source Status

This page shows the type of speed source selected and any live data on the speed input.

CANBUS Status

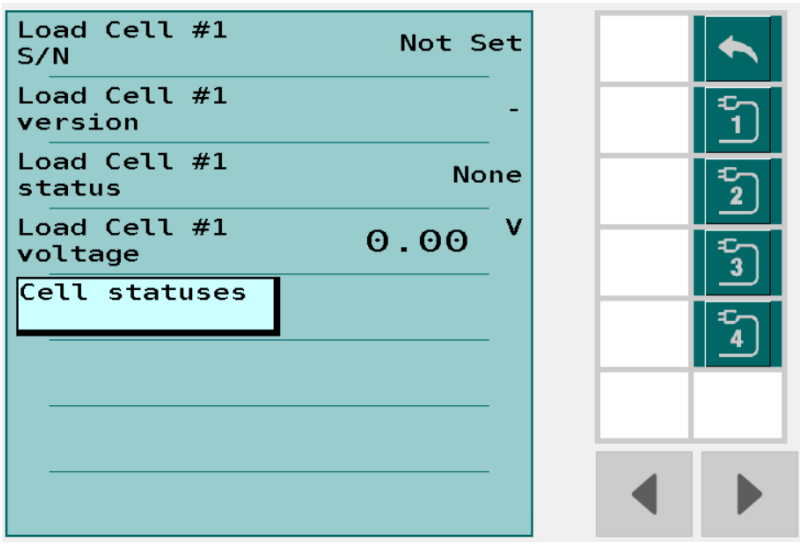
These pages show the following information for:

1) **Pods** – This displays the information to show the pod is connected correctly.



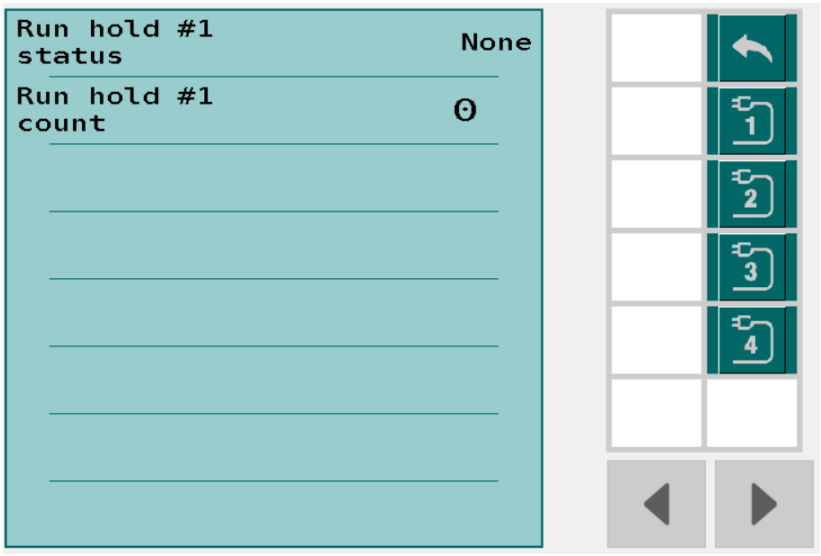
If more than one Pod is connected, the softkeys allow quick access to the other pods.

2) **Load cell** – This displays information to show the load cell is connected correctly and individual cell readings when, **Cell statuses** is pressed.

