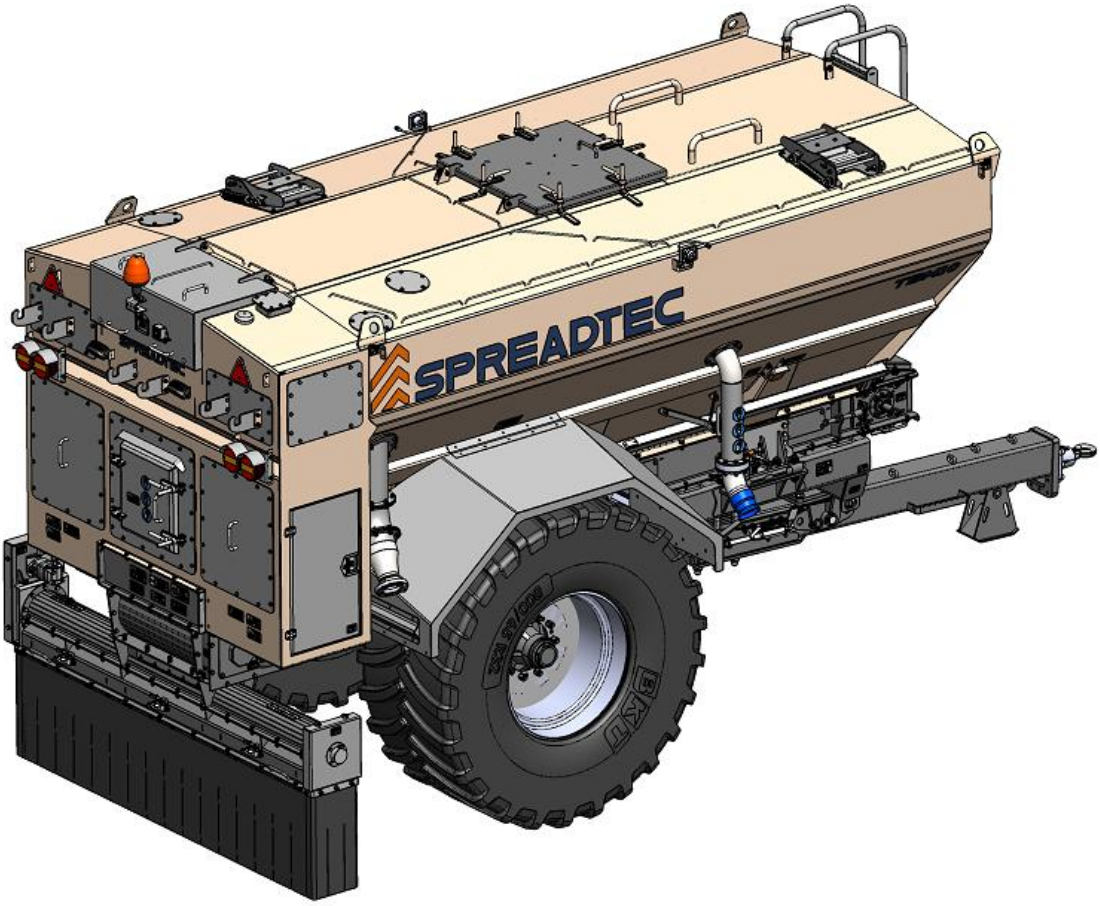


Document Details	
Document Title:	Binder Spreader, TBM/MBM Range Software Manual
Document Type:	Operator / User Manual
Ref No.:	ASD-00106

Version Control			
Revision	**Date**	**Author**	**Comments/Status/Purpose**
0.1	08/04/2024	John McDermott	- Provisional release.
1.0	11/04/2024	John McDermott	- Initial release.
1.1	30/08/2024	Paul McConn	- Logo update.
1.2	04/02/2025	Paul McConn	- Cover page image update
2.0	05/02/2025	John McDermott	- Updated Screen layouts (SW v1.2.1 onwards) - Added Prestart functionality
2.1	24/03/2025	John McDermott	Change from quick start document to full software manual. New version document same file name, replaces older version 2.0.
2.2	01/05/2025	John McDermott	Added notes on filtration during cleaning
3.0	02/05/2025	John McDermott	Customer release.

Approvals		
Department & Name	**Signature**	**Date**
Managing Director	David Murphy	02/05/2025

Contents.

List of abbreviations:

- ST = Spread-Tec.
- AS = Agri-Spread.
- TBC = To be confirmed.
- N/A = Not applicable.
- MS = Mild steel.
- ZP = Zinc plated.
- SS = Stainless steel.
- Kph = Kilometres per hour.
- Mph = Miles per hour.
- mT = Metric tonnes.
- BOM = Bill of materials.
- ASA = Automatic slack adjuster.
- SA = Slack adjuster.
- Kg = Kilogram.
- Lb = Pounds.
- Hp = Horsepower
- HMI = Human Machine Interface (Control System Screen)
- ECU = Electronic Control Unit

Verbal forms:

- Shall = Indicates a mandatory requirement to be followed for fulfilment or compliance with the present standard. Deviations are not permitted unless formally and rigorously justified and accepted by all relevant contracting parties.
- Should = Indicates a recommendation that a certain course of action is preferred or particularly suitable. Alternative courses of action are allowable under the standard where agreed between contracting parties but shall be justified and documented.
- May = Indicates a permission, or an option, which is permitted as part of conformance with the standard.
- Operator = Person in charge of the safe operation of the product and its working environment.
- Machine = Binder spreader unit.
- Spreader = Binder spreader unit.
- Tractor = Vehicle used to draw a trailed spreader.
- Vehicle = Self-propelled vehicle used in conjunction with a mounted spreader.

Document References:

- ASD-00108_Binder Spreader, Mounted, MBM Range, Operator-User Manual
- ASD-00109_Binder Spreader, Trailed, TBM Range, Operator-User Manual

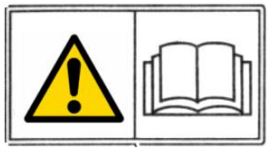
1 Introduction.

This guide is intended to illustrate the workings of the software and control system of the machine. It should illustrate the different functions of the machines control system, and the steps required to utilize each feature of the control system.

Spread-Tec reserves the right to modify the machinery, and the technical data contained within this manual without prior notice.

