EXCEL Agriculture

SmartAGSystems

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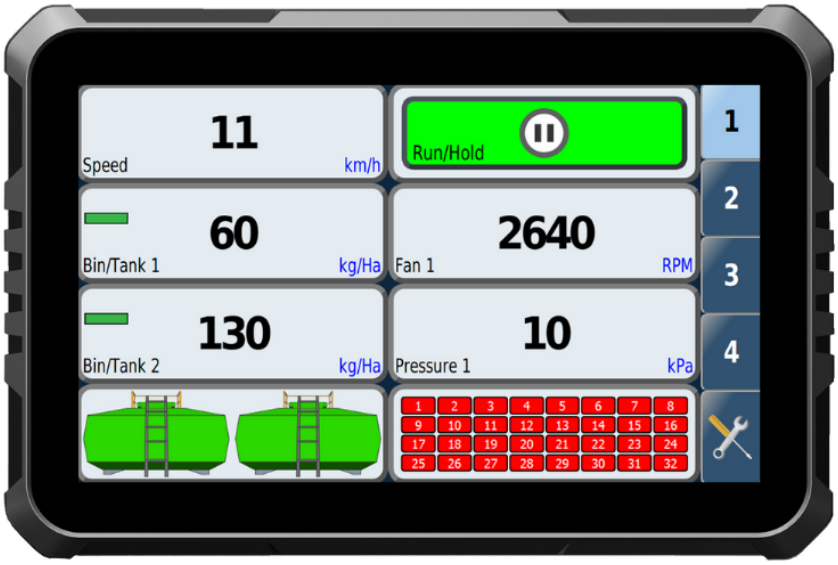
7500 SEEDER CONTROLLER



Operator's Manual

(07) 4636 9100

info@excelagriculture.com.au

excelagriculture.com.au

74/92 Buckland Street,
Toowoomba City QLD 4350.

This guide is to be printed and kept with the 7500 total 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 2020

TABLE OF CONTENTS

Introduction	2
Technical Specifications	3
7500 Seed Rate Controller	4
Start Guide	5
7500 General Overview	6
Device Menu Overview	9
Machine Setup	15
Tank Setup	33
Fine Tuning Calibration Factors	53
Setup (1) - Overview	54
Jobs (2)	54
Alarms (3)	60
Maintenance > System (4-1)	65
Maintenance > Users (4-2)	71
Maintenance > About (4-3)	74
Maintenance > Test (4-4)	75
Screen & Layout Setup	76
Display	80
Front Screen Control	83
7500 Menu Layout (Tank)	84
7500 Menu Layout (Machine)	85
7500 Menu Layout (Display)	86

INTRODUCTION

About the 7000

The 7000 series is a versatile monitoring and control device that is capable of interfacing with many agricultural systems.

A 4.3” colour touch screen provides a simple but powerful interface for operators as well as providing the ability to monitor multiple inputs at once.

The display is fully configurable to show any combination of monitored values in both metric and imperial units. It is also configurable to let the operator control the system outputs by selecting onscreen buttons.

The 7000 series devices have connections for a monitoring camera as well as many different input and output connections depending on the system configuration. Inputs and outputs to the 7000 series devices can all be set with alarms to notify the operator if anything goes beyond set low/ high/ proportional thresholds.

The 7000 terminals can be used in many agricultural applications including but not limited to:

- Spray Controller Model 74V1
- Variable Rate Controller Model 7500
- Spreader Rate Controller Model 7300
- OEM & Custom application Model 7XXX

About this guide

Read this operating manual before commissioning the 7000 terminals. Keep this operating manual where it is accessible to all users at any time. Every person who is assigned to commission or operate the 7000 must have read and understood the operating manual and the safety instructions in particular!

This operating manual contains instructions that must be complied with for your personal safety and in order to avoid damage to property.

Failure to follow these safety instructions could result in fire, electric shock, or other personal injury or damage to the 7000 terminal or other property.

TECHNICAL SPECIFICATIONS

Housing	• RAM Style mount, orientation landscape • Approx. W 142 x H 98 x D 49 mm, excl. connectors and cables Weight < 1 kg
Display	4.3”, 16:9, TFT, trans missive, 480 x 272 pixels 400 cd/m² max brightness, 400:1 max contrast H ±60°, V ±55° max viewing angle, resistive touch screen
Processor & Memory	**32-bit, 532 MHz, I.MX35** **256 MB DDR2, 1 GB Mass Storage, 32 kB serial EEPROM**
Interfaces	• 2 CANbus ISO 11898, • CAN specification 2.0 B active • 1 RS-232 (RxD, TxD, GND only), EIA-level • Optional 4 analog or digital inputs (selectable via software), 3 digital outputs • 1 USB 2.0 full speed on main connector • Optional Ethernet 10/100 Mbit.
Video	**Optional 1 Composite CCITT video input**
Connectors	• Main: AMP Seal, 26 pin • Analog/Digital I/O: On main connector • USB: On main connector • Ethernet: 4-pole round connector, • M12, D-coded • Video: 5-pole round connector, • M12, B-coded
Power Supply	**Max tolerable 8 – 36V DC**
Environmental Conditions	• Temperatures • Operating –30° to +75°C • Storage –40° to +80°C • Protection IP 67 and IP 65 • True outdoor. • Vibration 5g @ 57 – 2000 Hz, 150 h per axis • Shock 30g, 11ms, 10 times per axis
Operating System	**Embedded Linux®**

7500 SEED RATE CONTROLLER

Overview

The Smart AG Systems Seed Rate controller 7500 was developed to provide advanced seed rate control capabilities whilst maintaining an extremely simple **Tile & Tab** user interface.

The controller has a variety of selectable display and control options that can be configured to suit a specific application or user preference. The controller options and calibration setup can also be locked to limit operator access.

The optional switch box controller incorporates 6 Bin/Tank control switches, master on/ off control and up/ down rate control.

The 7500 can control hydraulic, electric drive or linear actuators.

A large colour LCD (Liquid Crystal Display) touch screen provides all the information required to operate the device in one view including direct readouts for rate, speed, tank level, trip area, trip volume, time and pressure (optional when used with liquid). Special icons indicate active control options.

Seed records are maintained for virtually an unlimited number of paddocks (memory dependent) in the **Jobs** screen and may be exported in CSV format via USB to a Windows or Apple-based record keeping program.

The controller may be operated in automatic, manual or GPS (Slave/ Task) mode - variable rate map (VRC control via Shape File). In Automatic and Slave mode, the control drive responds automatically to speed to maintain the target rate. Manual increment and decrement of the target rate is also possible.

In Slave/ Task mode, the controller will accept rate commands from a separate guidance/ task computer linked to GPS and simultaneously report back on rate applied for the purpose of rate mapping and verification of seeded area. (NB. Some of these features are still under development)

In the event of an error, an audible warning alerts the operator by displaying a red tile (assuming that this function has been selected on the display) text on a tab which can then be selected to explain the fault.

The 7500 terminal is connected via CANbus to provide drive control and sensor feedback

A standard wheel sensor can be supplied for ground speed pickup or a radar speed sensor may be connected using the inbuilt radar interface. Alternatively, a GPS can be used to provide ground speed.

STARTUP GUIDE

The 7500 will be set up with basic screens and layouts provided by factory defaults.
NB: Factory defaults may differ if the 7500 is setup OEM specific.

Use new software for front screen

For optimal setup of the 7500, the steps below should be performed in the following order:

1. Set up CANbus/UniPOD (If Auto Detect does not work) **Page 31**
2. Set up your machine **Page 15**
3. Set up your implement/section width **Page 25**
4. Set up your speed (wheel/GPS) input **Page 27**
5. Set up your tank **Page 33**
6. Set up your metering drives/valve **Page 37**
7. Set up your jobs **Page 54**
8. Set up your alarms **Page 60**
9. Set up/change your screen layout **Page 76**

SAVE YOUR SETTINGS & BACKUP TO DEVICE & USB – PAGE 69

7500 GENERAL OVERVIEW

The following pages are intended to provide a brief overview only.

Setup instructions can be found by following the page number directions.

LED status lights - Overview

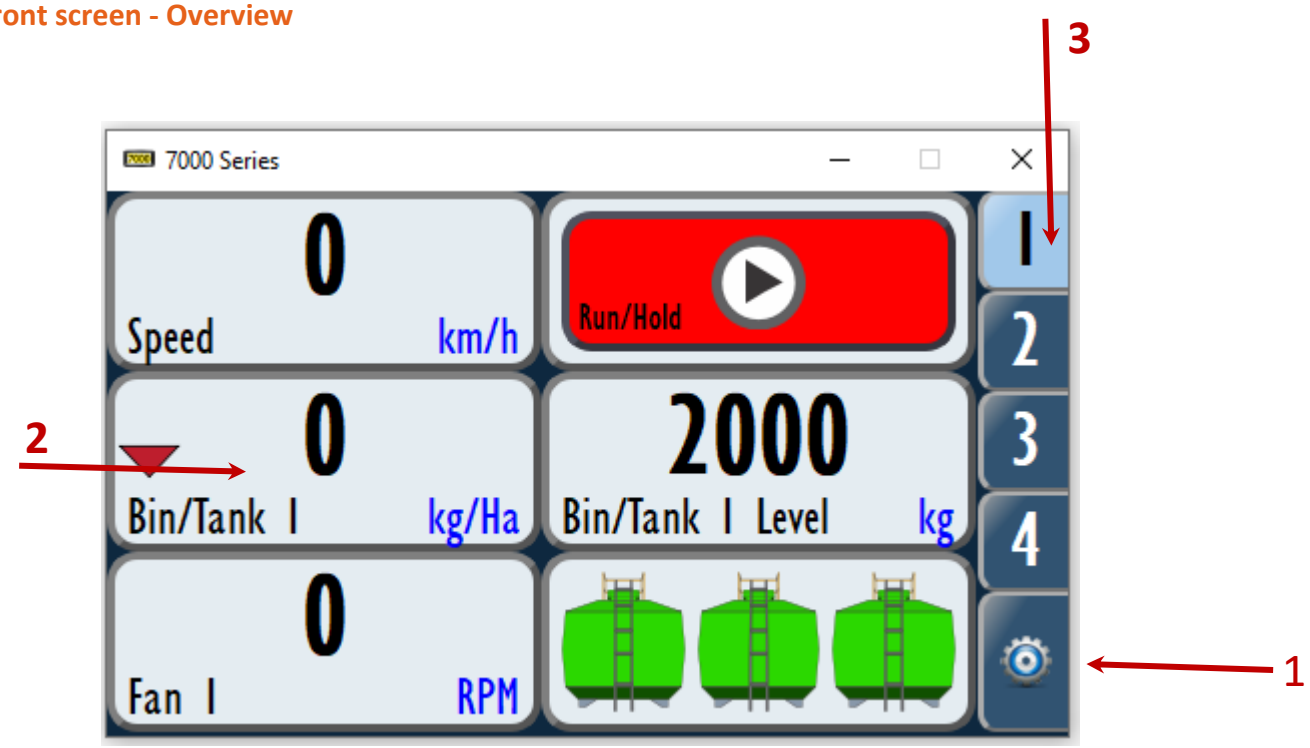
The 7000 has two (2) status indicators on the right hand side of the screen.

These indicators can be useful for troubleshooting and are described below:

Use new software for front screen

Colour	Status	Explanation
Red	Flashing	Software crash (screen freezes)
Red	Solid	Alarm is on and has not been reset
White/Light Blue	Solid	No connection to UniPOD
Blue	Solid	Seeder in manual RUN mode *(Control valve/drive or rate is being calibrated/tested/manually controlled)*
Green	Solid	Seeder in normal RUN mode *(Control valve/drive or rate is being calibrated/tested/manually controlled)*
Green	Flashing	Seeder in HOLD mode

Front screen - Overview



1. **Settings Menu**
    a. Select the **Settings** tab (represented by the **Settings** icon which looks like a gearwheel) once to display the **Settings** menu.
    b. Select an option by pressing one of the icons in the **Settings** menu.

