e-Spreader Controller User Manual

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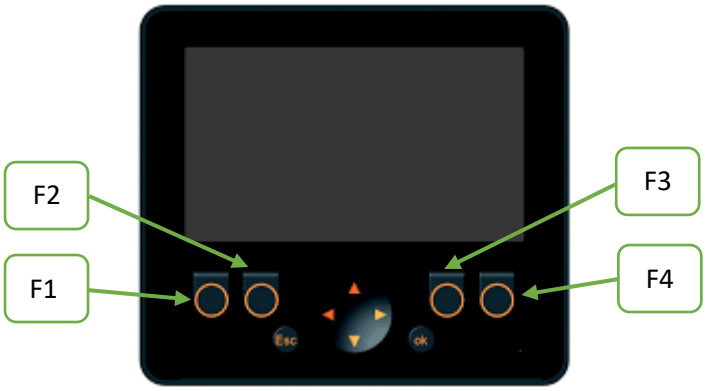
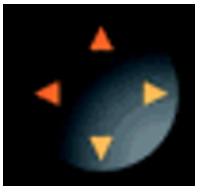
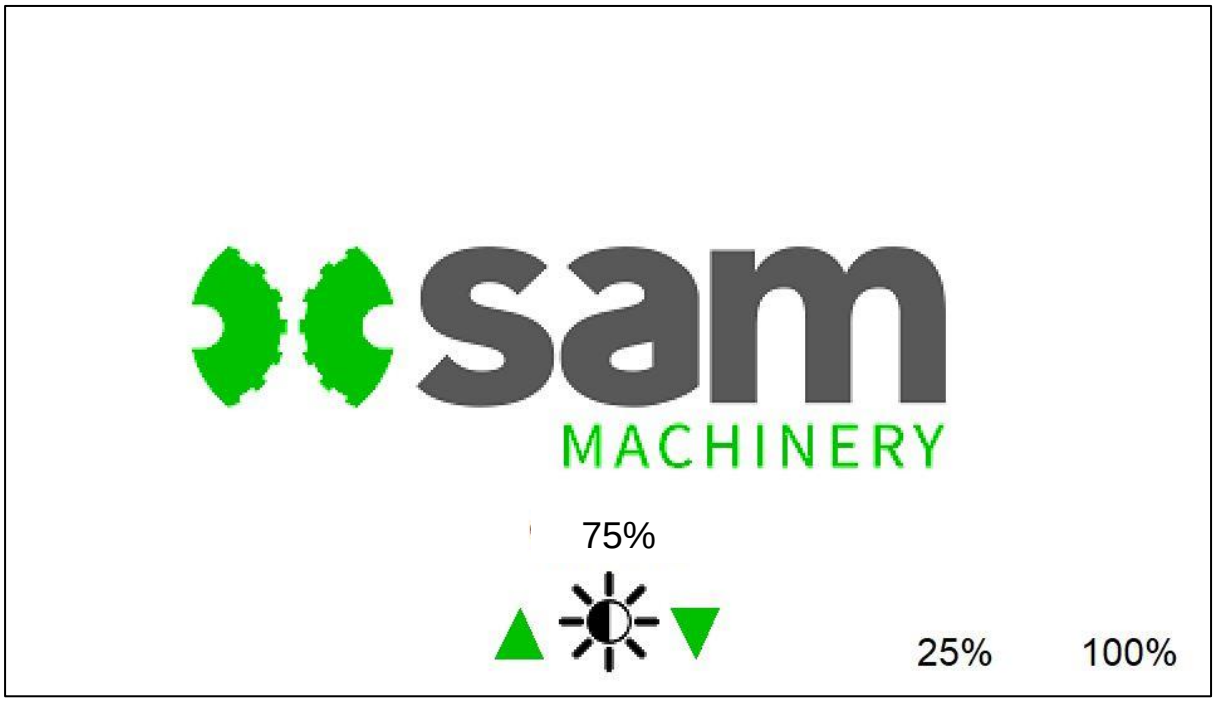
Screen navigation controls



	Function Keys F1 – F4	Used to navigate screen and turn functions on and off
	Arrow Keys	Used to adjust settings and move the cursor between settings
	Escape	Used to change screens
	OK	Used to change screens and accept changes

Splash screen



Use the up/down arrow keys to adjust the brightness

Press 25% to quickly change to night-time brightness

Press 100% to quickly change to daytime brightness

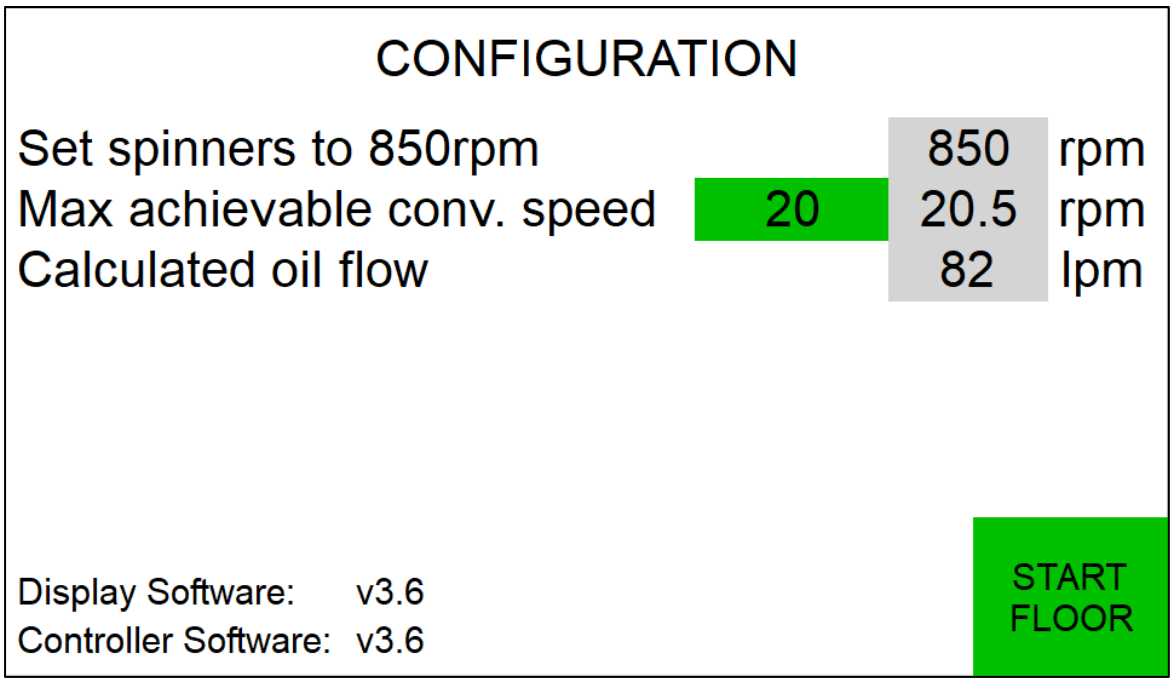
Press Esc to go the main operation screen, or wait 5 seconds and it will change automatically.

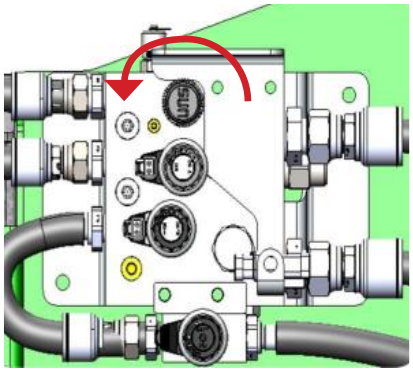
Press and hold OK for 5 seconds to go to the configuration screen.

Configuration

This configuration screen is used to set up the spreader with your tractor for the first time. Configuration needs to be performed before the spreader is loaded with product.

Set the configuration settings with the engine at operating rpm, the hydraulics engaged and delivering 70-90lpm.