While every effort has been made in the production of this manual to ensure that the information contained herein is full and correct, Spread-Tec assumes no responsibility for errors or omissions.

Further to this, Spread-Tec assumes no liability for any damages that may result from the use of the information contained within this manual.



WARNING!
Before using this product please read this manual with care. It has been purposely drawn up to necessary information for proper use, in compliance with basic safety requirements.

Note: This is a supplemetary document to operator manuals ASD-000108 and ASD-000109. These documents contain important safey, operation and maintenance instructions which shall be read and fully understood, before using this document.

2 General Spread Instructions.

1. Connect the spreader to the tractor (If applicable), as per instructions in doc ASD-00109.
2. If any safety guards have been removed, re-fit them, refer to doc ASD-00108 / ASD-00109.
3. Power up the control screen and setup the machine and product, refer to section 3 and 4.
4. Perform the pre-operation checklist refer to doc ASD-00108 / ASD-00109. This includes:
    - Hydraulic function check.
    - Loadcell zero / tare routine.
5. Load the spreader as per instructions in doc ASD-00108 / ASD-00109.
6. Perform the pre-charge procedure as per guidance in section 4.
7. Proceed to the spreading location.
8. Open the rear bin door.
9. Verify the spread rate. Test/verify spread rate using test trays, refer to doc ASD-00108 / ASD-00109, and adjust accordingly.

Warning: All persons other than the operator should keep at least 100ft (30m) away from spreading area. The operator should ensure that the spreading area is clear of bystanders before spreading commences.

Warning:

- Keep clear of the auger housing and the rubber skirt at the base of the auger housing during spreader operation.
- Keep clear of the moving transmission components of the auger during spreader operation.
- The auger and meter wheel will continue to rotate for a period of time after the machine has been switched off. Keep hands clear to avoid injury.

10. Spread at the location chosen.
11. The machine will stop spreading when the bin low-capacity message is displayed or when the operator chooses to stop spreading.
12. Close the rear door. Proceed to reload the machine or proceed to emptying the spreader.
13. Return to the loading area. Load the machine.
14. Repeat steps 8 to 14 as required.
15. At the end of the spreading day, perform the bin emptying / clearing procedure defined section 9.

Note: After each working day the spreader should be cleaned to:

- remove build up debris that could alter material flow behaviour onto the meter wheel or rear auger.
- reduce the long-term risk of component failure due to corrosion or stress.

Local environmental legislative regulations should always be followed.

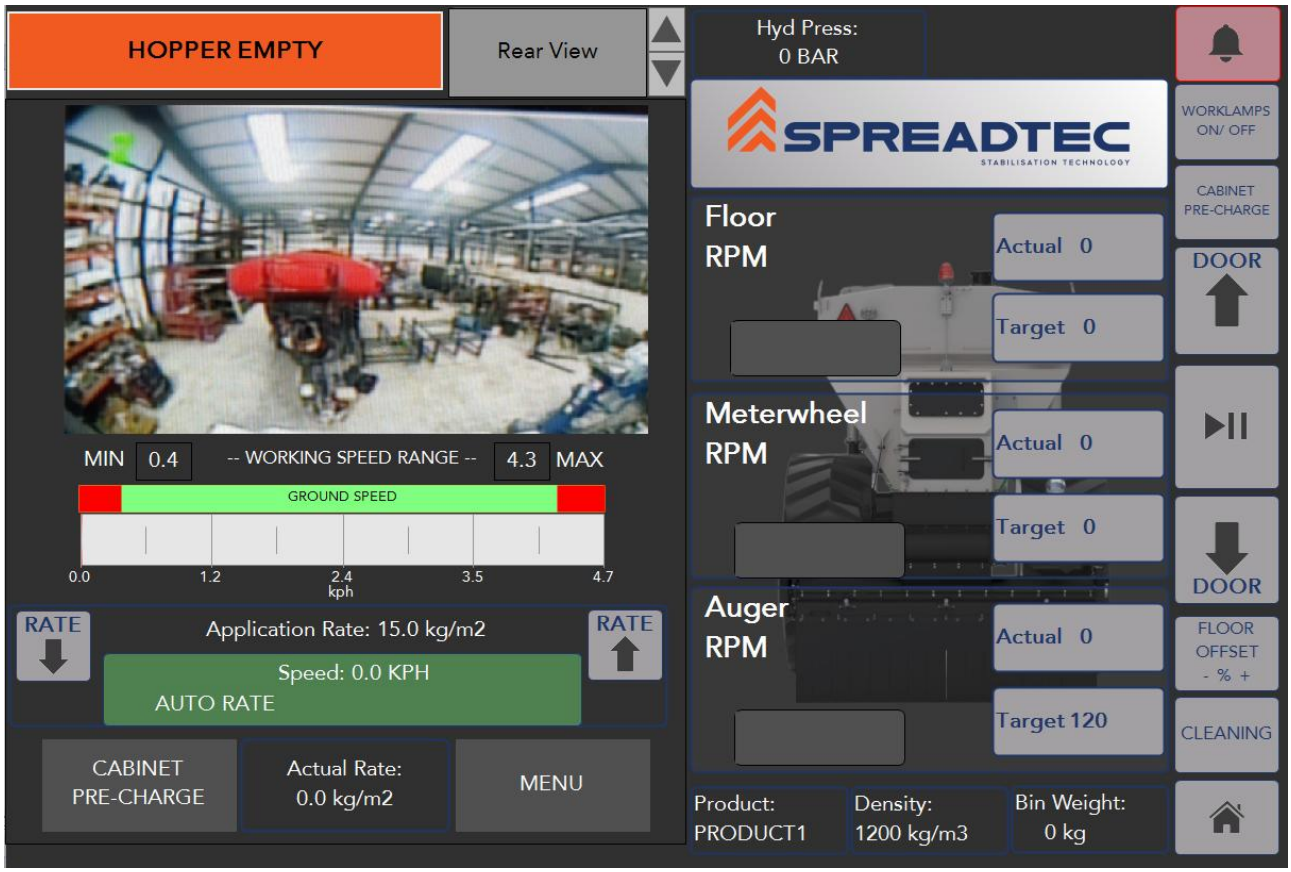
16. If required, disconnect the spreader from the tractor (If applicable), refer to doc ASD-00109.