2. **Display Tiles**
    a. A display tile can show a value, unit and title for any given recorded data (speed, pressure, tank levels, Bin Rate etc.).
    b. Individual display tiles can be connected to create larger tiles (for instance, similar to the tank control widget).
    c. Display tiles can be edited by holding down a finger for 1 second on the tile.

3. **Front Screen Tabs**
    a. Different tabs display different sets of display tiles to the left of the screen. (In the example above 4 customisable tabs and 6 tiles are displayed.
    NB: the bottom right tile is used to display the “Tank Control” widget)
    b. Selecting each tab will change the **Front Screen** display to show the available tiles for that tab.

Settings menu - Overview

The **Settings** menu allows for the setup of the 7500.

Select the **Settings** tab (5th tab) from the **Front Screen**  (it looks like a cog).

1. **Setup Menu**
   - Select the **Setup Menu** icon to open the **Setup & Settings** menu.

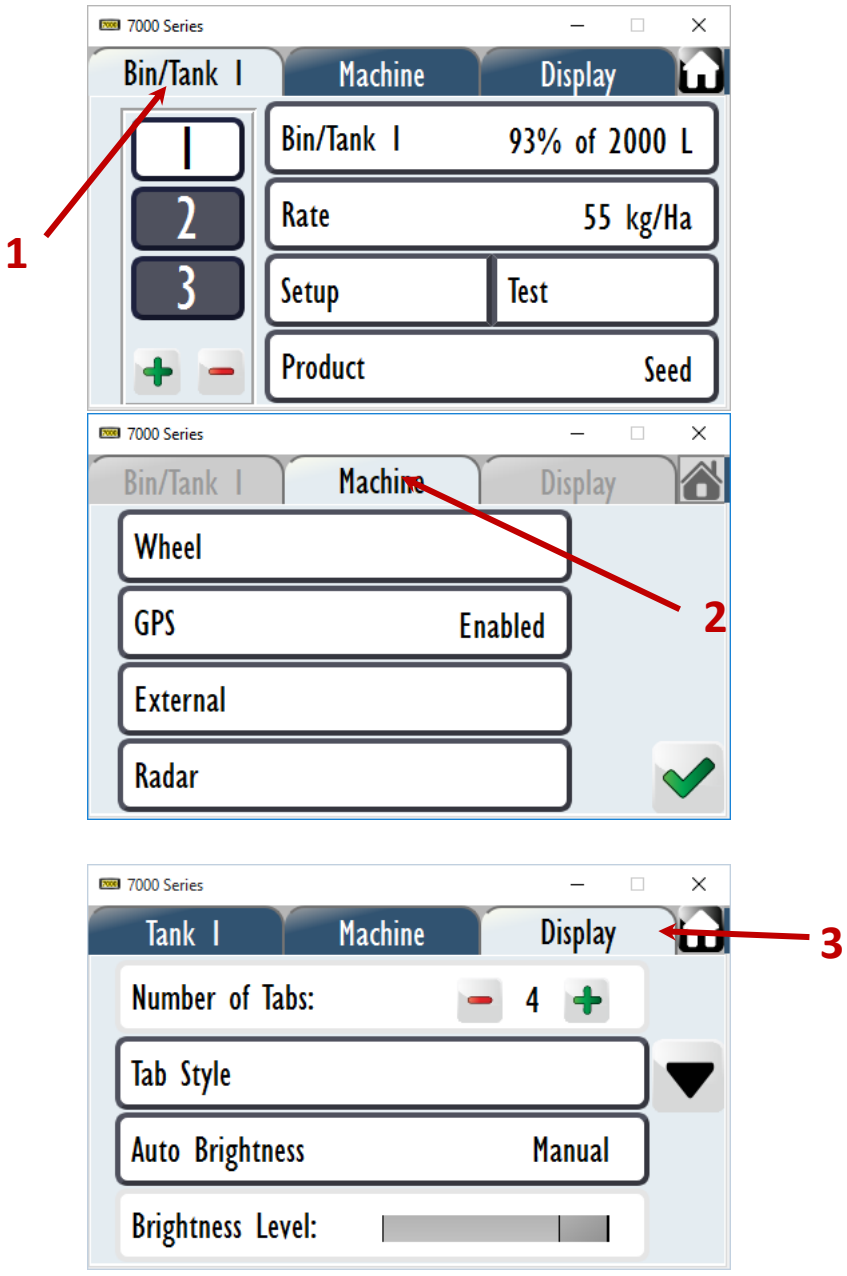
2. **Jobs Menu**
   - Select the **Jobs Menu** icon to open the **Jobs** menu.

3. **Alarms Menu**
   - Select the **Alarms Menu** icon to open the **Alarms** menu.

4. **Maintenance Menu**
   - Select the **Maintenance Menu** icon to open the **Maintenance** menu.

DEVICE MENU OVERVIEW

Setup (1) - Overview

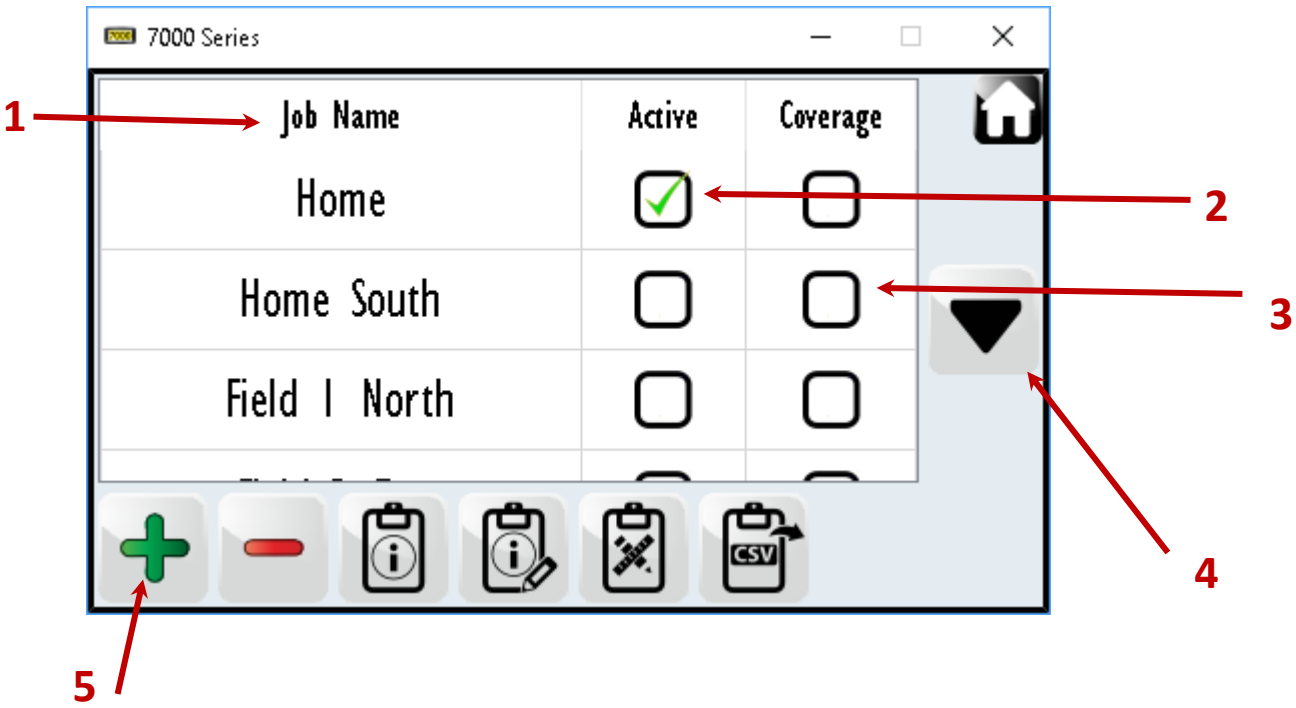


1. **Bin/Tank Tab**
    a. This tab contains settings for the Bin/Tank, any products associated with the tank and enables product calibration. This also defines the number of tanks the 7500 is controlling.

2. **Machine Tab**
    a. This tab contains settings for implement width, drive control type, speed input, pressure, fan, depth, wireless (under development), Mapping, Blockage (under development) UniPOD setup and CANbus status.

3. **Display Tab**
    a. This tab contains the setting for the number of **Front Screen** tabs, how each **Front Screen**
    tab is set up, the brightness of the display, units of measure & enable/disable day/night mode.

Jobs (2) - Overview



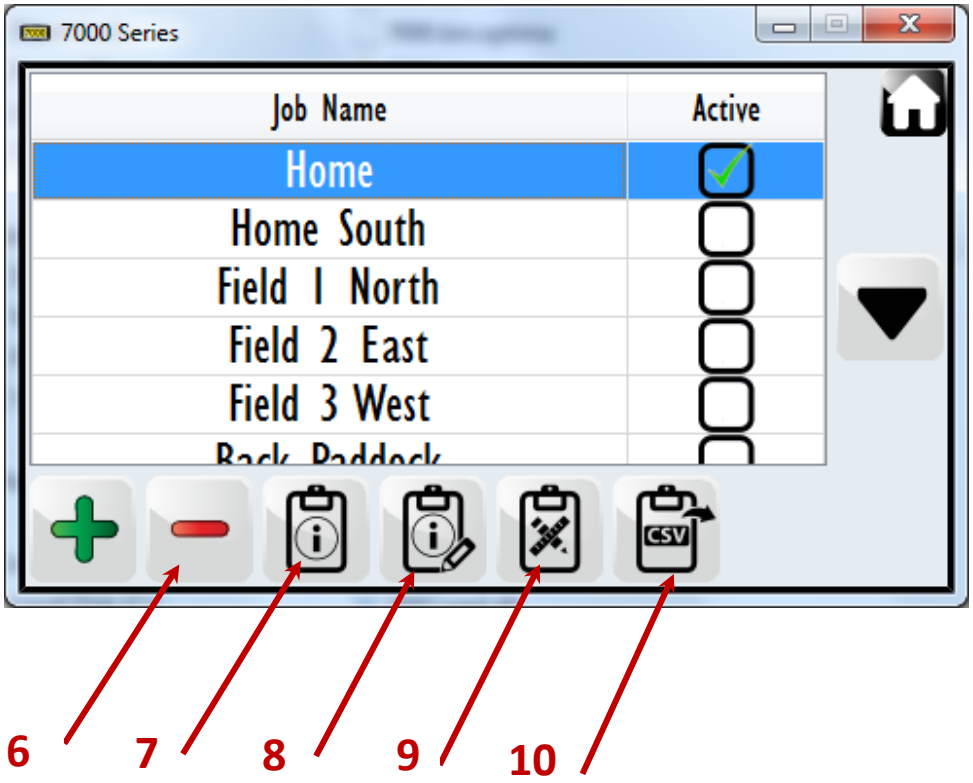
1. **Job Names**
    a. The name of each created Job is displayed in the table.
    b. Select a Job to view it or make it active (Green Tick).

2. **Job Active/ Inactive**
    a. Select (tick) this checkbox to make the job active or inactive. A tick in the box indicates the Job is active and recording data. This also enables data to be displayed on the Front Screen tiles.
    WARNING: Inactive Jobs do not record any data & will not display correctly on a Front Screen Tile.

3. **Coverage**
    a. Select (tick) this checkbox to enable coverage recording. This feature only works when a GPS is connected to the serial port of the 7000 terminal. A widget can be setup on Tab or Tile. By default, the 7500 will display the MAP widget on TAB 3. Only one active job & coverage can be displayed at any time.

4. **Scroll Up/ Down buttons**
    a. If more than 5 Jobs are listed in the table then the Up/ Down buttons will enable scrolling through the table to display all Jobs.

5. **Create new Job**
    a. Select this button to create a new Job. The user will be able to choose a name for the Job or may choose to use the default one.



6. **Remove Job**
   a. Select this button to remove the currently selected Job.
   WARNING: This will remove all information saved in the selected Job.
   b. The selected Job is the row highlighted in blue in the Job list.