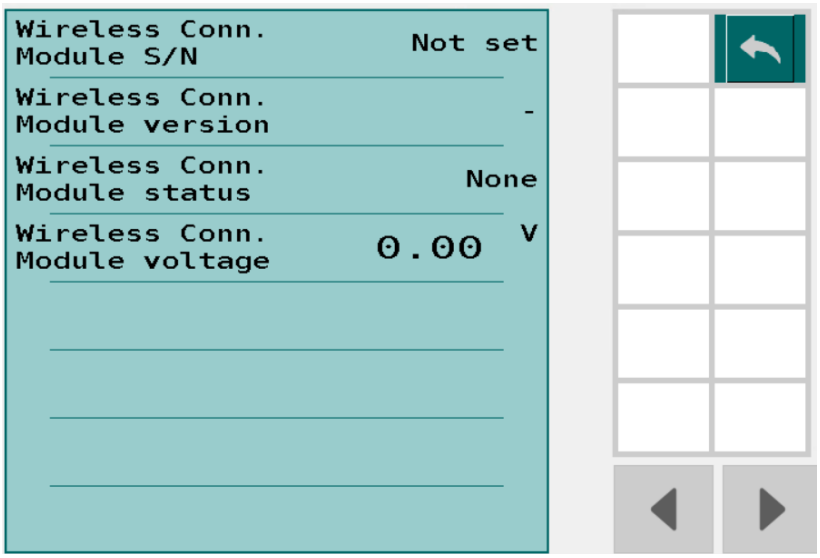


If more than one load cell is connected, the softkey allows quick access to the other load cell settings.

3) **Run/Hold Switches**. These pages allow the operator to see how many switches are connected and how many times they have been activated in the current session.



4) **Wireless Conn Module -** This displays information to if show the Wireless Control Module is connected correctly and current software version.



Alarm Status

These pages show all alarms setup and status - OK, Tripped or disabled.

Motor Status

This page is available when the machine is in run mode and allows the operator to see what the motor state is and to determine if the motor is running at its optimal speed range.

TC Status

This page shows if the Task Controller is availability and if connected.

Depth Hitch Status

This page displays the state of the following:

Depth Sensor - Implement depth sensor (analogue) **Enabled/Disabled**
Depth Sensor Run State – status (**on / off** based on the calibration set points)
TECU working state – status if **Enabled/Disabled**
TECU Working run state - the tractor is telling us it's in work (calibrated on the TECU)
TECU hitch position - Three point linkage sensor – ie hitch position being used off the TECU
TECU hitch run state – options of **Run/Hold/Not Available**

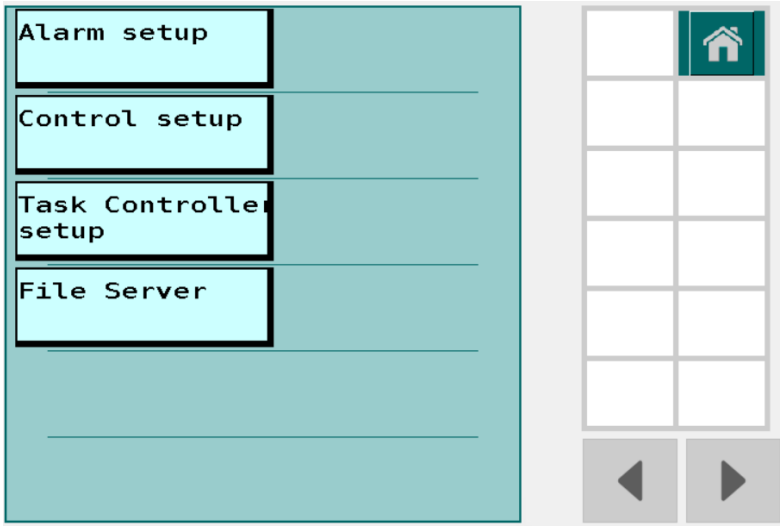
About System

This page shows the following information:

1) Software version
2) Build Version
3) Controller Model
4) Site ID
5) Hardware ID
6) View Software Unlock - This allows the operator to see which software features are enabled. Also enables the operator to enter new unlock codes to enable new features.