3 Powering Up The Control Screen.

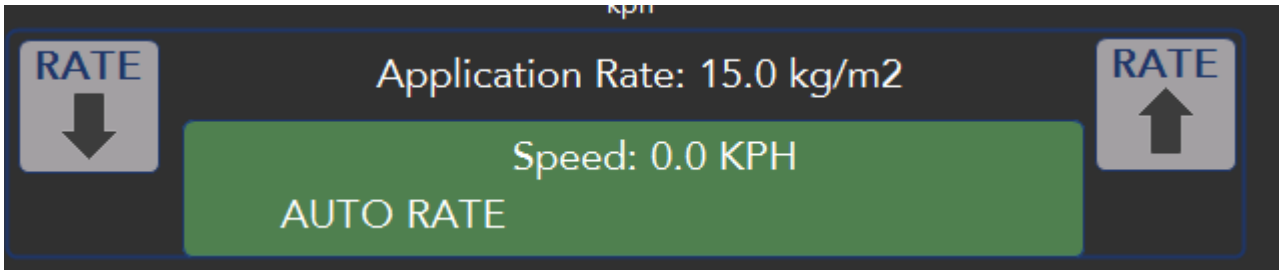
The HMI (touchscreen) is powered up automatically when the main power switch on the harness is turned on. The first screen that is shown is the main menu- from here different screens can be selected as required by the operator.

The system always starts in an OFF state. The system will not spread unless the operator engages the START STOP button illustrated in section 4. The HMI and ECU communicate through Ethernet. Ensure this cable is connected to allow full operation of the machine.
The Operator should start the machine and proceed through the pre-operational checks described in the operator section 2.

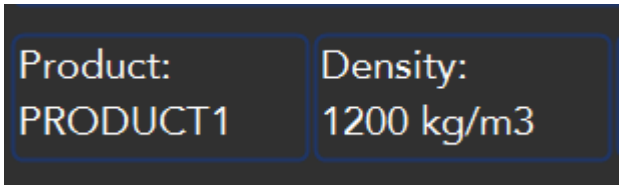
4 Main Working Screen.



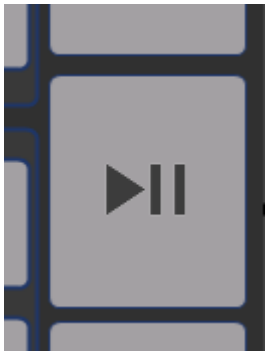
The main screen consists of the following sections:



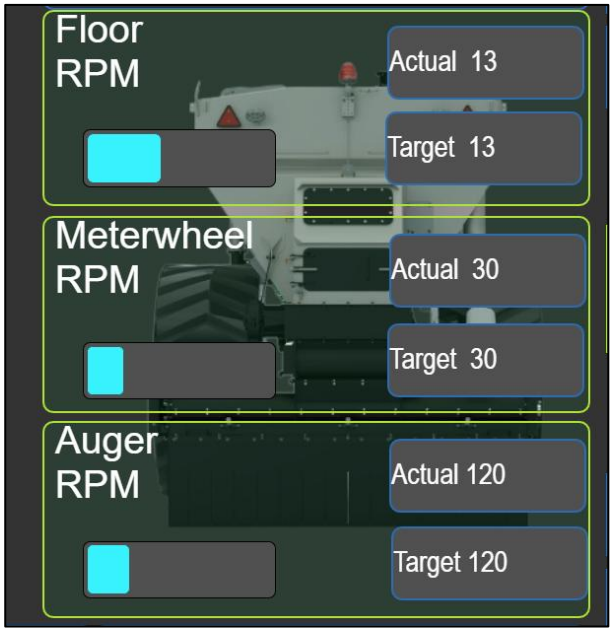
Target Application Rate: Can be increased/decreased using Up/Down Arrows and Keys
Pressing on the value allows the operator to input their own target value.



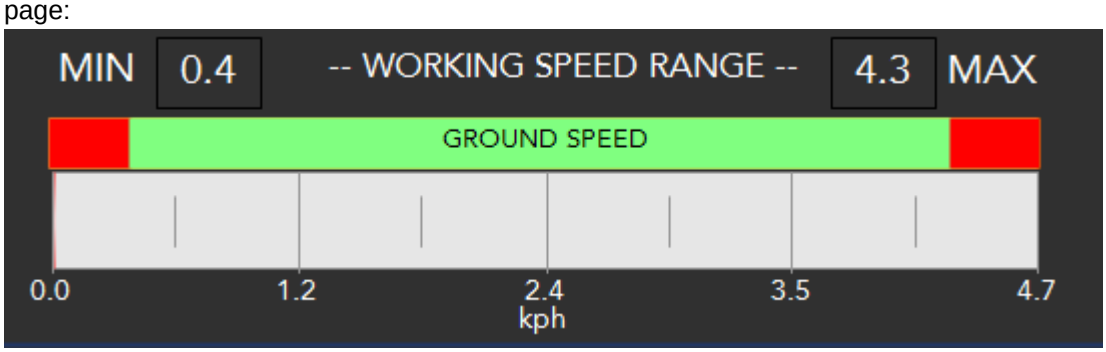
The Product to be used should be selected by tapping product on the main page. This will bring the operator to the product page.
The Product to be used should be selected as described in the product page guidelines below.
On return to the main page, the operator can verify the application rate is set as expected and proceed to the spreading site.
When Ready to spread- press the **START STOP** button.



When finished, ensure the machine is in the OFF state – the **START STOP** button should **NOT** be illuminated.
The Operator should clean the machine at the end of every working day by running the cleaning cycle described in this guide.



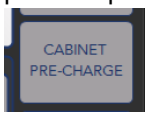
The valve openings for each hydraulic function are illustrated by the blue bar. Target and actual RPMS are shown. Each function illuminates green when running.
The machine will have an optimal operating speed, illustrated with the Speedometer bar display on the main page:



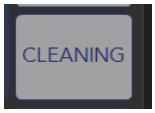
The bar display will automatically adjust depending on the rate selected to show the working window for the ground speed that can be achieved hydraulically. A green bar will indicate where the actual speed is on the machine as it is moving, allowing the operator to see if their ground speed is within the limits of the machine.

The auger RPM can be set by tapping on the auger RPM target value on the screen.

Tapping on **PRE-CHARGE** will run the floor at a preset RPM for a preset time to allow the cabinet to be filled prior to spreading. Further instructions are listed below for this operation.