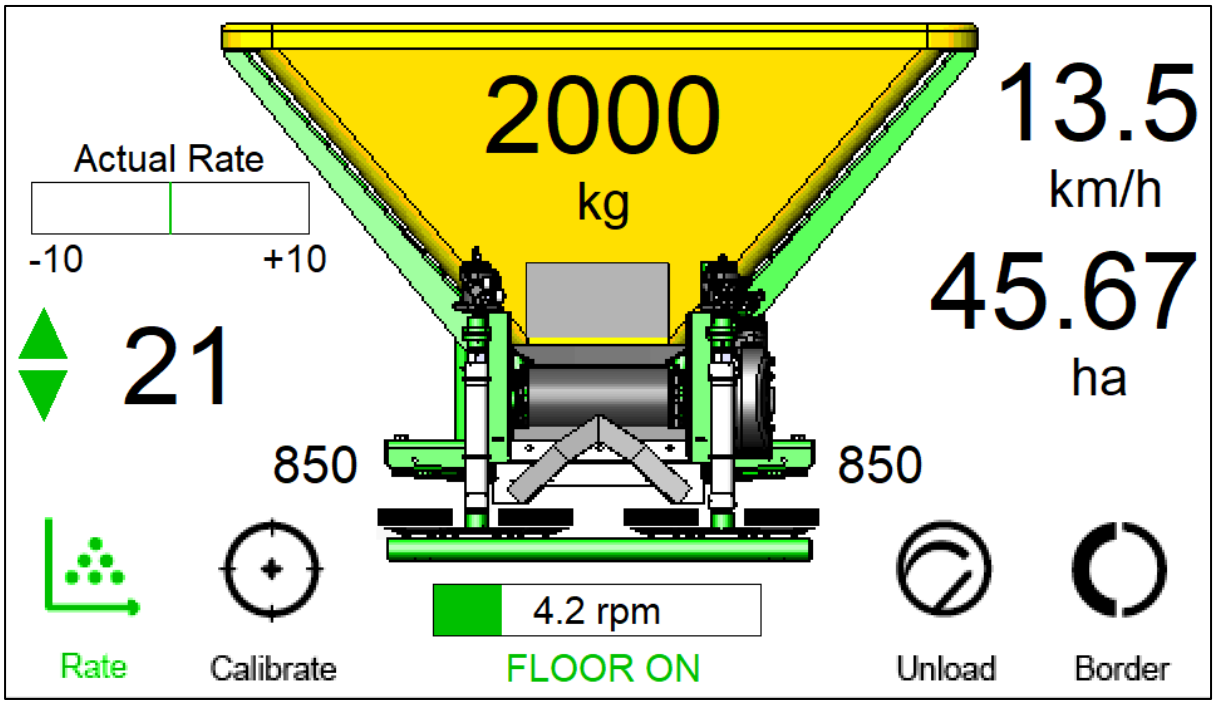
Set spinners to 850rpm	The spreaders spinners are adjustable from the valve block at the back of the machine. See the drawing below. Wind the knob on the valve block anti-clockwise until the spinner speed in the grey box is at 850rpm. Then tighten the lock ring. 
Max achievable conv. speed	The grey box shows the actual rpm of the conveyor When the floor is running, read the actual rpm of the floor Use the up/down arrows to set the “Max achievable conv. speed” to just above this. 20rpm is typical setting if the tractor is delivering >70lpm.

Calculated oil flow	The theoretical oil usage is displayed based on the hydraulic motor cc and motor rpm. This is a guide only of what the spreader is using, and not what the tractor is providing. Use a flow meter to measure the actual tractor flow.
Start Floor	Press the F4 key to start the floor running. Start floor will turn green and run the floor at full speed. The floor switch needs to be on for this to work.

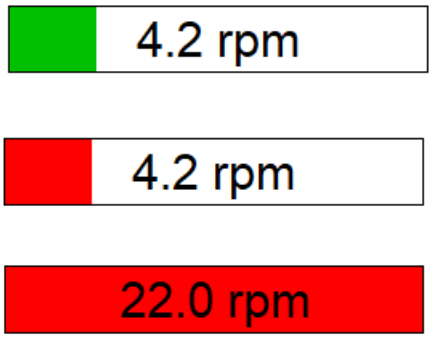
Setting the maximum achievable conveyor rpm will determine the maximum speed the operator can travel while spreading.

Press ESC to go back to the splash screen.

Main operation screen

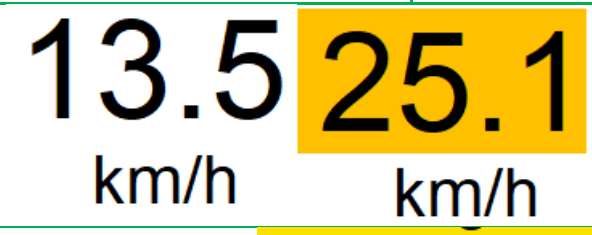


Rate Rate	Press the F1 key to enable and disable the rate control. This needs to be turned on for the spreader to work. Press and hold the F1 key to go to the rate settings screen
Calibrate	Press the F2 key to go the calibration screen.
Unload Unload	Press the F3 key to enable the unload function. This will turn off the rate control mode (if it is already enabled) and run the conveyor at full speed if the floor switch is turned on. Turn the spinners speed down using the needle valve on the hydraulic valve block before enabling the unload function.
Border Border	Press the F4 key to enable and disable the border control
FLOOR ON FLOOR OFF	This shows the status of the floor switch. The floor switch needs to be ON for the floor to move. Use the floor switch to turn the floor on and off when moving in and out of headlands or around obstacles.

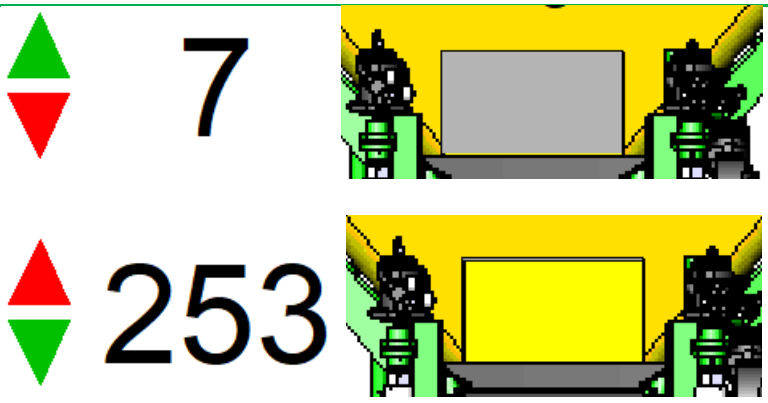


Floor conveyor speed display
The green bar shows the floor speed scale between 0 and the max achievable speed.

If the speed bar turns red and is not at the maximum, then this means the floor conveyor is not achieving the speed required to meet the rate.
See troubleshooting
If the bar turns full red, this means the conveyor is running at max rpm. Slow down so that the mat can achieve the required spread rate.

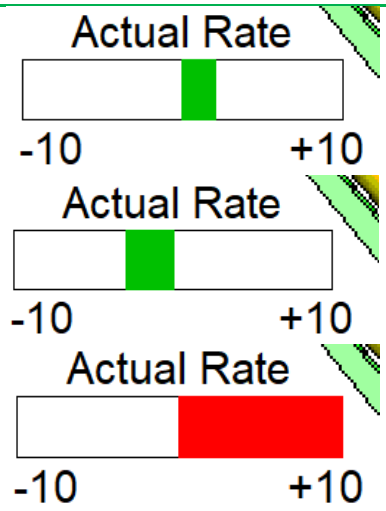


Speed display
If the speedo turns orange, this means that you are travelling too fast for the conveyor max achievable speed



Electric Door
Press the up/down arrows to change position of the door.
The floor conveyor will change speed to achieve the set rate.
Red down arrow = lowest position
Red up arrow = highest position

Manual door
Press the up/down arrows to set the door height to what the door is set at.



Shows the actual current rate on a scale of -10% to +10% of the required rate.

When changing speeds or turning corners, this will go up and down.

Red = off scale

	Displays the current spinner RPM. Adjust the speed of the spinners on the needle valve on the hydraulic manifold.