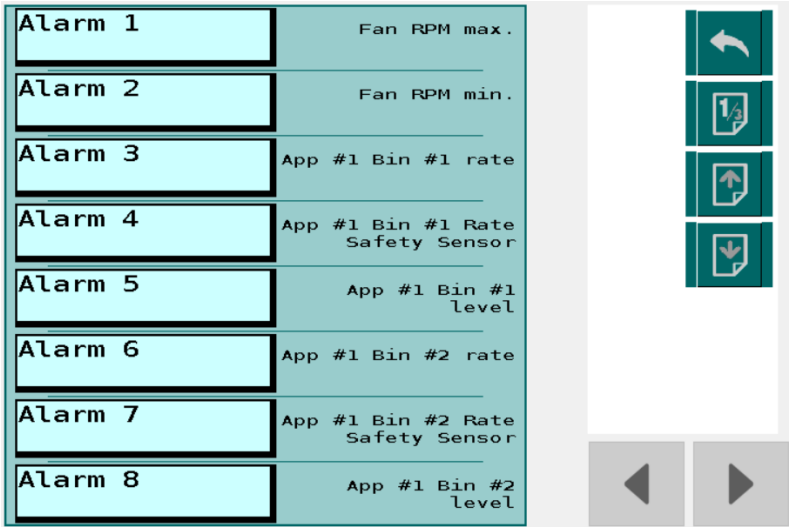
Machine Setup

Press **Machine setup** button for all the non bin related machine step

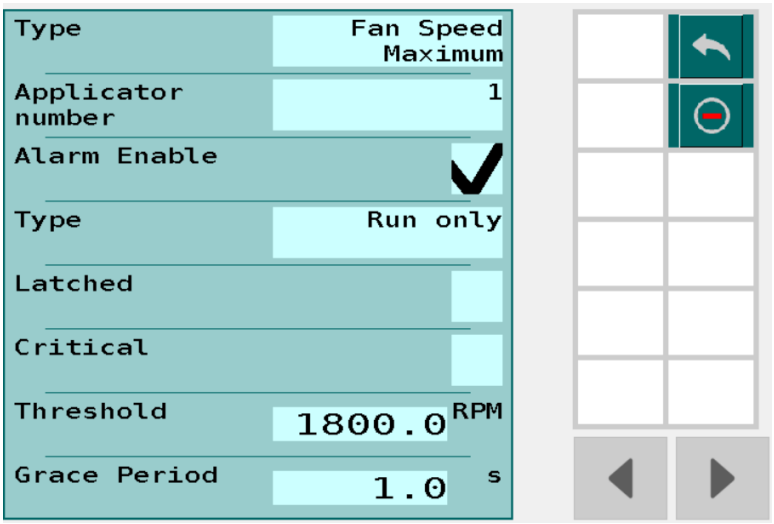


Alarm Setup

Alarms are automatically populated for the number of bin available. This area allows you to tailor the alarms to your settings.



Press any of the Alarm tiles and it will display the setup page where you can Add/Remove or modify the alarm settings.



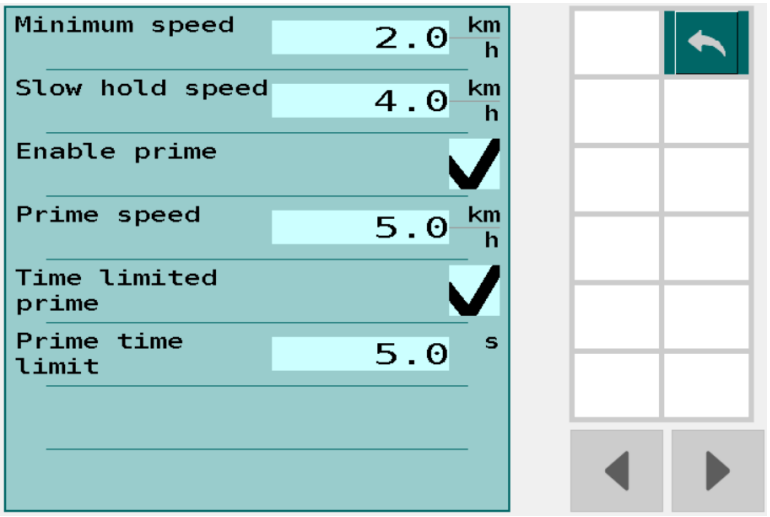
1) **Alarm Enable,** allows to you to enable and disable the alarm. (disabling alarms without deleting them is useful during fault finding)
2) **Latched,** if tripped the alarm will not automatically reset when the parameters return to normal.
3) **Critical,** if the alarm is tripped the system will go into hold mode and the system will need to be reset for it to work again.
4) **Threshold,** this is the setting you want the alarm to trip at.
5) **Grace Period,** the alarm will be delayed for this period of time, so that short periods beyond the threshold does not cause the alarm to go off.

Once you have configured your alarm tile, press the return key to get back to the main alarm page. In Most cases there will be more that one page of alarms so, use the **Up** or **Down** pages soft keys to scroll to the required alarm tile.

Use the Red minus or Green plus softkeys if you wish to remove or add any alarms completely.