Press and HOLD on the **Cleaning** button for >3seconds to enter the cleaning page. Further instructions are listed in this guide for this operation.



Tapping on the door Open/close functions will run the hydraulics until the door open/closed sensors stop the hydraulics. When the hydraulics are running the arrows will illuminate in amber colour. If the open/close sensors are not hit within a preset time (5s) the door will trigger an alarm for a jammed state. The position of the door is indicated by green illumination of the side key corresponding to the open/close function.

5 Startup logic.

The system requires the following to allow the START button to latch:

- Door interlocks are in safe position- **CLOSED**.
- Hydraulic Pressure is above the minimum preset alarm limit.

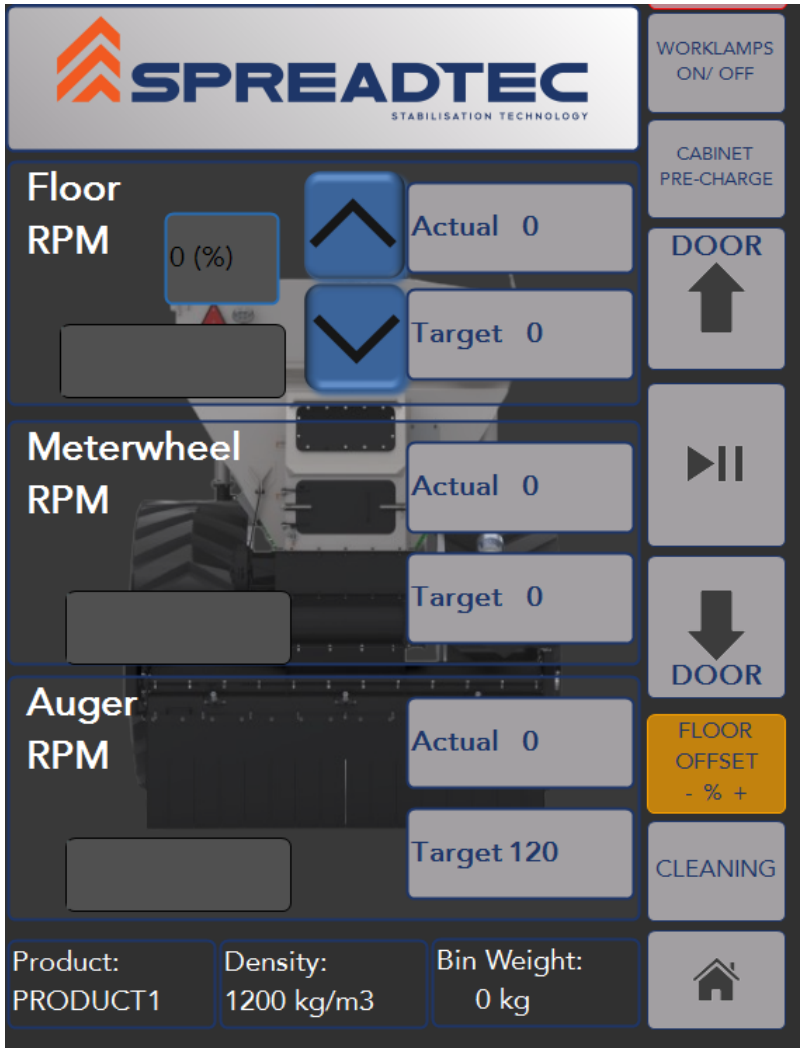
For the system to start spreading:

- The start button must be latched.
- For the floor to run the door must be in the **OPEN** position.
- If Dual speed input is active:
    - The system must see speed from **BOTH** radar and from a secondary speed input:
        - Wheel speed sensor or J1939 from a chassis (mounted models predominantly)
    - This prevents inadvertent startup from something passing beneath the radars field of view.
    - If one of the inputs is not reading the machine assumes static behaviour.

The system will unlatch the START button, stopping the machine from spreading under the following conditions:

- Loss of hydraulic pressure – this ensures if a sudden return of hydraulic pressure will not cause inadvertent startup.
- Motor jam- if any motor is jammed the system will time out and unlatch the start button.
- Any one or more of the safety door interlocks are opened.
- Loss of communication between the HMI and the PLC.

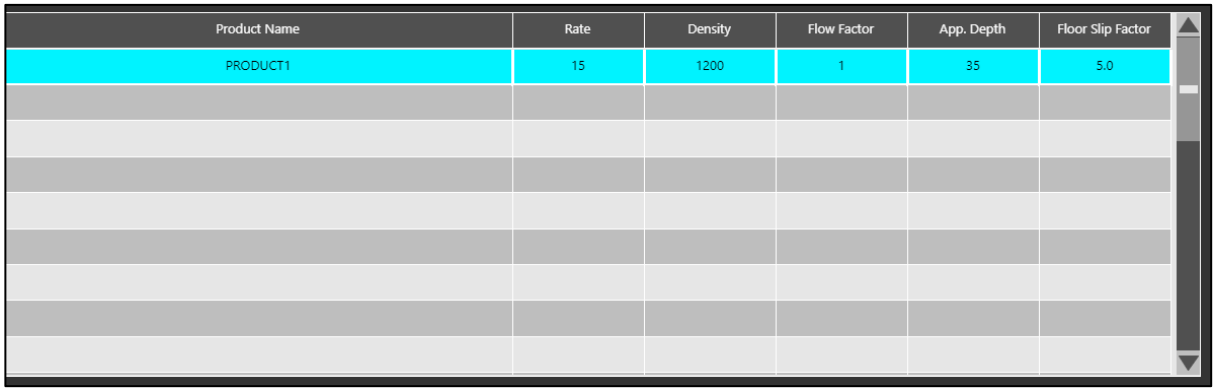
6 Floor Slip Offset.