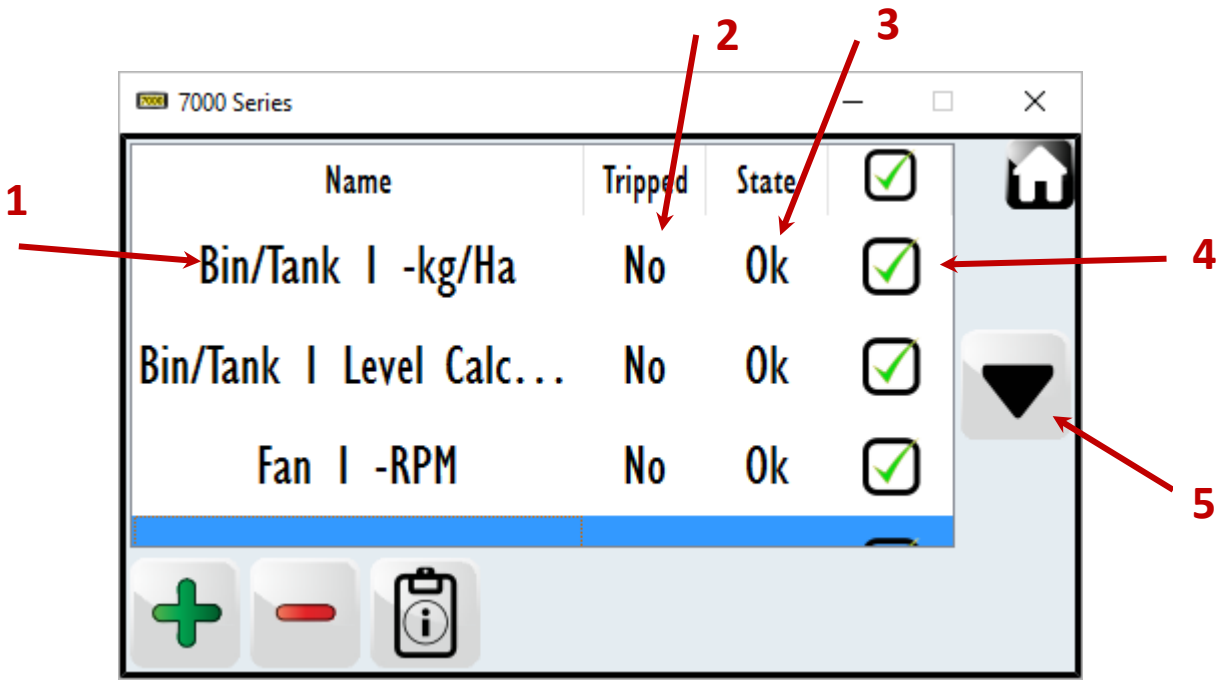
7. **Show Job Details**
   a. Display details of the selected Job. This include total and applied distance, time and area of the Job and applied products.
   b. The selected Job is the row highlighted in blue in the Job list.

8. **Edit Job Name**
   a. Select this button to edit the name of the selected Job.
   b. The selected Job is the row highlighted in blue in the Job list.

9. **Edit Job Units**
   a. Select this button to open a menu allowing the user to change in which units Job details are displayed.

10. **Export to CSV**
    a. Allows the operator to export the selected Jobs via CSV (text) onto a USB memory stick.

Alarms (3) - Overview



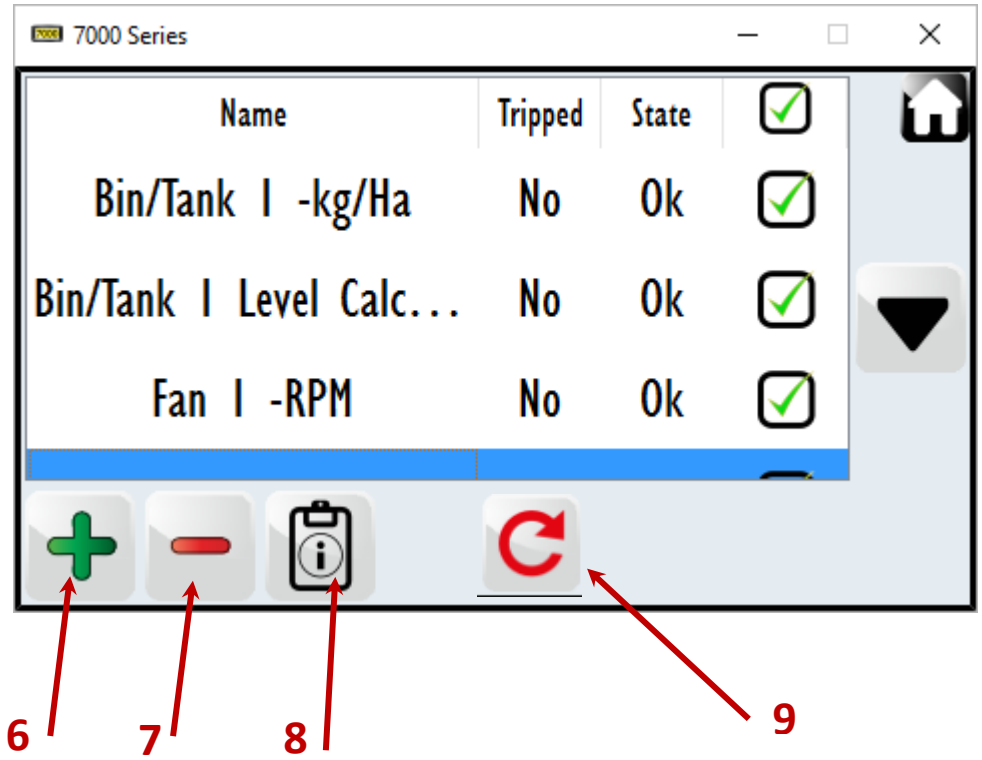
1. **Alarm Title**
    a. Title of the Alarm, which indicates what the alarm is monitoring.

2. **Alarm Tripped Status**
    a. Indicates whether the Alarm has been tripped.
    b. An alarm is 'tripped' if it has gone into the Alarm state and has not been reset yet.

3. **Alarm State Status**
    a. Indicates whether the Alarm is in **Alarm** or **OK** state.
    b. An Alarm is in the **Alarm** state when it has exceeded a given limit set for the Alarm, e.g. speed going over a maximum speed or tank level going below a minimum level.

4. **Alarm Active/ Inactive**
    a. Select this checkbox to activate or deactivate the Alarm.
    WARNING: Inactive Alarms will not indicate when their set limits have been exceeded.
    b. A tick in the box indicates the Alarm is active.

5. **Scroll Up/ Down buttons**
    NOTE: These buttons will be visible if multiple Alarms exist and cannot be displayed on one screen.
    a. If more than 5 Alarms are listed in the table then the Up/ Down buttons will allow the user to scroll through the table to display all Alarms.

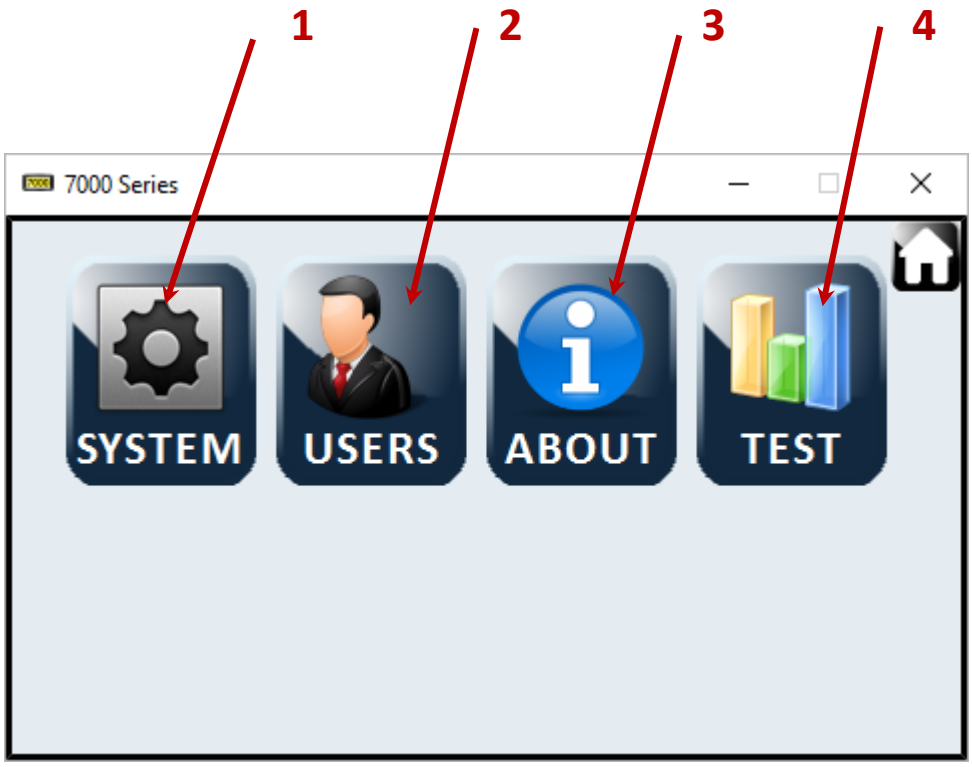


6. **Add Alarm**
    a. Create a new Alarm and set up its operating characteristics.

7. **Remove Alarm**
    a. Removes the currently selected Alarm.
    b. The selected Alarm is the row highlighted in blue in the Alarms list.

8. **Edit Alarm**
    a. Edit the operating characteristics of the currently selected Alarm.
    b. The selected Alarm is the row highlighted in blue in the Alarm list.

9. **Reset Alarm Button**
    a. This button resets a tripped Alarm.
    b. If an Alarm is tripped and still audible (buzzer still sounding) then the reset button will turn off the sound.
    c. If an Alarm is tripped and the state is **OK** then the reset button will reset the Alarm back to its normal state, not its **Tripped** state, and turn off other Alarm indicators.
    d. If an Alarm is tripped and the state is in **Alarm,** then the reset button will NOT reset the Alarm. **NOTE:** Making the Alarm inactive will turn off Alarm indicators, the Alarm will no longer be monitored when **Inactive** though.



1. **System**
    - Software updates, screen calibration, system reset & backup, setting the Date/ Time, language selection & model swap.

2. **Users**
    - Allows for lockout facility if the multiple users option is activated.
        i. We recommend not altering these settings unless absolutely necessary.

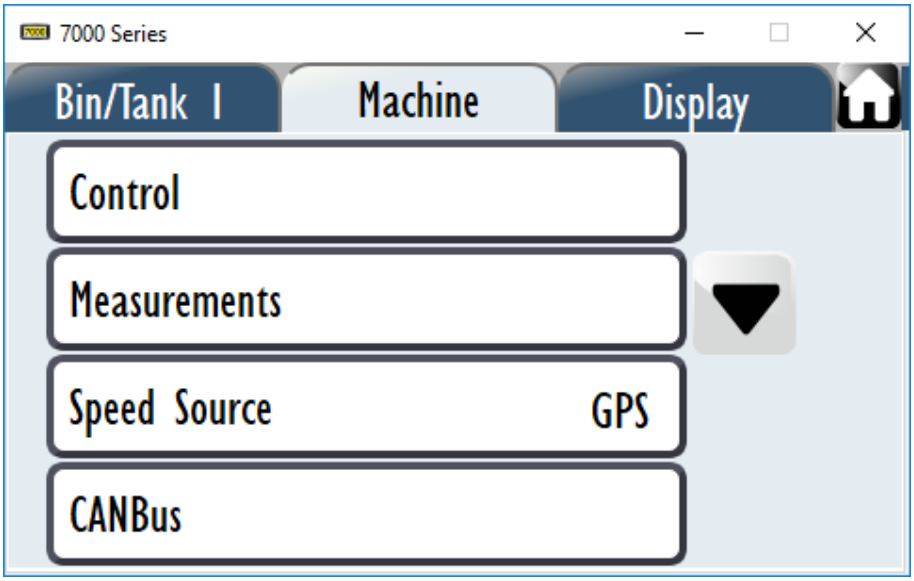
3. **About**
    - Lists the details of the current 7000 series device including model, version number, site ID, IP address status, disk space & hardware BSP version.
        i. This screen also allows a method to enter or update the unlock code

4. **Test**
    - Used for diagnostic purposes only.
        i. Used in conjunction with a Smart AG Systems technician

THIS COMPLETES THE DEVICE OVERVIEW

MACHINE SETUP

The **Machine** tab allows setup of the master control features on the 7500 used for seeder operation.