Quick start – get spreading

Engage hydraulics and set engine RPM to increase hydraulic flow to 70-90lpm. As per how it was setup during configuration.

Enable the spreader by pressing the rate button above. The icon will turn green, and the spreader will be ready to start working.

Turn the mat switch ON, then when you are travelling faster than the minimum speed, the belt will start. When you travel into headlands you can quickly stop and start the spreader using the mat switch. If your speed drops below the minimum speed, the spreader will stop.

Make sure to drive as close to the tractor centres as possible.

Monitor the rate bar. This will tell you if the spreader is achieving the rate required. The smoother and straighter you drive the more stable and accurate the spreader will be.

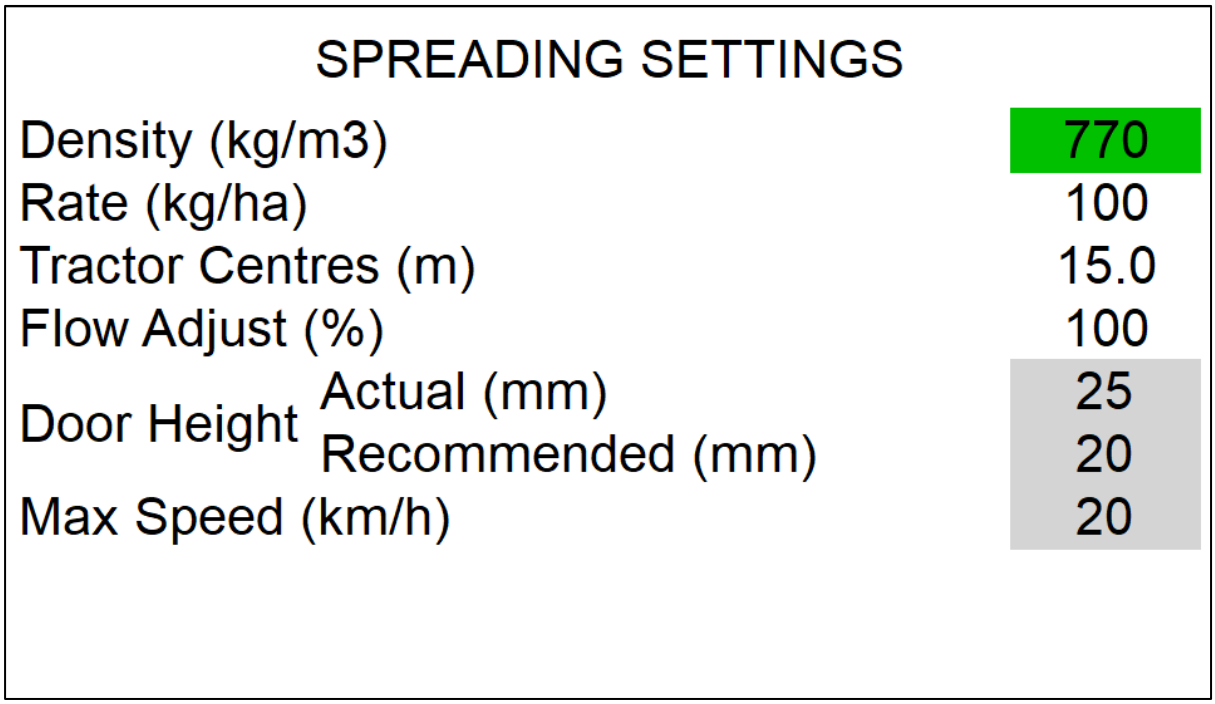
Monitor the floor bar. This will increase from 0rpm when you first start spreading to a steady rpm. If it is jumping around a lot or turning red, see the troubleshooting section.

Monitor the speedo. If it is turning orange, see the troubleshooting section.

To manually set the flow adjust, take a reading of the hectare counter and the weight, then spread as normal for an area that is convenient. Take a reading of the area you have covered and the product you have used. If you are spreading too light or too heavy, work out the percentage difference and adjust the flow factor accordingly.

DO NOT adjust the door height as this will not change the rate the spreader is trying to achieve.

Rate control

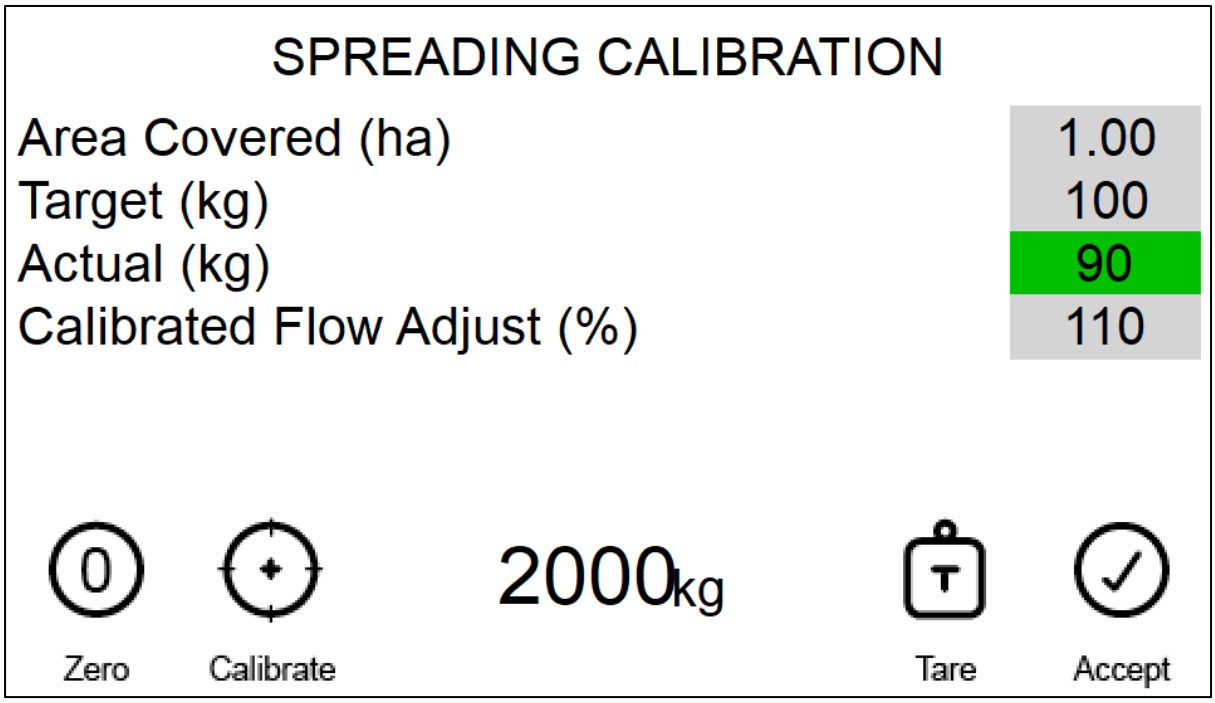


Use the up/down arrows to select the setting

Use the left/right arrows to adjust the setting

Density	Enter the density of the product in kg/m3
Rate	Enter the required spread rate in kg/ha
Tractor Centres	Enter the tractor centres in metres
Flow Adjust	Use the flow adjust to fine tune the actual rate that the spreader is achieving 100% is the base setting. The computer will run the floor at the theoretical speed to achieve the rate based on the current door height and speed Increase this as a % if the actual rate is too light Decrease this as a % if the actual rate is too heavy
Door Height Actual	Electric door – Displays the current door position Manual door – Enter the actual position of the door
Door Height Recommended	Displays the recommended door height to run the floor at ideal speeds. Based on the required rate and ideal aim ratio
Max Speed	Theoretical max speed that you can travel before the floor cannot run any faster. Based on the max achievable floor speed in the configuration settings

Manual calibration



Zero	Press F1 to reset the area covered and target weight
Calibrate	Press F2 to go to the weight calibration screen
Tare	Press F3 to Tare the scales. The Tare is reset on power cycle. If the scales need to be re-zeroed, go to the load cell screen.
Accept	Press F4 to accept the new calibrated flow adjust
Area Covered	If the floor conveyor is moving, this hectare counter will increment.
Target	As the hectare counter increments, this is the theoretical amount of product that should have been spread.
Actual	Use the left/right keys to adjust how much product has actually been used over the area covered.
Calibrated flow adjust	Calculates how much the flow adjust needs to be adjusted to achieve the required rate.