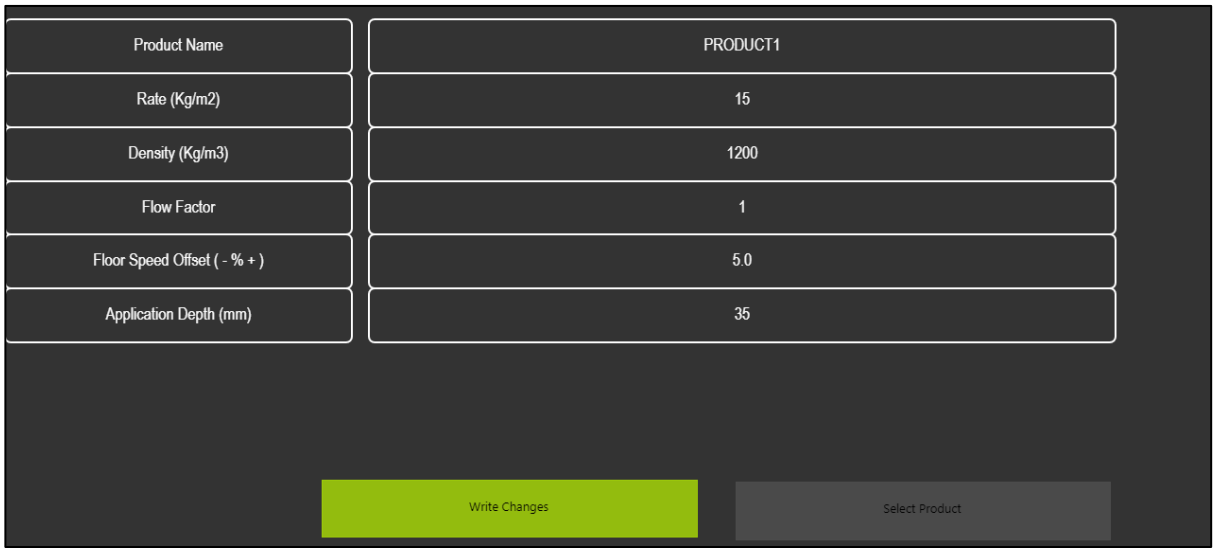
The target speeds for the floor can be offset or nudged if required by the operator. When the **Floor Slip Offset** button is highlighted, the percentage of offset is visible and can be adjusted.

7 Product Selection Page.

The Product that is to be used can be stored in the Product page and reloaded as required by the operator. Tapping on the line in the table will either select the product stored or tapping on an empty line will allow a new product to be stored.

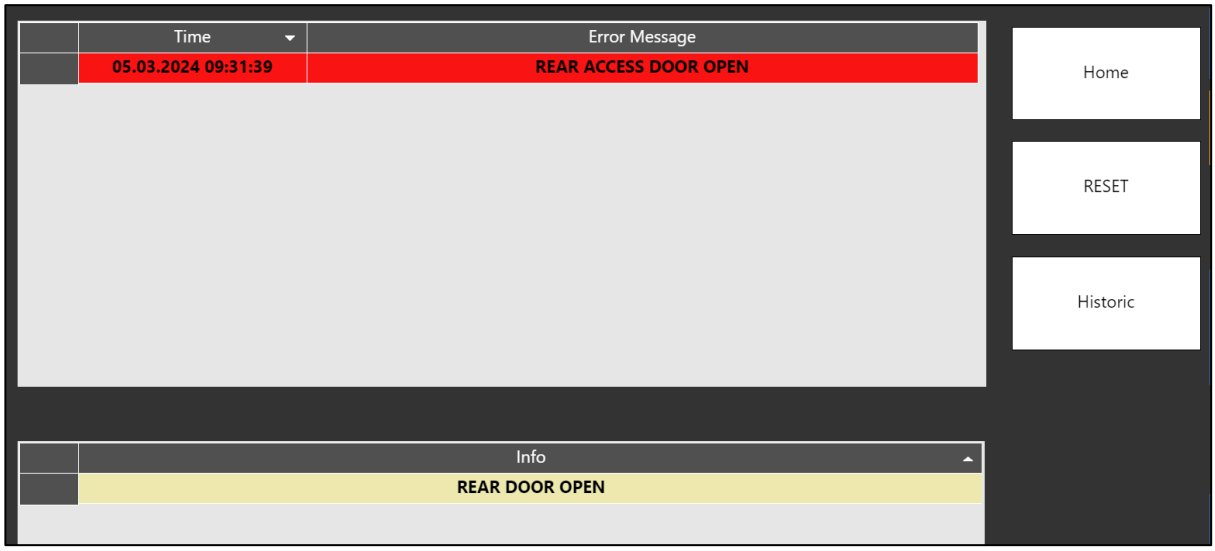


The product parameters can be edited in the fields below
When happy with the data input, **Write Changes** writes the fields to the table for future use.
To select the product for use, Tapping **"Select Product"** will select the current product highlighted.