- **Control (1)**
  - A. Control Speeds (Minimum, Slow Hold, Prime)
  - B. Auxiliary Setup (Bin Level, Feedback sensor)
    NOTE: Will only display when UniPOD is attached.
  - C. Pressure Sensor (x2) (Smart AG Systems Part# AA-119-L or User Defined/Custom)
  - D. Fan Setup (x2) (Smart AG Systems Part# AA-2010P or User Defined/Custom)
  - E. Depth Sensor (Smart AG Systems Part# AA-430 or User Defined/Custom)
  - F. Tramline Setup (Not Used – Custom Application UK)
  - G. Advanced Setup (Smart AG Systems Use ONLY)

- **Measurements (2)**
  - A. Use Section Control Set up/enable single section/implement width
  - B. Set Section Width/s Set up individual widths (Under development for 7500)

- **Speed-Source (3)**
  - A. Wheel Set up/ calibrate or Set to Primary
  - B. GPS Enable/ view NMEA strings or Set to Primary
  - C. External TracMap/Trimble (TUVR)/Vinterman
    - Serial Input Set up as task controller or GPS Input
  - D. Radar Setup/ enable/ calibrate

- **CANbus (4)**
  - A. UniPODs
    - Configure UniPOD's Confirm & configure connection to UniPOD
    - UniPOD Status Check supply voltage & status to UniPOD
  - B. Load Cells
    - Configure Load Cells & check input voltages & readings

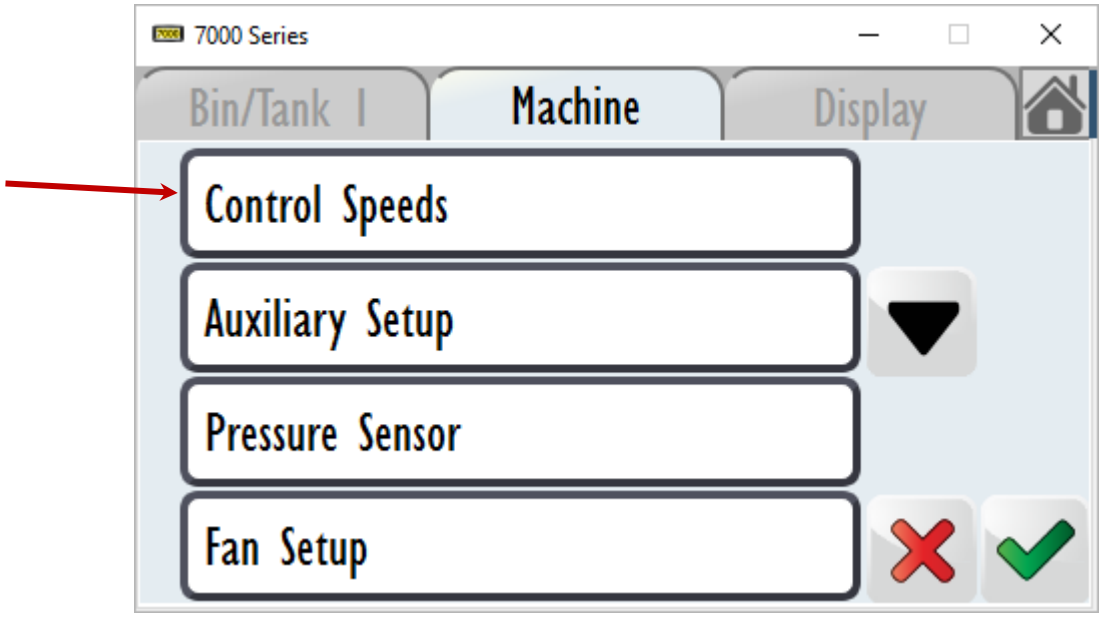
C. Switch Box — Confirm connection to Smart Switch Box
D. Run/Hold Switch — Confirm Run/ Hold remote switch operation

- **Mapping**
  This is where you import your VRA maps and assign a bin number to the product

- **Blockage**
  This tile allows is where you set up your blockage monitor and adjust the sensitivity

Control (1)

Control speeds, allows the user to adjust minimum start speeds, slow hold and prime functions of the seeder.

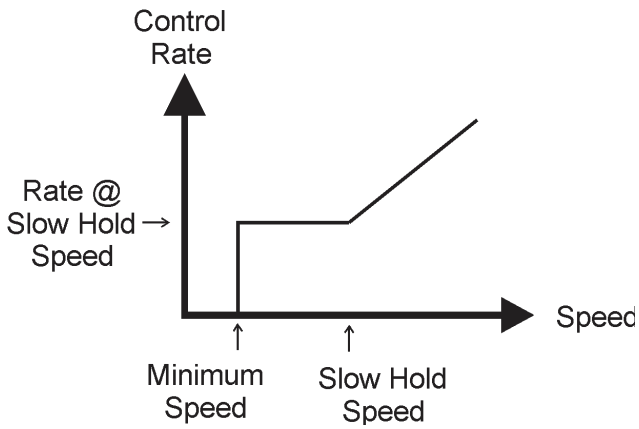


Control Speeds (1A)

1. **Minimum Speed**
   - If the implement drops below this speed, then the seeding drives will shut off.

2. **Slow Hold Speed**

- The **Slow Hold Speed** function is used to avoid loss of seeding coverage caused by loss of consistent product flow through the metering system when travelling too slowly.
- If the implement is travelling below this speed (but above the minimum speed) then metering system is regulated as if the implement were travelling at the **Slow Hold Speed**.
- **NOTE: Slow Hold** is an optional function that can be set to operate at a minimum speed required to give a consistent flow of product through the metering system for a given target rate (speed-based).



To calibrate speed-based **Slow Hold**:

1. Exit to the **Front Screen** and start seeding in AUTO mode at normal speed, then slow down until the metering drive almost stops.
2. Take note of the ground speed when this happens and use this point for **Slow Hold Speed** calibration.
3. Navigate back to this menu and highlight **Slow Hold Speed**.
4. Adjust to set the desired hold speed (km/h).

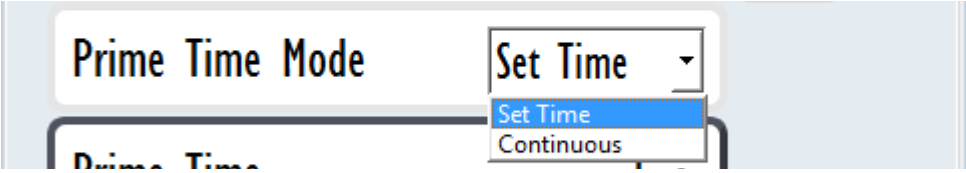
Operating with Slow Hold active will mean the product is being over applied and may cause double sowing!

Prime Mode operation explanation

The **Prime Mode** operation turns on the Seeder metering system before speed is detected from the speed sensors. This allows product to begin metering before moving off preventing

any missed areas due to a metering lag. The product will be regulated as if the implement was travelling at the **Prime Speed**. If the implement exceeds the **Prime Speed** or the **Prime Time** then the product will be regulated normally.

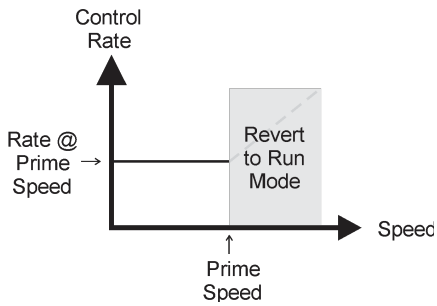
1. **Enable Prime**
    a. If **Prime Mode** is enabled, the metering control will enter Prime Mode instead of Run Mode.



2. **Prime Time Mode**
    a. **Set Time**: When **Prime** is enabled and **Prime Time** set, after X seconds the metering control will revert to Run Mode.
    b. **Continuous**: The unit will remain in Prime Mode indefinitely. **NOTE:** This should **NOT** be used in standard operation but it is useful for "stand still" testing and demonstration.

3. **Prime Time**
    a. If **Prime Mode** is entered, after the selected number of seconds metering control will revert to Run Mode.

4. **Prime Speed**
    a. When in **Prime Mode**, the metering control is regulated as if the implement was travelling at the **Prime Speed**.
    b. If the implement exceeds the **Prime Speed**, metering control will revert to Run Mode.



Auxiliary Setup / Dump Valve (1B)

By default, the 7500 will select the output/control configuration depending on the UniPOD purchased.

Auxiliary Setup allows the user to customise which input goes to each sensor.

- Master Clutch
  - Clutch #
- Master Bin Level
  - Level Input #
- Master Dump (Liquid)
  - Dump Valve #

When 1x UniPOD is installed only 3 free AUX when using a VRC-3 and 4 free Aux with VRC-2

Input #	Application
Auxiliary # 1	Select Option
Auxiliary # 2	Select Option
Auxiliary # 3	Select Option
Auxiliary # 4	Select Option
Auxiliary # 5	Select Option
Auxiliary # 6	Select Option

When 2x UniPOD's is installed

Input #	Application
Auxiliary # 7	Select Option
Auxiliary # 8	Select Option
Auxiliary # 9	Select Option
Auxiliary # 10	Select Option
Auxiliary # 11	Select Option
Auxiliary # 12	Select Option

To change the values:

1. Select the Auxiliary number that you want to change.
2. A selection of available options will be displayed.
3. Select the valve type required.
4. Select the green **Tick** button to save changes.

NOTES:

- Please note UniPODs & harness's come in different configurations.

- If you are unsure of Auxiliary setup, please contact the Smart AG Systems service department or your OEM partner.

Pressure Sensor (1C)

(Smart AG Systems part #: AA-119L Pressure Sensor 0-20kpa)

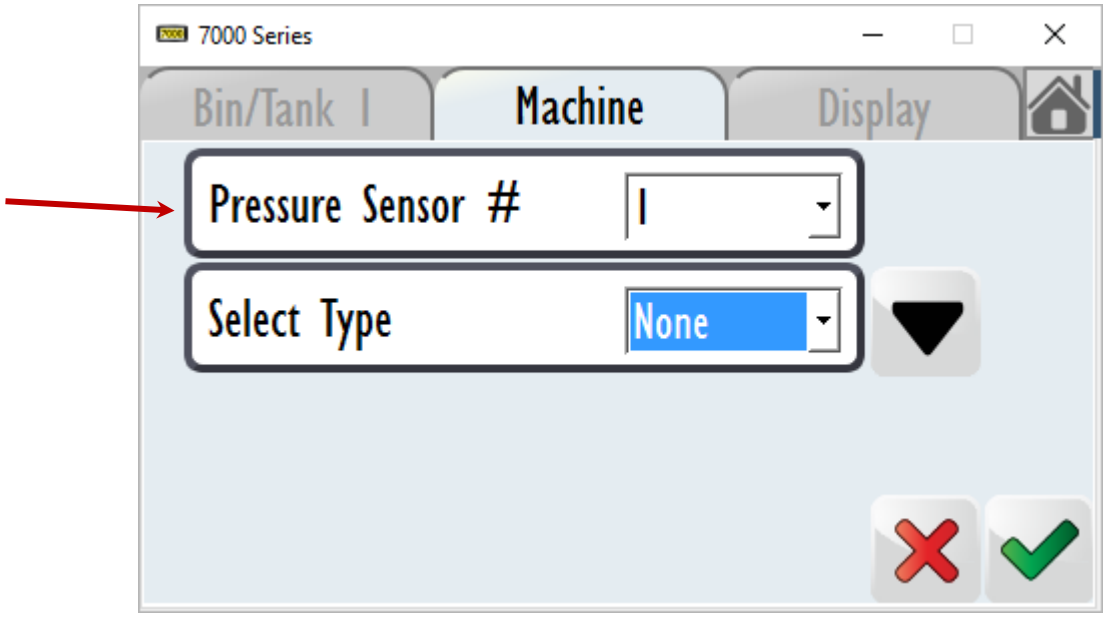
The 7500 has the ability to monitor 2 pressure sensors when 2 bin/tanks & 2 UniPOD's are connected.