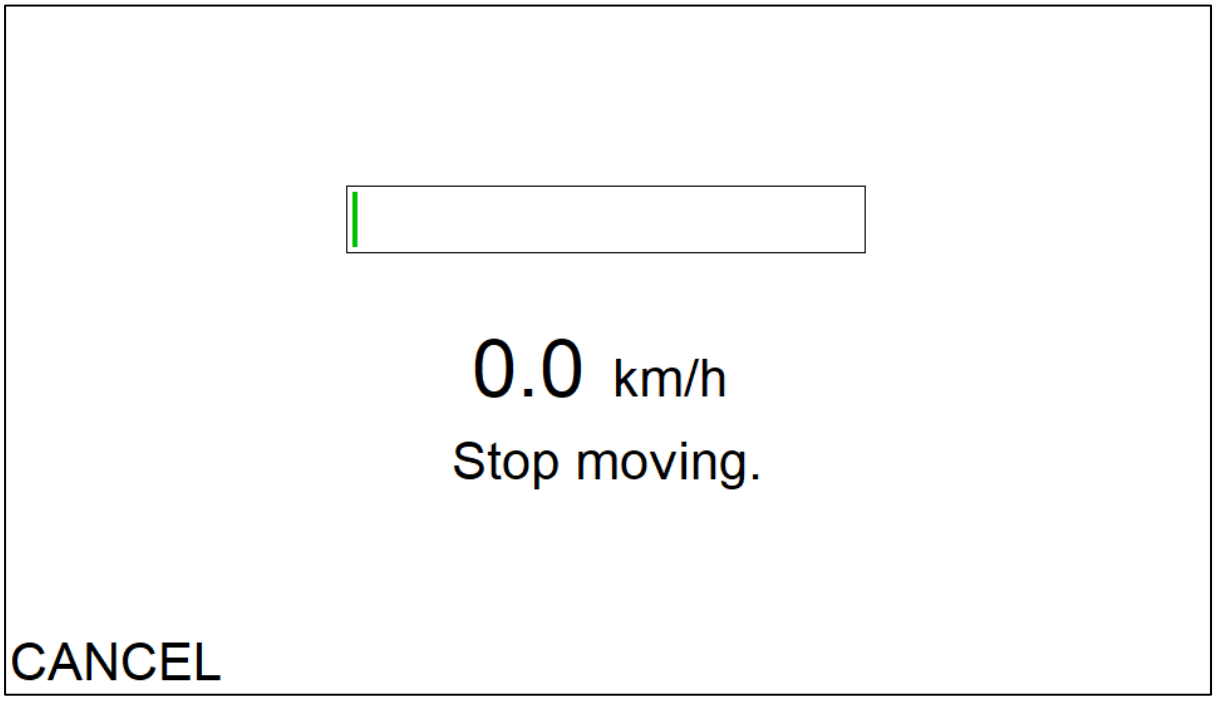
Weight calibration

The weight calibration runs through an automated calibration sequence to calculate the required flow adjust

Step 1

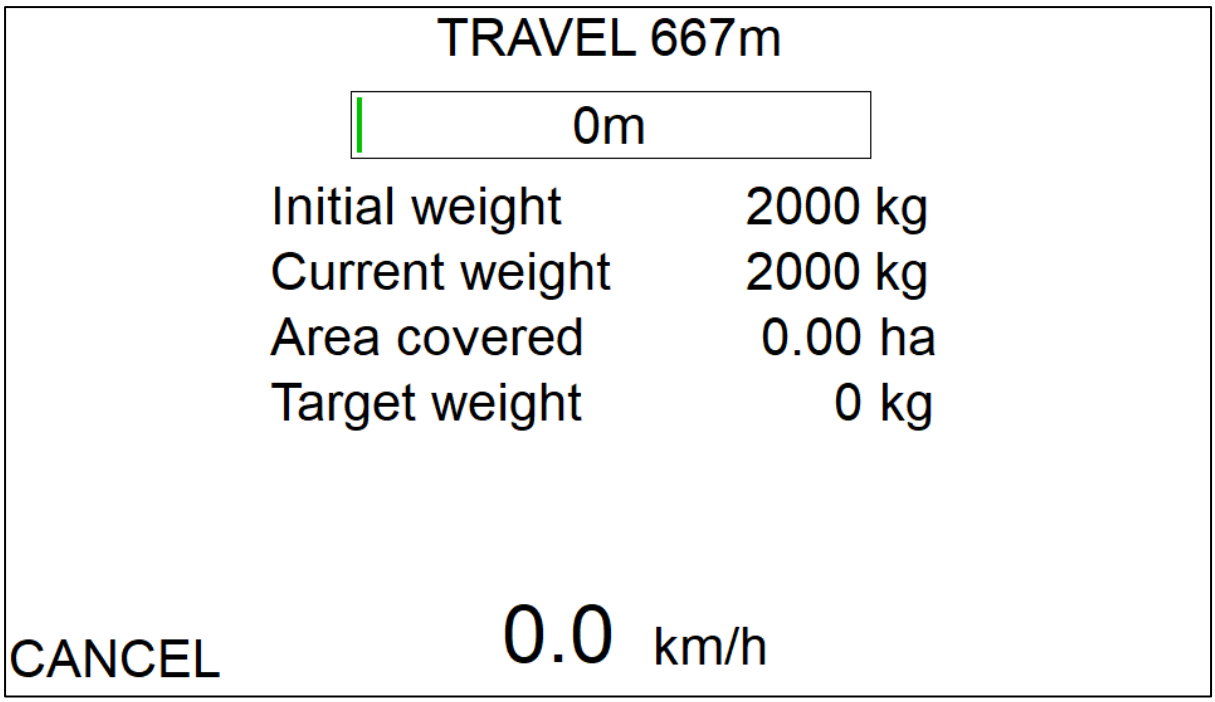
From the spreading calibration screen, press the F2 key

Remember to stop on a level surface to get an accurate weight reading.



When the tractor is stopped, the spreader will wait for a time to ensure the scales are settled before capturing the start weight and resetting the area covered hectare counter.