8 Alarms.

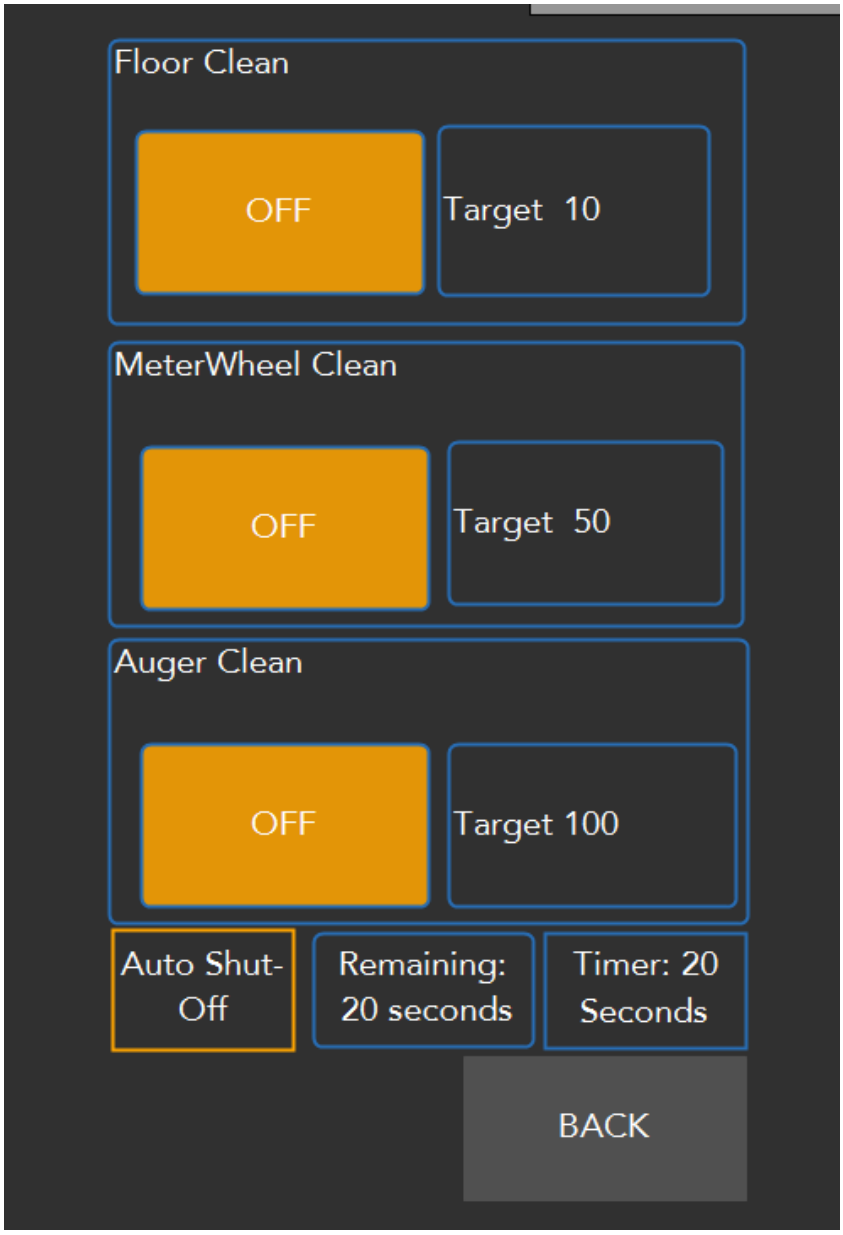
The alarm banner at the top of the page will cycle through any active warnings and alarms. Some alarms will require to be acknowledged and cleared before the machine will recommence. Tapping on the alarm banner will bring the operator to the alarm window.
Errors and faults will be listed at on the top table. The **RESET** button on the side will try to clear any fault when the operator has safely investigated the root cause of the error. A list of previously highlighted alarms can be found by pressing the **Historic** button.



There is a second table below the error table which shows generic information about the state of various components of the machine.

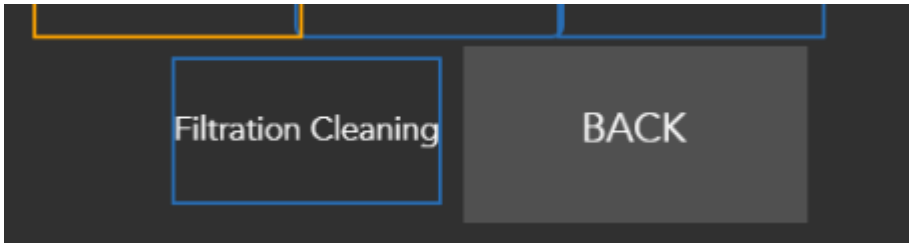
9 Emptying / Cleaning Routine.

The machine can be run in individual sections at the end of a working shift to empty product from the machine by pressing and holding on the **Cleaning** button.
The cleaning window will be shown.
Tapping on the required component to clean will highlight it as shown by the below example.



The system will automatically select any other function that is required to run the cleaning cycle, e.g. selecting the meter wheel to clean will automatically select the auger cycle as well.
Tapping on the start/stop button will start the cleaning cycle.
When the **Auto-Shut off** button is highlighted in **orange**- the machine will run for the preset time that can be configured by the operator by tapping on **Timer.** Otherwise, the machine will run until the start/top button is pressed again. Also on this page, the prestart RPM for the floor for filling the cabinet at the next load can be set.

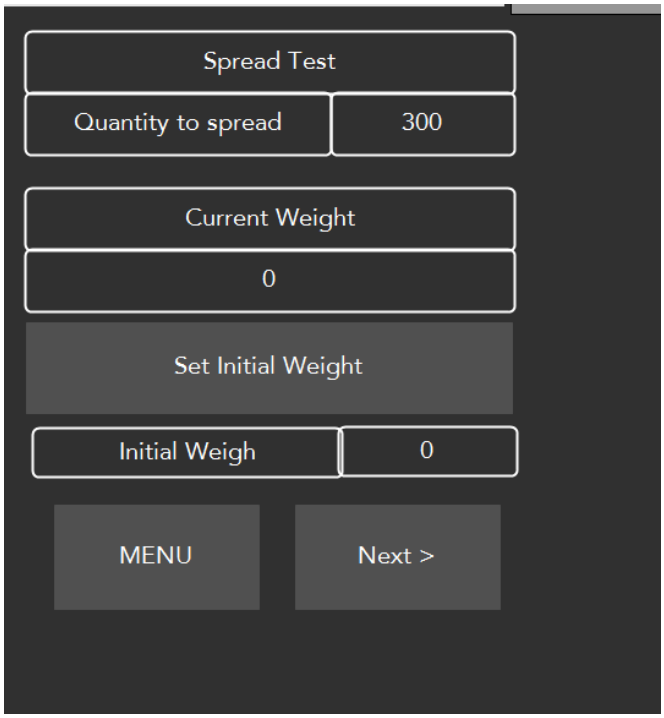
On systems where a filtration system is fitted, the following option will be visible:



When this option is highlighted, the system will undertake a filtration cleaning routine when the machine is undertaking a cleaning cycle. The compressor and pulsing system will operate for the same time the cleaning cycle is set to run.

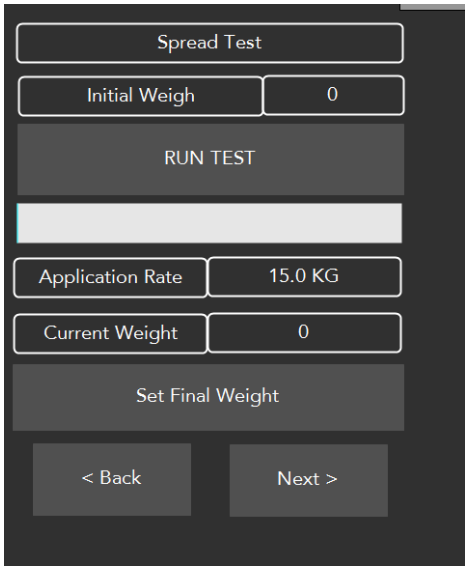
10 Nudge Calibration.