Primary air pressure is influenced by many factors and can be used as an indication of changed operating circumstances that may point to a problem.

When the airseeder is operating outside the set high/low alarm points, an audible alarm and message can be displayed.

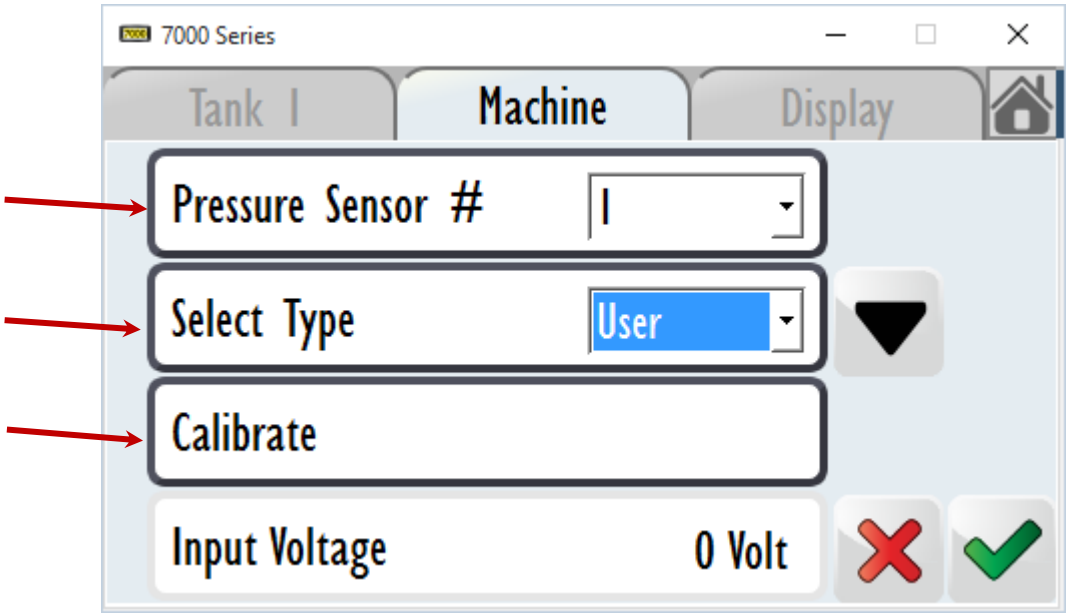
By selecting Pressure sensor #1 & Type as AA-119-L predefined values are used and no further setup is required.

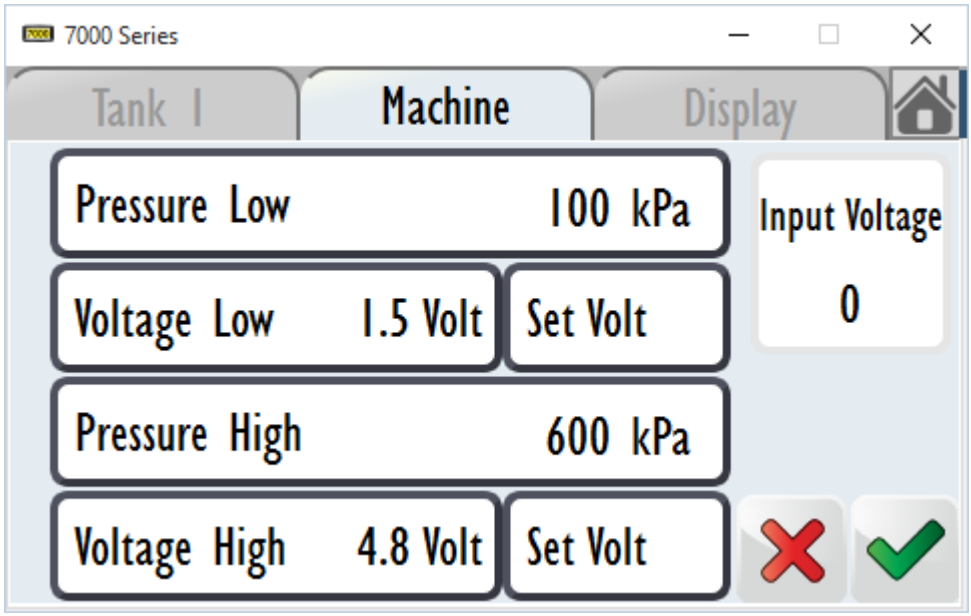
If you wish to use a different style sensor (BYO), setup can be achieved by following the instructions on the next page.



BYO Pressure sensor or set manual user defined values.

As shown below, select the pressure sensor number you wish to calibrate. **Select Type as USER** and then **CALIBRATE.** Repeat procedure if two pressure sensors are installed.





Pressure Low: Input the lowest pressure the unit will need to display.

Voltage Low: You can either:

1. Manually add the **Voltage Low** (as per manufacture specifications), or
2. Adjust your pressure manually to the low point and then select **SET VOLT.** This will take the value from the LIVE input voltage and automatically insert.

Pressure High: Input the highest pressure the unit will need to display.

Voltage High: You can either:

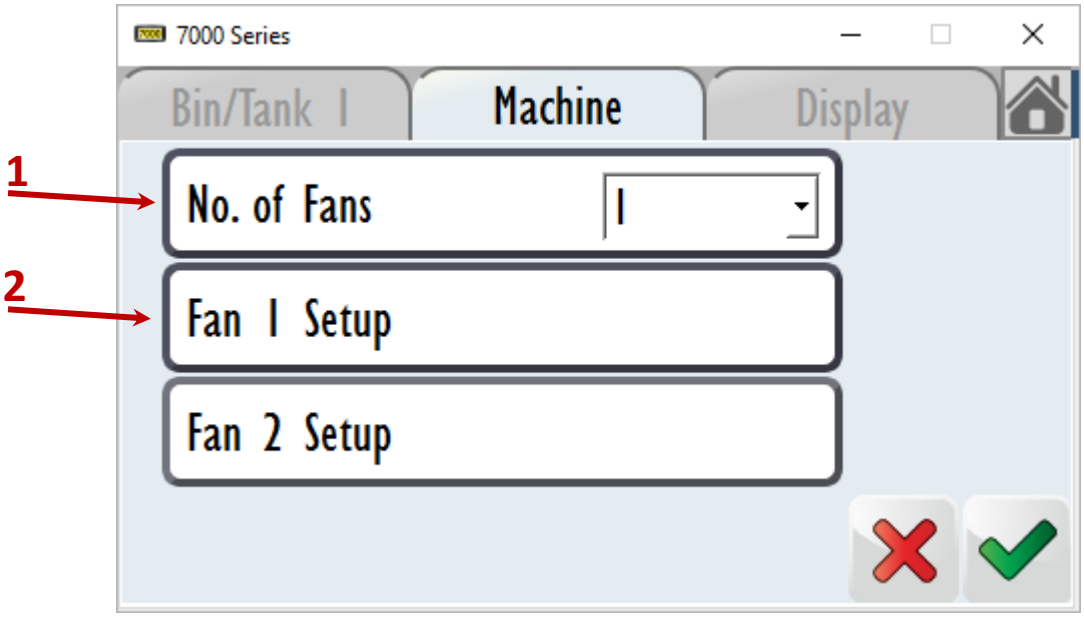
1. Manually add the **Voltage High** (as per manufacture specifications), or
2. Adjust your pressure manually to the High point and select **SET VOLT.** This will take the value from the input voltage and automatically insert.

Fan Setup (1D)

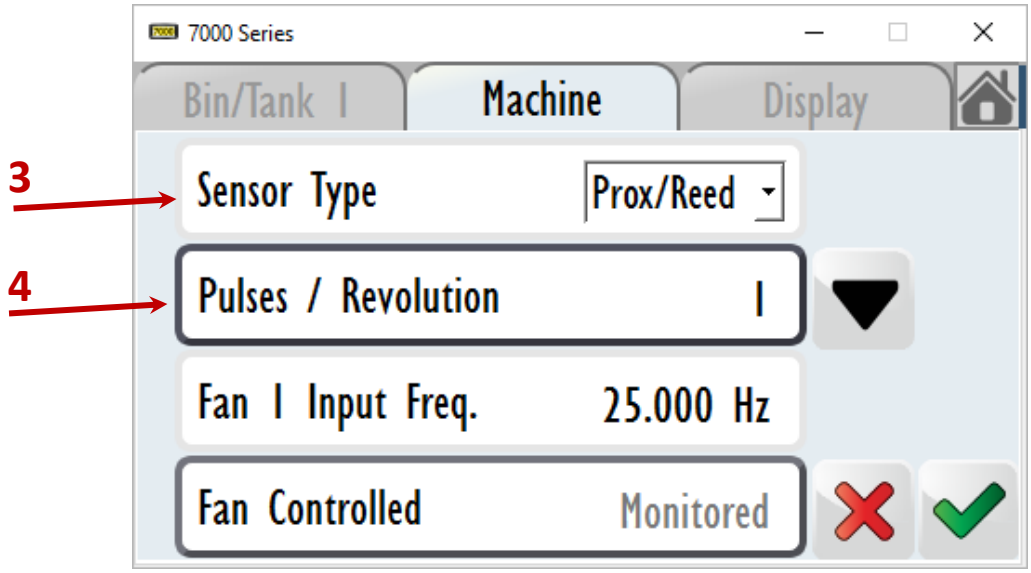
(Smart AG Systems part #: AA-2010P Proximity Switch)

The 7500 has the ability to monitor two RPM inputs. Both of these inputs can be setup as either a fan rpm input or in the case of liquid, a pump rpm input (or simply 2 fan rpm inputs). The fan alarm when setup warns the operator when the fan rpm is outside the low and high set points. The fan can also be displayed on any live tile on the front screen.

NOTE: DC and hydraulic drives will not start metering if either of the two fans are operating below the low critical alarm points.



1. Select the No of Fans to be monitored
2. Select the appropriate Fan number to setup
3. Select **Sensor Type** as **Prox/Reed**
4. Select the number of **Pulse/Revolution** i.e. if there is more than one pickup point
5. Select the **Tick** button when done
    a. Repeat the process if more than 1 Fan is required.

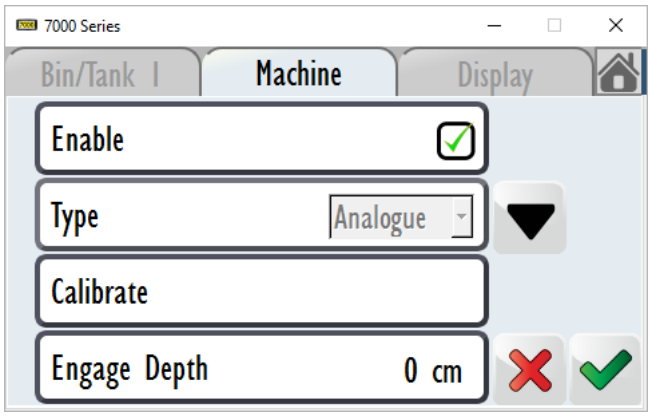


Depth Sensor (1E)

(Smart AG Systems part #: AA-430 Depth Switch or AA-5200 Rotary Sensor / 5v Linear input ONLY)

The 7500 can be setup to provide a visual readout in **CM** of implement ram position using a scale of A:B (where A is full ram extension and B is maximum depth required). The depth **Alarm** can be set to **Critical** using a "HOLD" point, which automatically puts the unit on hold when the implement is raised above this point.

NOTE: The depth sensor must be enabled and alarm points sets for the above feature to work.