Control Setup

This is where the speed related control is setup.

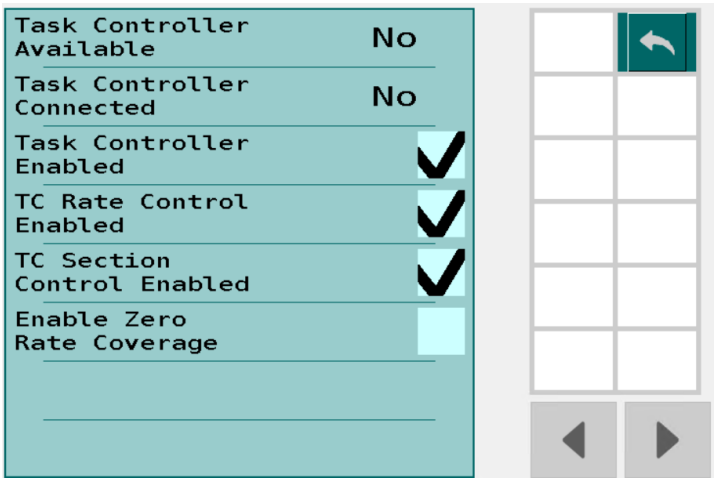


1) **Minimum speed,** the slowest operating speed for the machine. Below this speed the machine will go into **Hold** mode.
2) **Slow Hold speed,** this setting will maintain the speed you set, when you go below that speed until either you speed up above the slow hold speed or you slow down below the minimum speed where the unit will go into hold mode.
3) **Enable Prime,** enabling this allows the system to output a control signal when standing still.
4) **Prime Speed,** this is a simulated speed, that the system will run at, when the **Run** button is pressed. Assumes that Enable Prime (above) has been selected.
5) **Time Limited**, enabling this allows the system to run in prime mode for a designated time, if not ticked then and prime mode selected this will override the actual speed signal. This can be used as a speed source if a speed sensor has failed.
6) **Prime Time Limit,** this is time the system will run for when the **Run** button is pressed.

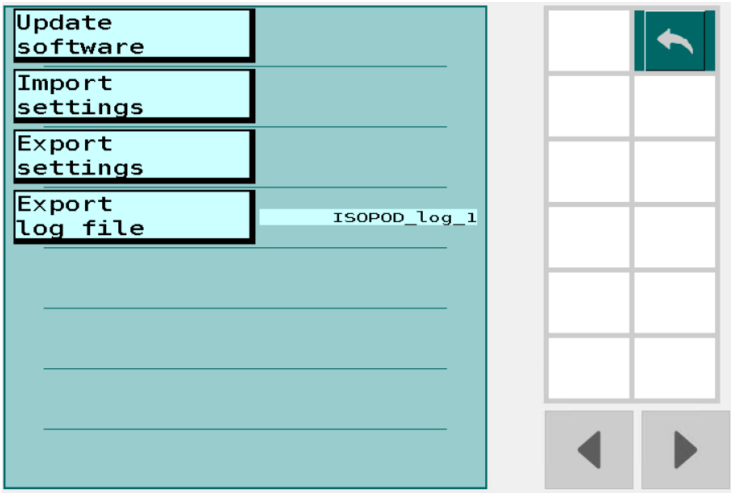
If both the Prime Speed and the Prime time are enabled, when any of these two parameters are exceeded, normal control will be resumed.

Task Controller Setup

This is where the operator can see if the Task Controller is available and select functions that have unlocked.



File Server (where the tractor screen is file server capable)



This is where you can:

1) **Update software**, by inserting USB stick (containing latest Software) into tractor screen and pressing Update Software will start the updating process.
2) **Import Settings**, if you have saved your setting to a USB stick, you can import them to reset the machine.
3) **Export Settings**, once you have setup the machine it is possible to save the settings, by exporting them to a USB stick. This is a valuable backup enabling the operator to reimport the original saved settings and regain operating status.
4) **Export Log File,** This is used to export files for diagnostic purposes.

Display Setup

This area is used If you have two ISO capable screen in your Tractor/self-propelled machine and you want to move seeder operations screen to the other display.

Dealer Setup

This area is for use by the commissioning dealer only and is password protected.

Notes