The machines calibration can be adjusted by performing a spread test to adjust or “nudge” the calibration. This is where the machine spreads a theoretical amount and compares the material lost on the loadcells to correct its “real” output.

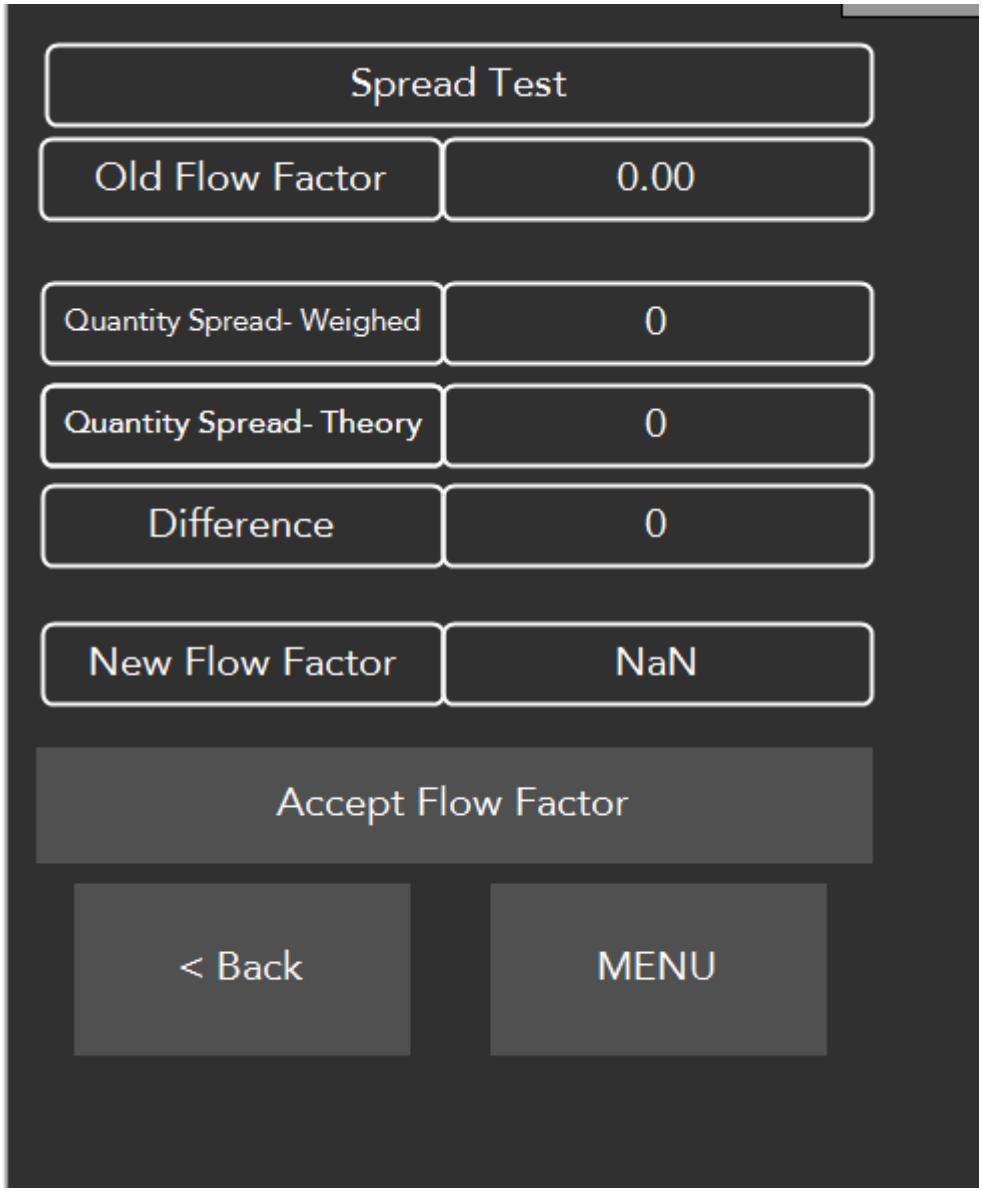


The steps required to run the spread test are as follows:

1. Enter the quantity the operator wishes to spread to perform the test. Tap on the figure **next to the Quantity to Spread** button to enter the quantity required.
2. When machine is steady and weight readings are steady, tap **Set Initial Weight.**
3. Move to the next page **Next>>**



4. When ready to start the test press **Run Test**. The machine will spread as normal when the operator starts to move the machine. The machine will stop spreading when the Theoretical quantity spread is reached.
5. Allow the machine to settle and weight readings to settle to a steady state.
6. Press **Set Final weight**. The current weight reading will be then compared to the initial weight to calculate the actual quantity of product spread.
7. Move to the next page to review the test by pressing **Next>>**

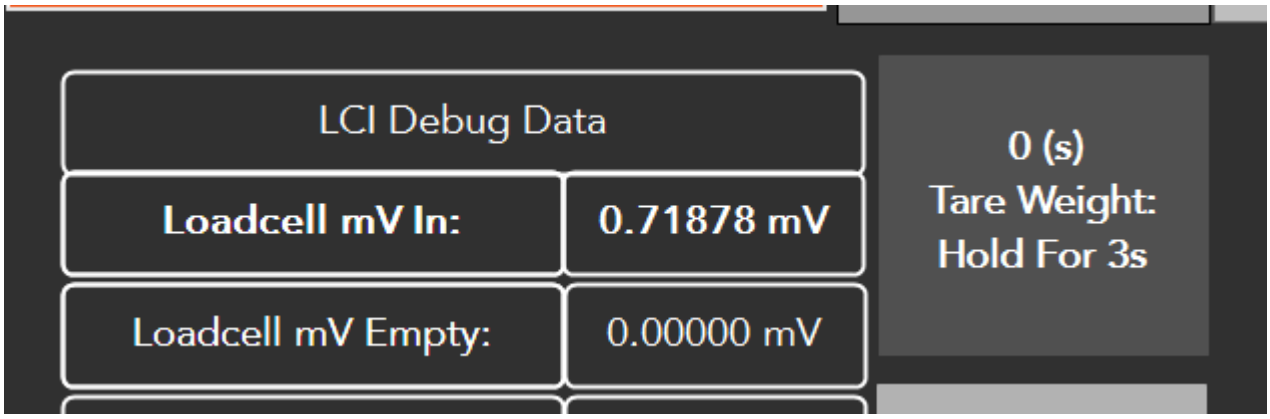


8. This flow factor can be applied by pressing **Accept Flow Factor**

11 Zeroing / Taring the Loadcells.

The loadcells will need to be tared or “zeroed out” prior to filling or spreading material with the machine. This can be done by going from the **Menu >User Calibration > Loadcell calibration**.