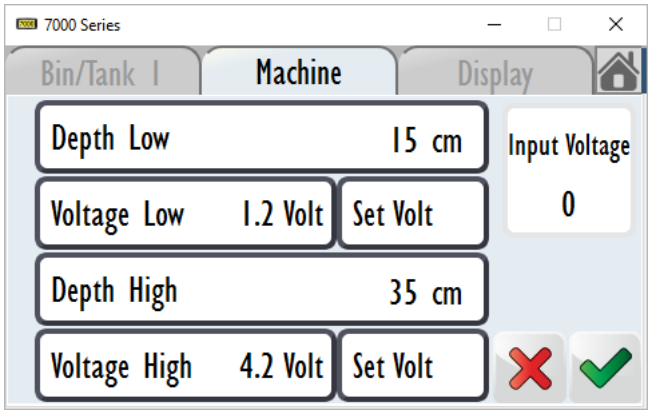


1. Enable the depth sensor by selecting the **Tick** box
2. Press **Calibrate**

When adjusting the implement height, the live **Input Voltage** provides a reference point for setting the required hold point. Test the readout by raising and lowering the implement to ensure the depth sensor is adjusted to provide a sufficient range of operation.

Please note: Depth low is bar down and

3. Using the live **Input Voltage**, adjust the height of the bar to extend from the ground at the required maximum height. Measure the value from ground to seeding boot.
4. Manually enter the values or press the **Set Volt** at the desired depths and set the values in **CM**.
5. Repeat the above process to set the seeding depth and set the



6. Press the **Tick** when done
7. Return to the previous page and set an **Engage Depth** in CM to activate this feature.

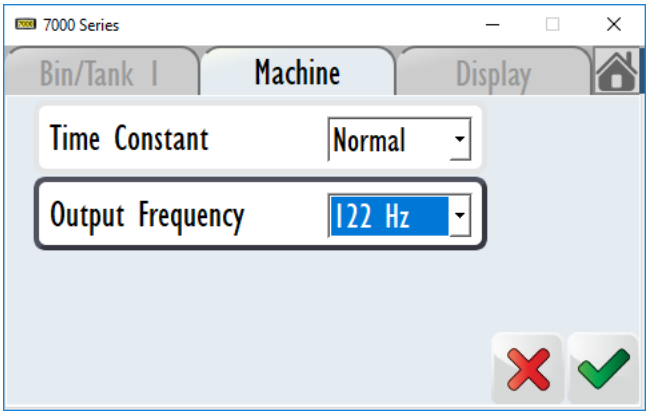
Tramline Setup (1F)

Currently in development. – A supplement guide will be produced when this feature is enabled.

Advanced Setup (1G)

ONLY adjust these settings if advised by a Smart AG Systems technician.

The Time Constant option changes the control method to better suit applications that are less responsive when controlling. Otherwise it is recommended to use the 'Normal' Time Constant.

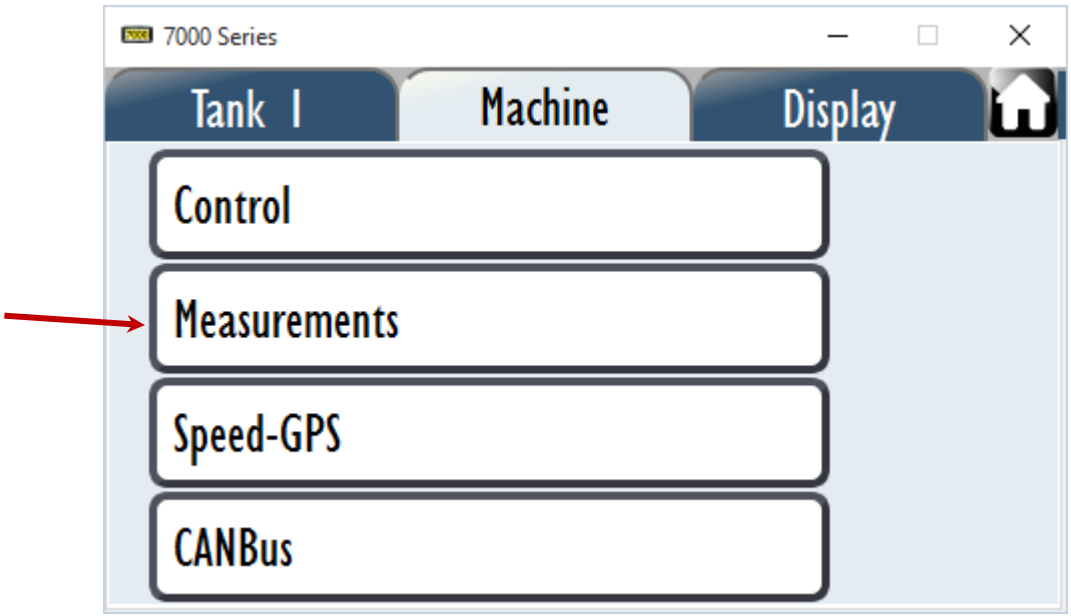


Time Constant:

- Normal: Typical rate control
- Low Speed: Used for rate controlling with less responsive systems
- Output Frequency changing. A Smart AG Systems technician will advise if this function needs

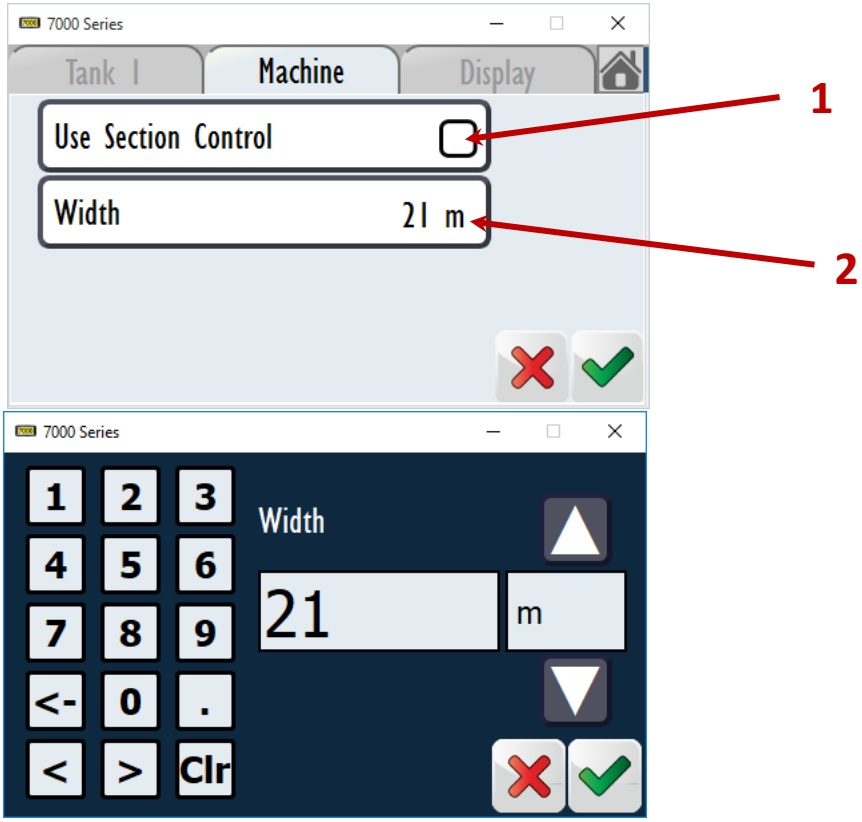
Measurements (2)

For the 7500 to correctly display and control the desired application rate, an implement width needs to be entered.



Section Width (Single)

1. Deselect (untick) the **Use Section Control** checkbox.
   (Not used in the current seeder application)
2. Select the **Width** button.
3. Enter the Value and Unit and then select **Done**.


7000 Series
Tank 1
Machine
Display
Use Section Control
Width
21 m
1
2
7000 Series
1
2
3
4
5
6
7
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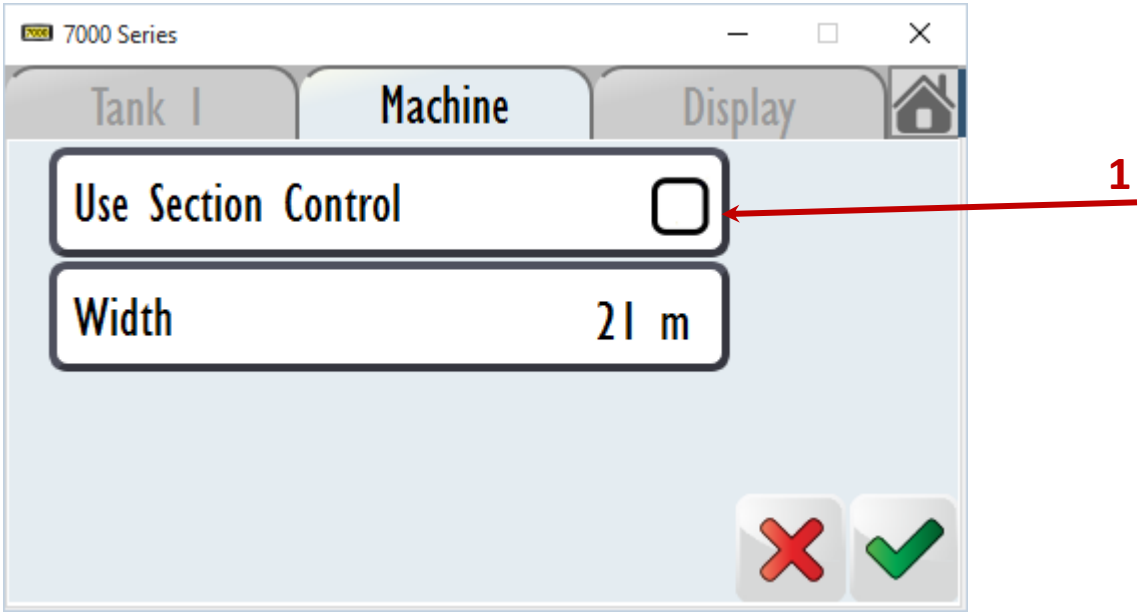
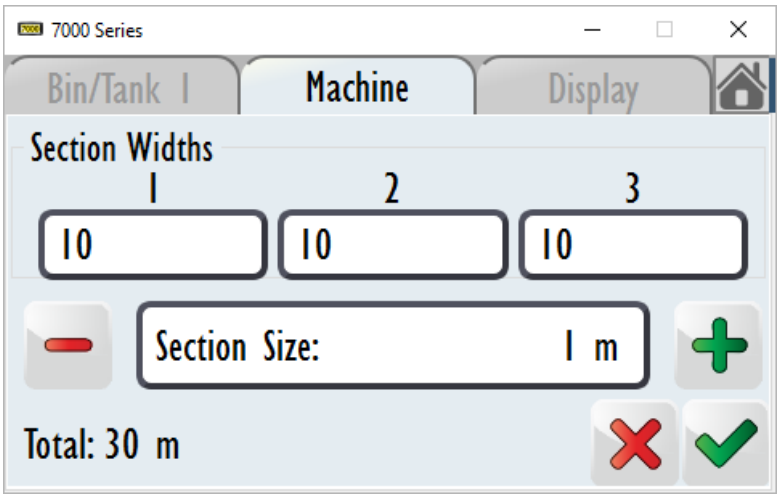
Clr
Width
21
m

NOTE: This feature is still under development & not currently required.
Please use the Section Width SIGNLE method as described previously.