Step 2

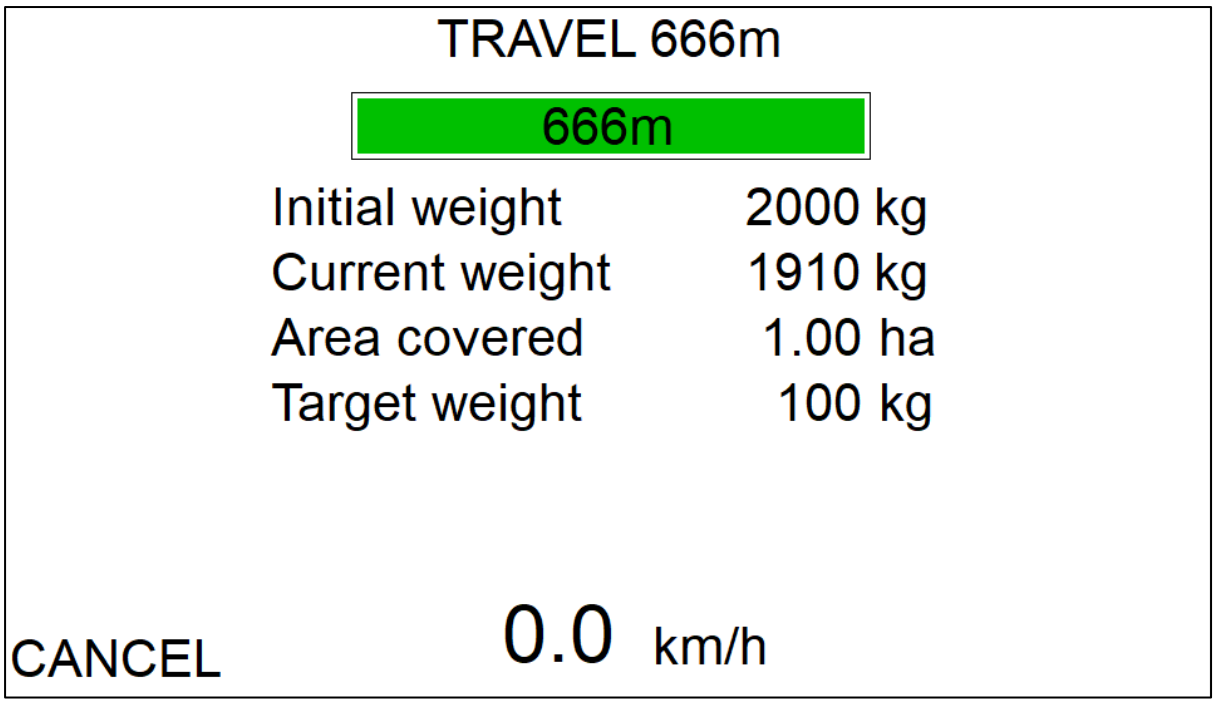


The spreader requires a minimum distance to travel. This distance is determined by the minimum amount of product you want to use to do the calibration.

With the default rate settings shown above and the minimum weight for calibration of 100kg then you will need to travel a minimum of 666m in this example

As you start spreading the green bar will show how far you have travelled in relation to this minimum distance.

When you have travelled the minimum distance, the computer will prompt you to stop when you are ready. NOTE: you can keep going for longer if you wish.



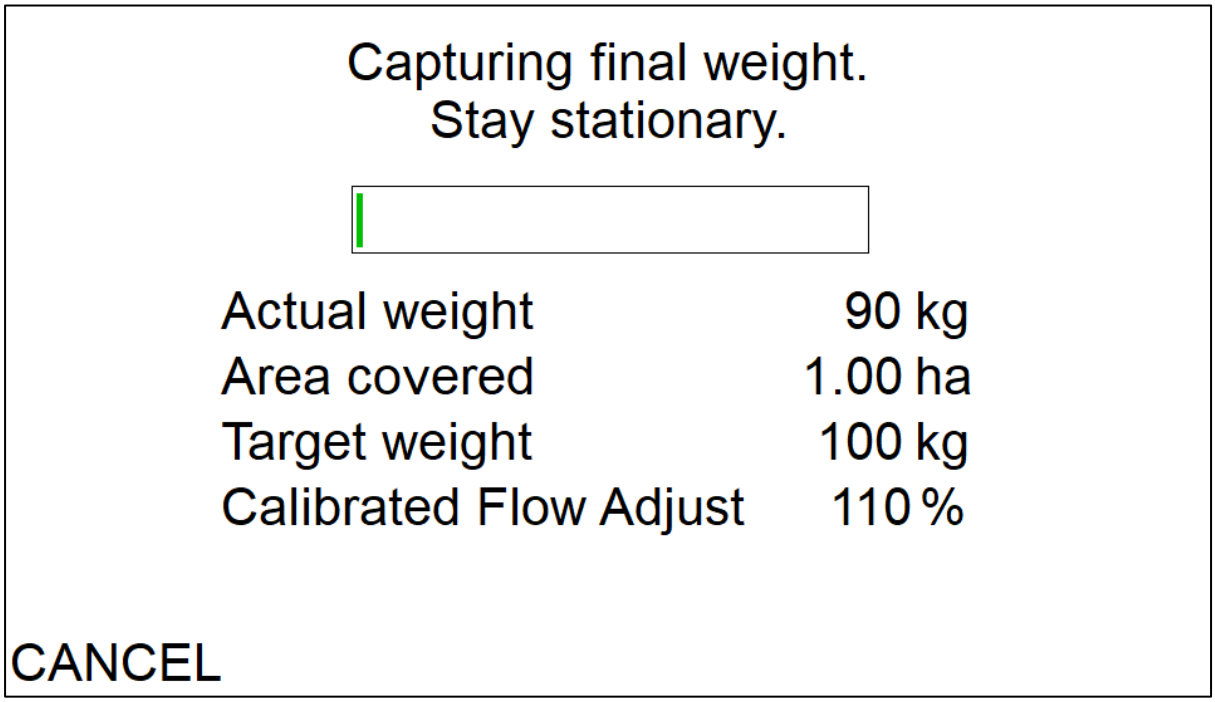
Initial weight	Displays the start weight from step1.
Current weight	Displays the current weight of product in the bin
Area covered	This is the area that you have covered based on the tractor centres that you have entered and the distance you have travelled with the belt moving.
Target weight	As the hectare counter increments, this is the theoretical amount of product that should have spread.

Step 3

When you have travelled the minimum distance, press the OK Key to progress.

Remember to stop on a level surface to get an accurate weight reading.

The controller will capture the final weight in the bin and calculate the values below.



Actual weight	Displays the actual amount of product that was spread.
Area covered	Displays the area that was spread.
Target weight	Displays the theoretical amount of product that should have been spread.
Calibrated Flow Adjust	Calculates how much the flow adjust needs to be adjusted to achieve the required rate.

Press F4 to accept the new calibrated flow adjust, or

Press ESC or F1 to cancel the calibration if any of the data looks incorrect.

Factory settings

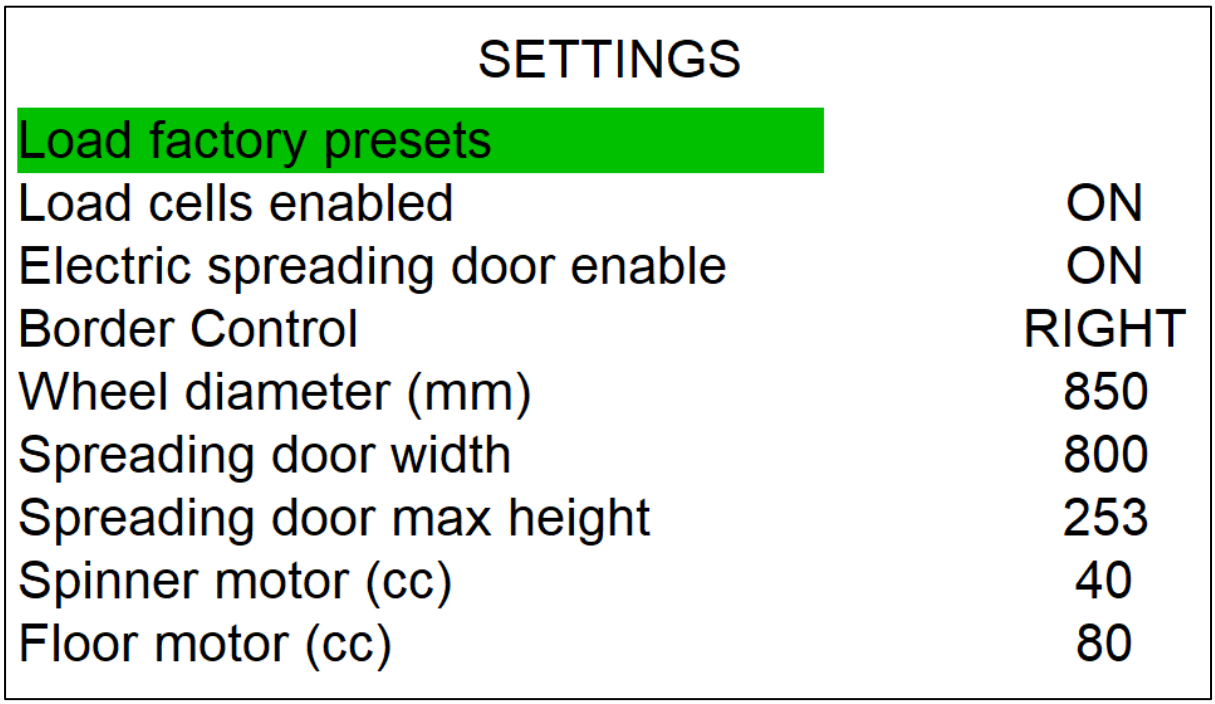
From the configuration screen, press and hold OK for 5 seconds to go to the settings screen.