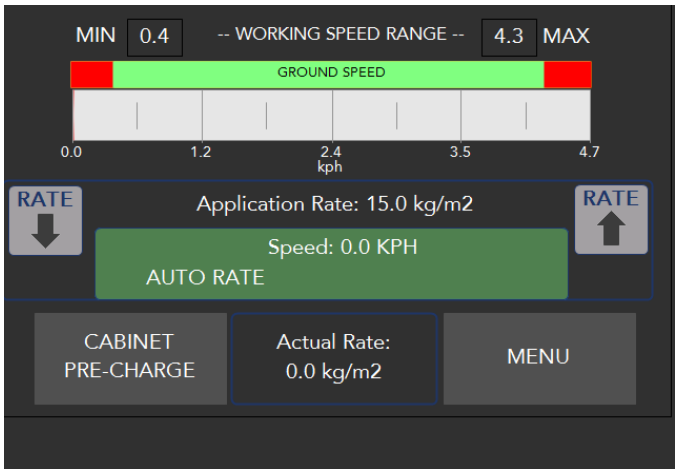
When the operator is satisfied the machine is empty, Press and HOLD the **Tare Weight** button.



This will zero the current weight of the loadcell to correct the readings when the machine is filled. The operator can return to the working screen to commence filling.

12 Different Startup Modes

The machine can start up in 3 different starting manners, depending on how quickly the operator would like spreading to commence (for example along a boundary fence).



By pressing on the centre of the green area on the work page will bring up the starting settings.

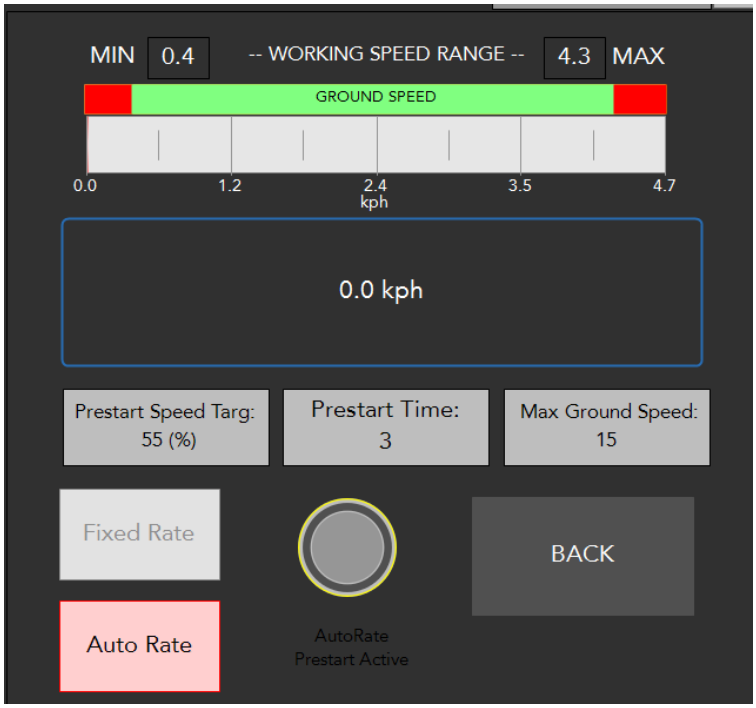
The modes are described as follows:

Fixed Rate:

The machine will ignore the wheel speed and/or Radar sensor and assume a fixed ground speed. Motor speeds for the metering wheel and floor will be set according to the speed selected by the operator


MIN
0.4
-- WORKING SPEED RANGE --
4.3
MAX
GROUND SPEED
0.0
1.2
2.4
kph
3.5
4.7
KPH
3.0 kph
KPH
FIXED RATE CONTROL
Prestart Speed Targ:
55 (%)
Prestart Time:
3
Max Ground Speed:
15
Fixed Rate
BACK

Auto Rate:
The machine will monitor the wheel speed sensor. On initial movement of the wheel, the machine will assume a preset speed (selectable by operator as a % of the ideal working speed range for the given application rate. After the Prestart time has lapsed, the machine will return to using the ground speed sensors. This allows the machine to start with a quicker response than from ground speed sensors alone.



Auto Rate + Prestart:
This follows the same concept as Auto Rate with one addition. As soon as the Start Stop Button is pressed, the machine will assume the preset target speed for the prestart time. This can be used to an operator's advantage in a very tight area, where the operator can manipulate the timing of pressing of the start button with the movement of the machine to eliminate and empty patch at the start of a very tight run.

No mode selected: The machine rate will follow the ground speed sensors solely. Note: the ground speed sensors can have a short delay in detecting initial movement or creep, especially at low speed.

13 Filtration System (Optional)

Systems fitted with the exhaust filtration system will have the following controls to work with:
Steps required to start filtration:

- Spreader START button is unlatched.
- Hydraulic pressure is above the minimum low-pressure target.
- The filtration access door interlock is safely closed
- On opening either of the filler point handles the following sequence will commence:
    - The compressor will start
    - Pressure will start to build in the pneumatic system
    - A series of pulse valves will dissipate air through filters at regular intervals
- If the filler handle is closed within 15 seconds of opening:
    - The compressor and filtration sequence will stop immediately
- If the filler handle is closed after 15 seconds of opening:
    - The compressor and filtration sequence will run to a preset time out.
- If the filler handle is closed or pressure is lost, the sequence will cut out and need to be restarted by repeating the above conditions.
- This sequence can also be triggered when a cleaning cycle is ongoing- see Chapter 9 Emptying / Cleaning Routine.

Spread-Tec International,
Running Gear Limited,
Coolnaha South,
Ballyhaunis,
Co. Mayo,
Ireland
F35 Y157
Phone: 00353 (0)949631808
Email: info@spreadtec.net

Reeds Construction & Engineering Ltd,
The Old Brickworks,
Broadway,
Market Lavington,
SN10 5RH,
United Kingdom
Phone: 0044 1380 816516
Email: info@reedsltd.co.uk