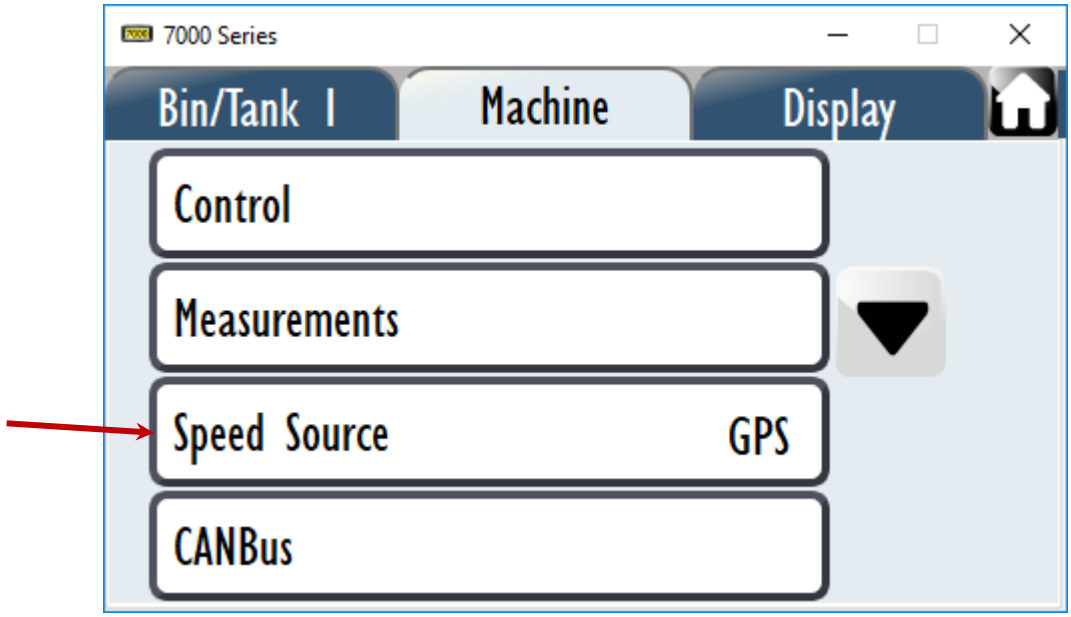
1. Make sure the **Use Section Control** checkbox is ticked.
2. Select the **Set Section Widths** button.
3. Select the **Section Size** button.
4. Enter the Value and Unit for the section widths, and then select **Done**.
5. Select the **+** button to add sections with a width entered in the previous step.
6. Select the **–** button to remove sections.
7. Select individual sections to modify individual section widths.
8. Select the green **Tick** button.



THIS COMPLETES THE MACHINE MEASUREMENTS SETUP

Speed - GPS (3)

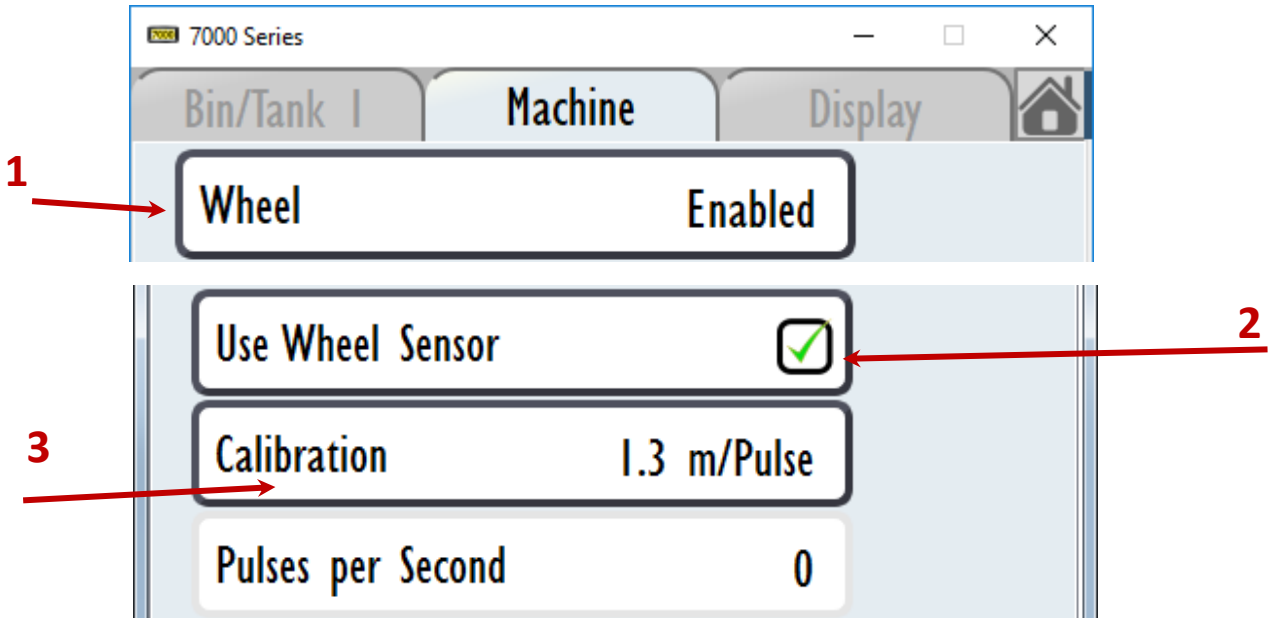
The 7500 has the ability to have GPS Speed input OR a standard magnet/ sensor input for ground speed. Setup options are described below:

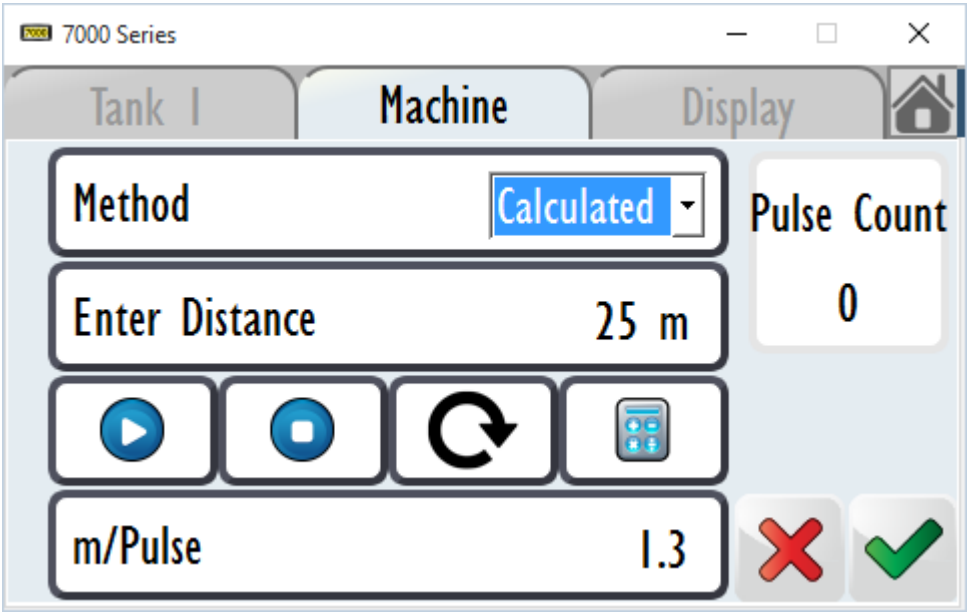


Wheel Sensor

To set up Wheel Sensor (display speed correctly):

1. Navigate to **Wheel Sensor**.
2. Select the **Use Wheel Sensor** checkbox (i.e. Set Primary).
3. Select **Calibration** to go to the **Calibration** screen.





NOTE: This screen is used to re-calibrate your wheel factor if you find your speed is not displaying correctly.

To calibrate the **Wheel Speed** sensor, follow these steps:

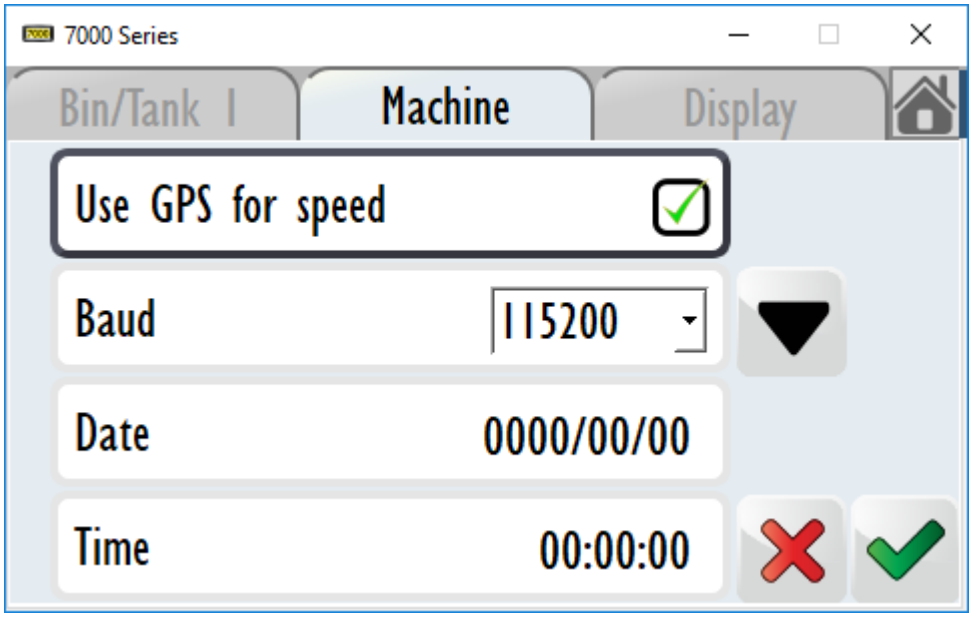
1. Measure out a set distance on the ground for calibration (greater than 20m). Peg both start and end points.
2. Align magnet and sensor by moving forward.
3. Mark a point on the tire that corresponds with the start point.
4. Select the correct calibration.
5. Make sure the **Method** dropdown list has **Calculated** selected.
6. Select the **Enter Distance** button and enter the distance (from step 1) the wheel will travel during the calibration.
7. Select the **Play** button.
8. Drive along the measured distance (from step 1).
9. Stop at the pegged point, lining up the bottom of the tire with the end peg point.
10. Select the **Stop** button.
11. Select the **Calculate** button (the calculator symbol).
12. Select the green **Tick** button and keep selecting it until out of the **Machine** tab.

Alternatively, you can change the **Method** to **MPP** (Meters per pulse) and enter a known factor. To do this:

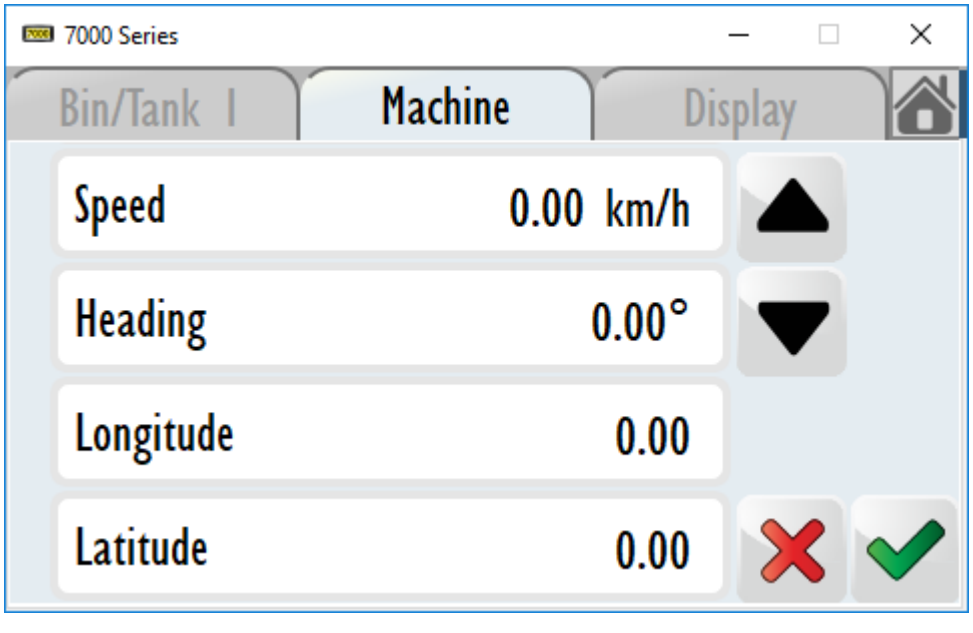
1. Align magnet and sensor by moving forward.
2. Mark a point at the bottom of the tyre and on the ground (normally bottom centre).
3. Drive one full rotation of the wheel and stop when marked point on tyre is centre bottom.
4. Measure between the two points.
5. Insert the measurement on the **m/Pulse** button.

If you prefer to use GPS input for ground speed ensure the previous **SET PRIMARY** against the wheel is **NOT** selected.

When entering this menu and the GPS is connected to the serial port of the AC-7000, cable data should appear in the window below. If not, refer to serial setup on the next page.