Use F4 to go to the next settings page and F1 to go back to the previous settings page.

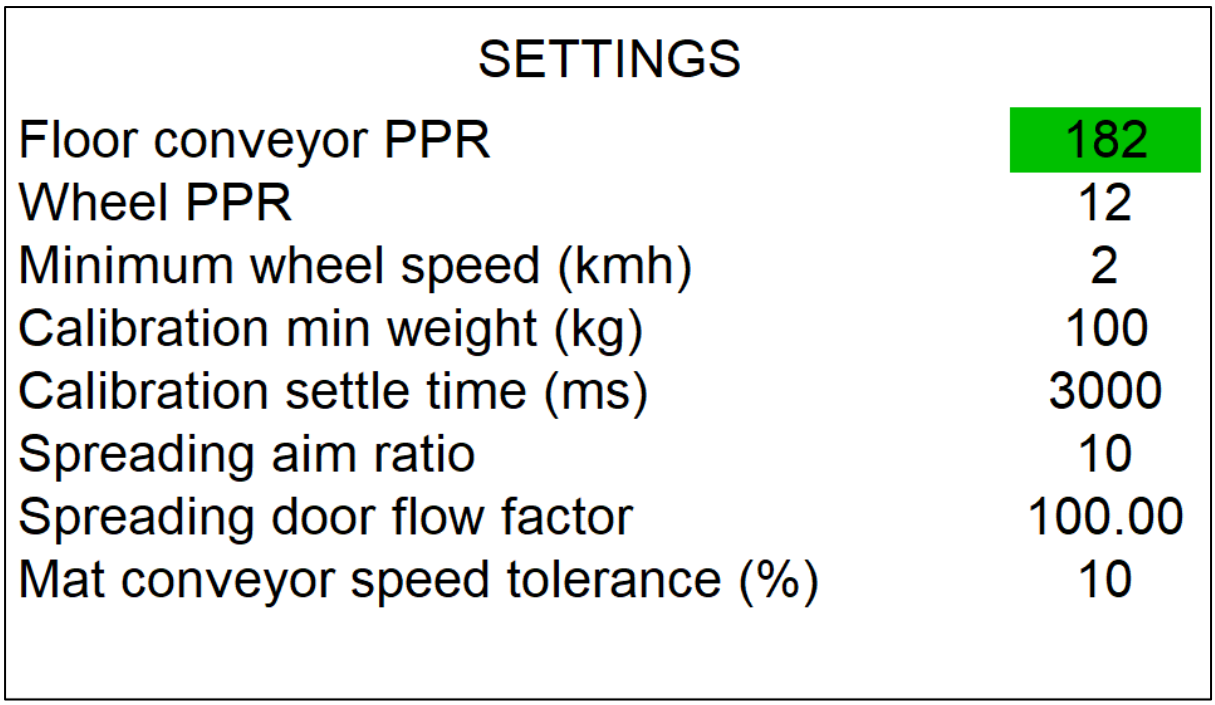
Press ESC to go back to the splash screen.

Use the up/down arrows to select the setting.

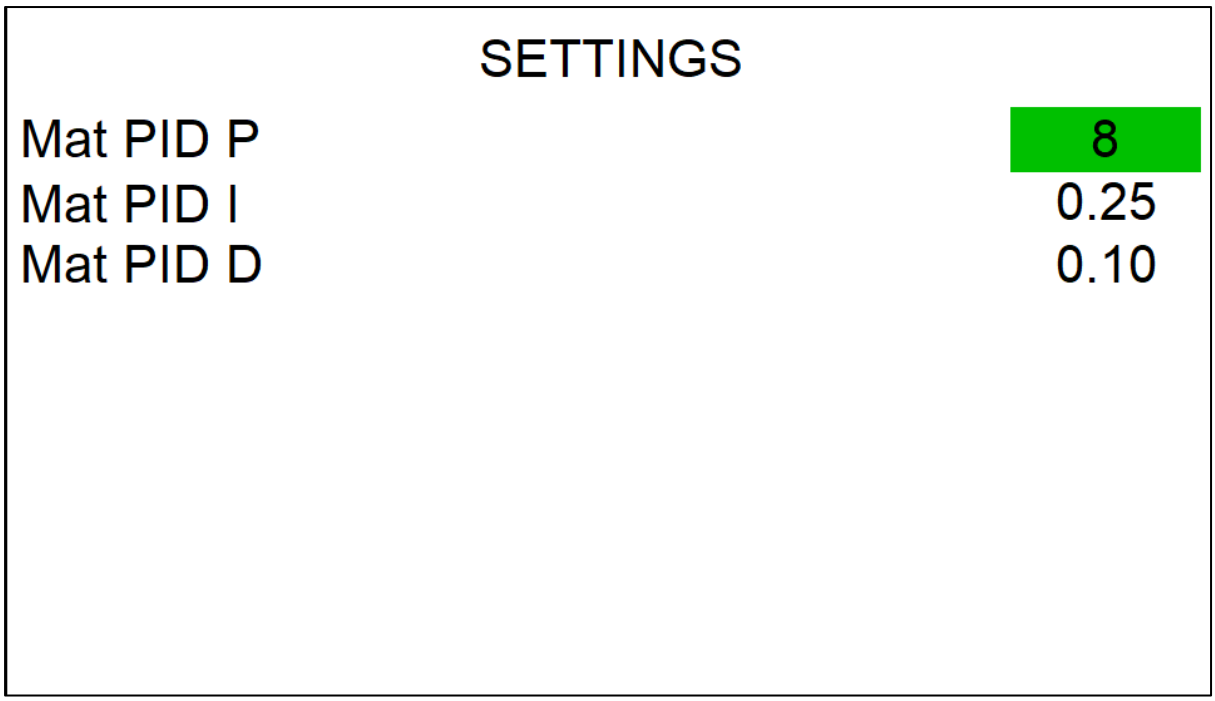
Use the left/right arrows to change the setting.



Load factory presets	Press OK to reset to the factory default settings
Load cells enabled	Used to select load cells if they are fitted
Electric spreading door	Used to select the electric spreading door if fitted
Border control	Used to select which spinner is setup for border control
Wheel diameter	Set the diameter of the wheel to tune the wheel speed to the tractor speed. Increasing the diameter will make the indicated speed slower, decreasing the diameter will make the indicated speed faster
Spreading door width	Select if your spreader has a 390 or 800 wide belt
Spreading door max height	Set this to the max height that the door can be opened For an electric door, see the electric door setup screen
Spinner motor cc	Set the cc size of the spinner motors
Floor motor cc	Set the cc size of the floor motor



Floor conveyor PPR	Set the pulses per rev for the floor conveyor sensor
Wheel PPR	Set the pulses per rev for the wheel sensor
Minimum wheel speed	Set the minimum spreading speed. If the speed goes below this, the floor conveyor will stop.
Calibration minimum weight	Set the minimum amount of product to use for the calibration sequence. For light spreading rates, and expensive products, this will be lower. For heavy rates, this will need to be larger to get accurate readings.
Calibration settle time	Set the amount of time for the weight in the bin to settle before capturing the start and final weights during calibration. 3000 = 3 seconds
Spreading aim ratio	This is the ratio used to calculate recommended door height settings.
Spreading door flow factor	If the spreader is consistently spreading out by the same amount on all products and rates, then this can be adjusted as an “overall” flow factor.
Mat conveyor speed tolerance	If the floor conveyor rpm is this % out from where it should be, then the floor bar will turn red indicating that the floor is not achieving the required rpm.



Mat PID P	Floor conveyor PID – Proportional gain
Mat PID I	Floor conveyor PID – Integral
Mat PID D	Floor conveyor PID – Derivative

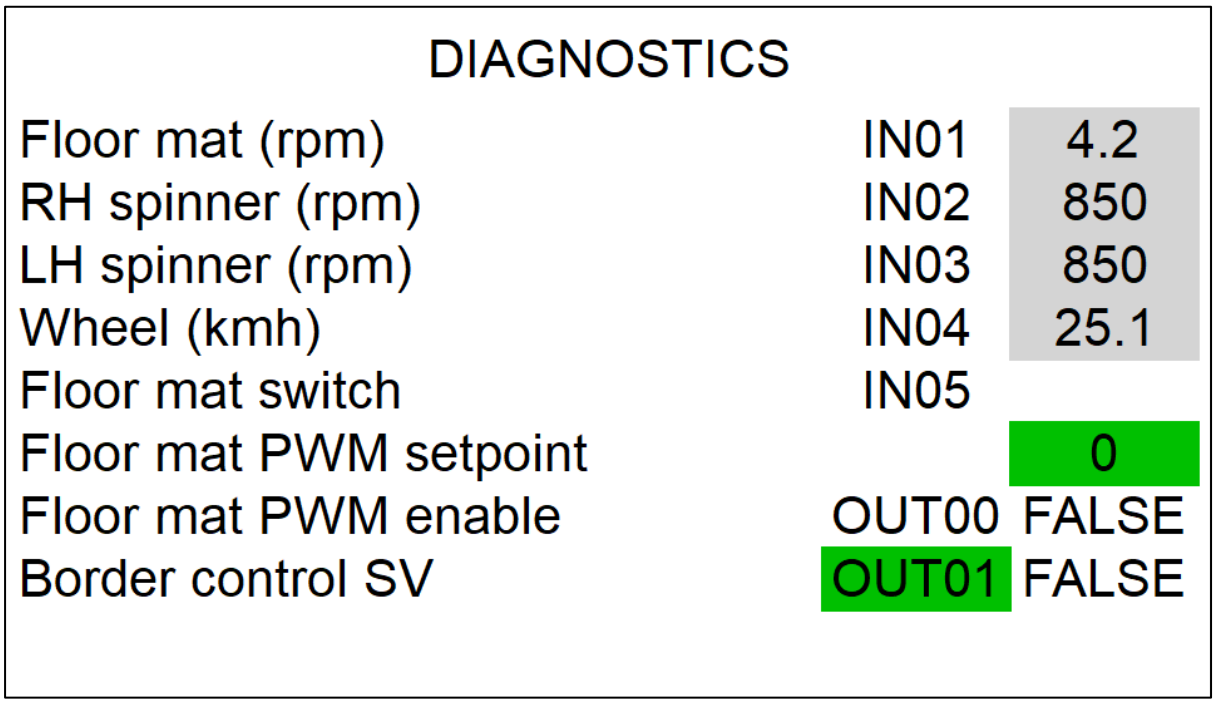
Diagnostics

Manual controls

From the configuration screen, press and hold the F2 key for 5 seconds.

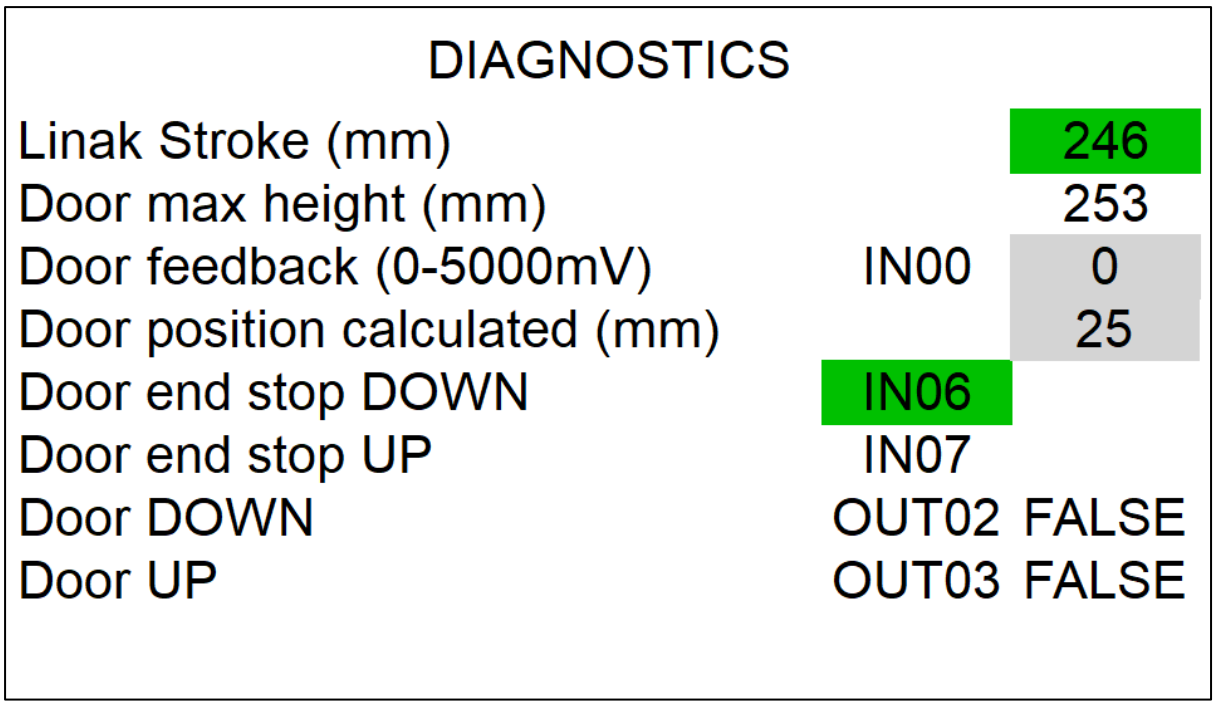
Use F4 to go to the next diagnostics page and F1 to go back to the previous diagnostics page.

Use these screens to monitor and control the controller inputs and outputs



Floor mat	IN01 – displays the floor rpm
RH spinner	IN02 – displays RH spinner rpm
LH spinner	IN03 – displays LH spinner rpm
Wheel	IN04 will turn green ON and OFF when the sensor is triggered. Displays km/h
Floor mat switch	IN05 will turn green ON and OFF when the switch is toggled.
Floor mat PWM setpoint	Adjust this between 0-100% to control the floor conveyor manually
Floor mat PWM enable	Use the left/right arrows to set this to TRUE/FALSE to turn the floor conveyor ON/OFF. The conveyor will run at the PWM setpoint above.
Border control SV	OUT01 – will turn green ON when the output is turned on Use the left/right arrows to set this to TRUE/FALSE to turn the border control solenoid valve on and off.

Electric spreading door settings



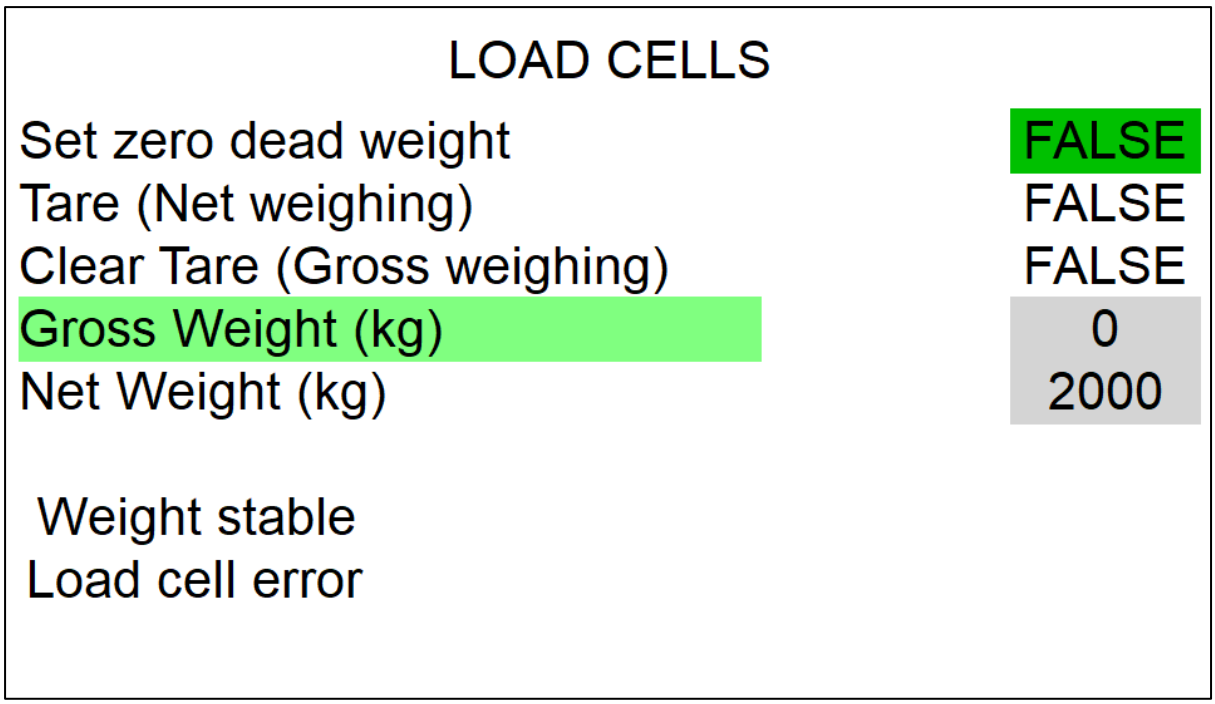
Linak stroke	Set the length of the electric actuator
Door max height	Set the maximum height of the door
Door feedback	IN00 – displays raw mV reading from the electric actuator
Door position calculated	Displays the calculated door position. If the stroke or max height is changed, you will need to run the door full stroke up/down. See calibration procedure below.
Door end stop DOWN	IN06 will turn green when the electric actuator reaches the end of its DOWN stroke.
Door end stop UP	IN07 will turn green when the electric actuator reaches the end of its UP stroke.
Door DOWN	OUT02 will turn green when the output is turned ON Use the left/right arrows to set this to TRUE/FALSE to turn OUT02 on and off to drive the door DOWN.
Door UP	OUT03 will turn green when the output is turned ON Use the left/right arrows to set this to TRUE/FALSE to turn OUT03 on and off to drive the door UP.

Electric spreading door calibration

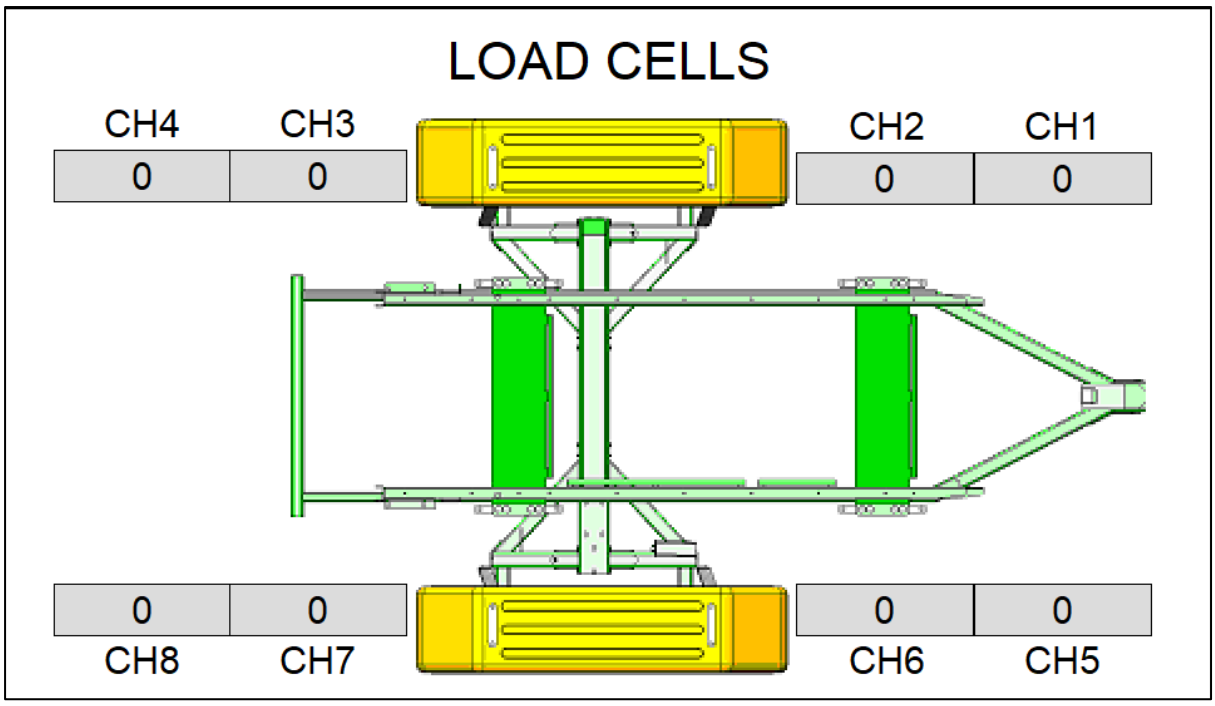
Because full up and full down position does not always equal 0mv and 5000mV perfectly, the door needs to be driven to both end stops to calibrate the door position.

When the door reaches the end stop it captures the respective mV reading and uses a linear scale for max door height at ~5000mV, and minimum door height (= max door height – actuator stroke) at ~0mV.

Load cells



Set zero dead weight	Press the OK button to set the zero dead weight. This sets the absolute zero of the weight of the empty machine bin on the load cells and is retained on power cycle. Clear the tare weight before setting the zero dead weight.
Tare (net weighing)	Press the OK button to set the tare weight. Tare weight is not remembered on power cycle.
Clear Tare (gross weighing)	Press the OK button to clear the tare weight.
Gross weight	Displays the Tare weight (= the weight from where the tare was set)
Net weight	Displays the gross weight (= weight from dead zero)
Weight stable	Will turn green when the scales are stable (not moving)
Load cell error	Will turn red if there is a load cell error



This page displays the individual load cell divisions.

Normally these will be within a few thousand divisions of each other.

If one of these is red, or more than 5000 divisions different to the others, then the load cell may be faulty.

Trouble shooting

Problem	Checks
Floor conveyor not running	Check the floor switch is turned on, the rate button is turned on, and that you are travelling above the minimum speed. Check hydraulics are engaged.
Spreading to heavy	Check the flow adjust is not set to a large number. Between 80-120% is normal. Check door height setting is correct. Is what is shown on the screen, what the door is actually set at?
Spreading too light	Check the flow adjust is not set to a low number. Between 80-120% is normal. Check door height setting is correct. Is what is shown on the screen, what the door is actually set at? Check there are no lumps of product obstructing the door restricting product flow
Spreader not accurate	Check the speedo accuracy Check spreading too light and too heavy above Check floor speed bar If the floor bar is turning red, slow down you speed so that the floor can catchup Are you travelling up and/or down hills and product is spilling out the back? Lower the door height to minimise product flow fluctuations
Speedo not accurate	Check the wheel sensor is picking up on all the wheel nodes. The light on the sensor should turn on for each node. Check the wheel PPR setting Check the wheel diameter setting
Hectare counter not accurate	Check the wheel sensor is picking up on all the wheel nodes. The light on the sensor should turn on for each node. Check the wheel PPR setting is correct Check the wheel diameter setting
Floor speed bar not accurate	Check the sensor is set accurately. Turn the sensor into the gearbox until is stops, then turn it out 2 turns and lock the lock nut.
Floor speed bar is turning red at max position	This indicates that the floor conveyor is doing the maximum rpm that it can achieve. Slow down so that the floor conveyor can achieve the rpm required to be accurate
Floor speed bar is turning red but is not at max rpm	This indicates that the floor conveyor is not achieving the required rpm for the speed you are travelling. Either slow down so that the floor conveyor can achieve the required rpm, or increase hydraulic flow from the tractor for the controller to increase the floor conveyor rpm
Speedo is turning orange	This indicates you are at the max speed that the spreader can achieve accuracy.