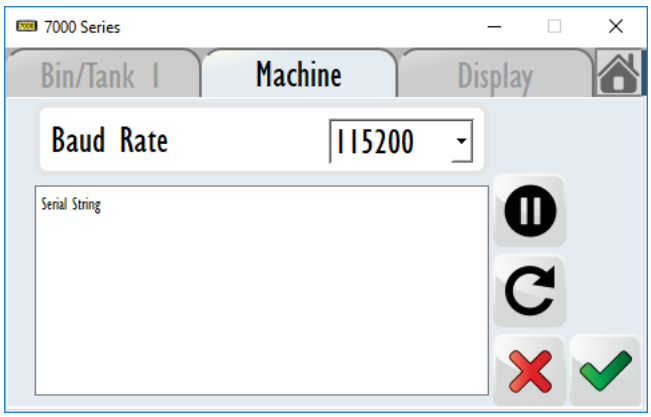


Scroll down to check NMEA messages are coming through.



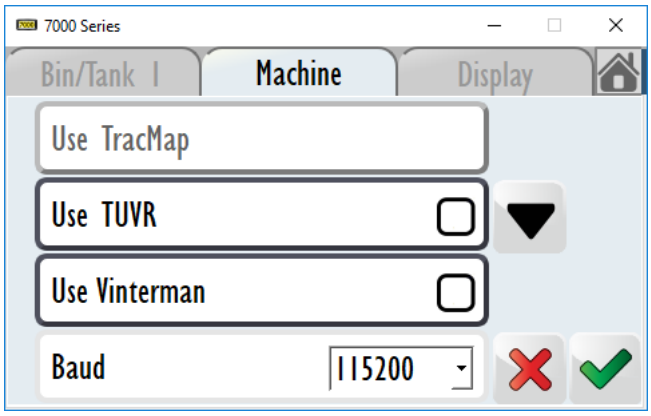
Serial Input

The serial setup menu allows you to view raw GPS data from your receiver. Set the correct Baud rate as specified for your external GPS or guidance system to view this data and ensure correct setup of your GPS.



External (Output)

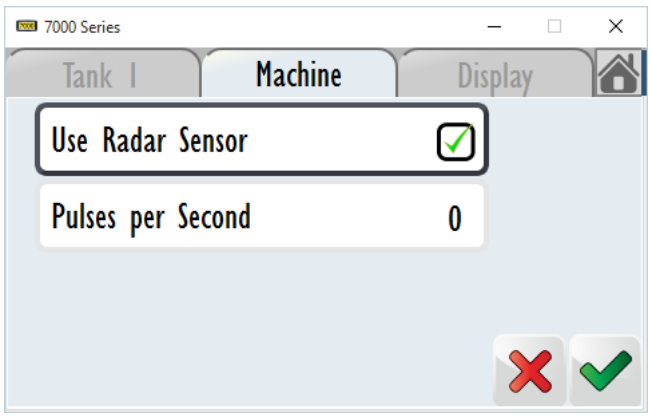
This option can only be used when connected to a TracMap GPS Unit, Trimble TUVR enabled screen or Vinterman controller. Enable one of these options when instructed to.



Please note that a NULL MODEM cable will be required to use these options. The appropriate baud rate also needs to be selected. Refer to the specific install guide.

Radar

This feature is currently under review. If you wish to use the Radar input, please contact Smart AG Systems to discuss your options.

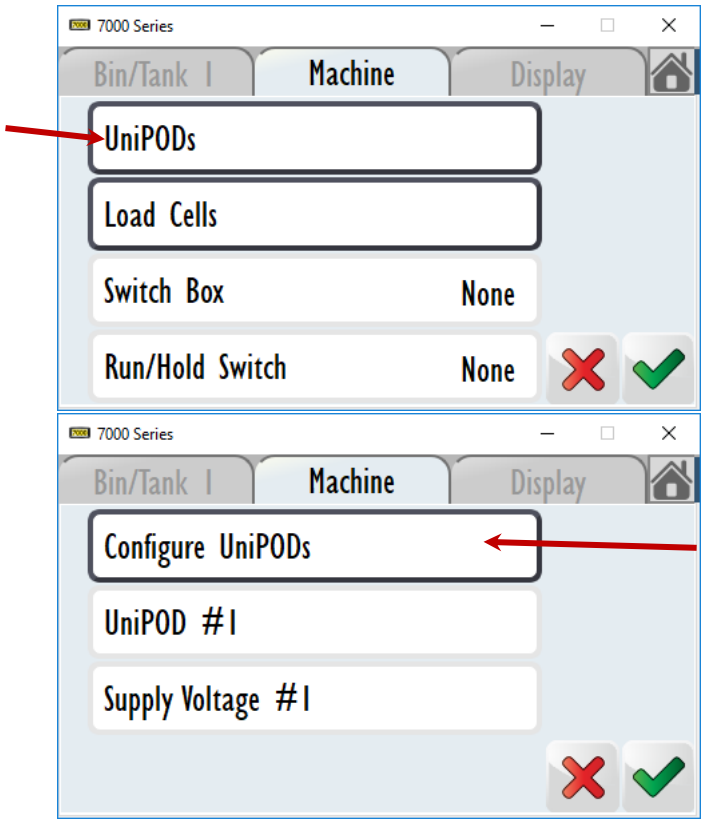


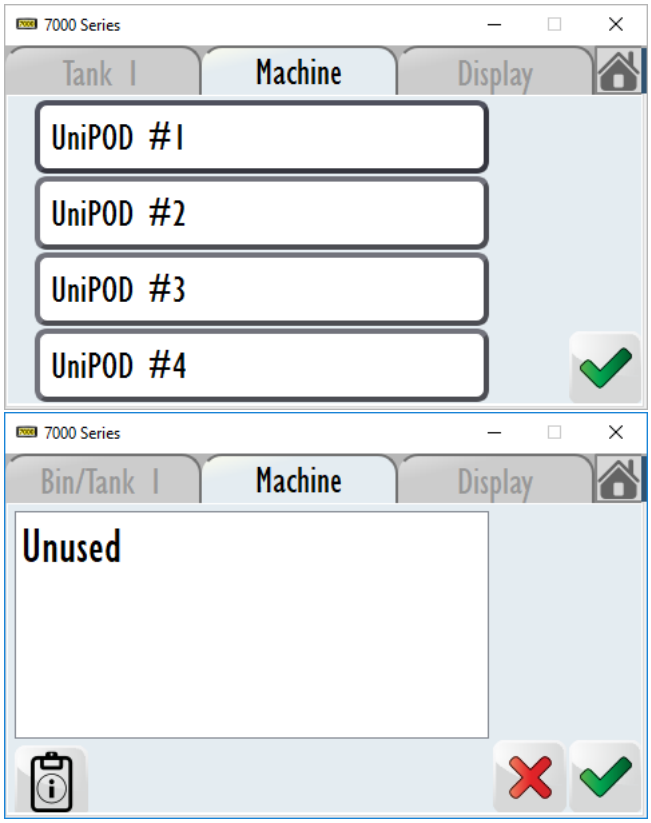
UniPODs - CANbus (4)

The CANbus menu allows you to confirm the connection status and voltage to the UniPOD along with smart switch and remote Run/ Hold switch if attached. If multiple UniPODs are attached to the 7000 system, the order of the pods can be configured here also. The 7000 should automatically detect the UniPOD connected to the 7000. If not, follow the steps below.

Configure UniPODs

NB: This should only be altered if the Auto UniPOD configuration was not successful.





1. Select the **UniPOD's** button.
2. If only one UniPOD is connected this screen will display CAN address and the voltage that the UniPOD is currently receiving.
3. The Configure UniPOD menu will display the unique CAN ID's for each UniPOD connected. If more than one UniPOD is connected, the order in which they are physically connected on the wiring harness must be aligned to how the software has them connected.
4. Select **UniPOD #1.** This will display all the UniPODs the system has been connected to.
5. Select the **CAN address** of the UniPOD connected first on the physical wiring harness
6. Select the green **Tick** button to save changes.

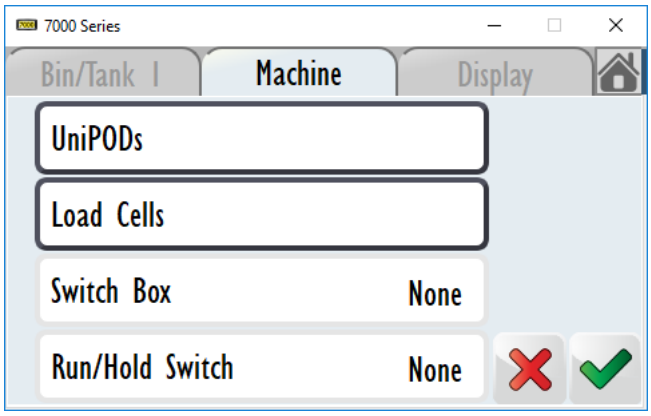
- If more than one UniPOD is connected, repeat the above process.
- Please ensure the lower serial number value is on UniPOD 1.

Load cells

Please refer to the supplemental Load Cell guide. (Currently a GASON Airseeder function only)

Switch Box

If an external switch box is or is not connected on the CANbus this will be indicated as **Connected** or **None**.

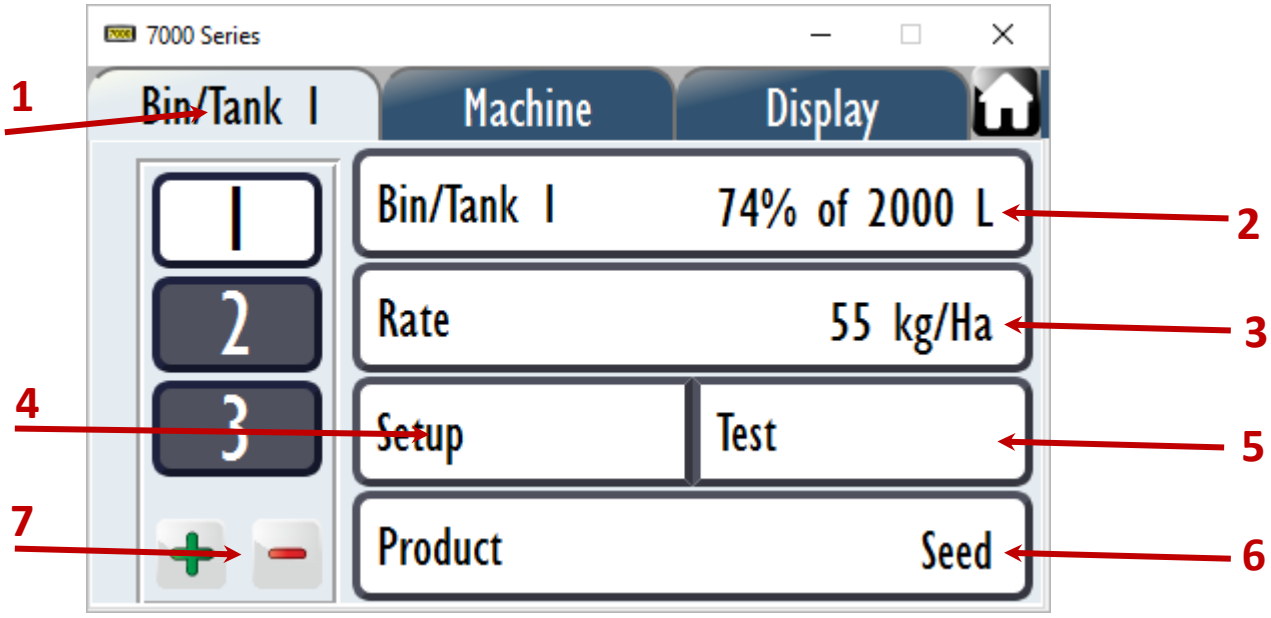


Run/Hold Switch (AC-7003)

If an external Run/Hold is or is not connected on the CANbus this will be indicated as **Connected** or **None**.

When connected, the current state of the switch will also be displayed.

TANK SETUP



1. **Tank Number**
    a. Select to show configuration for each tank (it will highlight WHITE).

2. **Tank X Capacity**
    a. Shows the estimated capacity as a fraction of the total capacity.
    b. Select to configure tank volume and level settings.

3. **Rate**
    a. The application rate being applied.
    b. Select to adjust desired rate and step rate required.

4. **Setup**
    a. Setup the control valve.
    b. Select a pre-defined metering control setup or enter a custom value.
    c. Setup input frequency range.

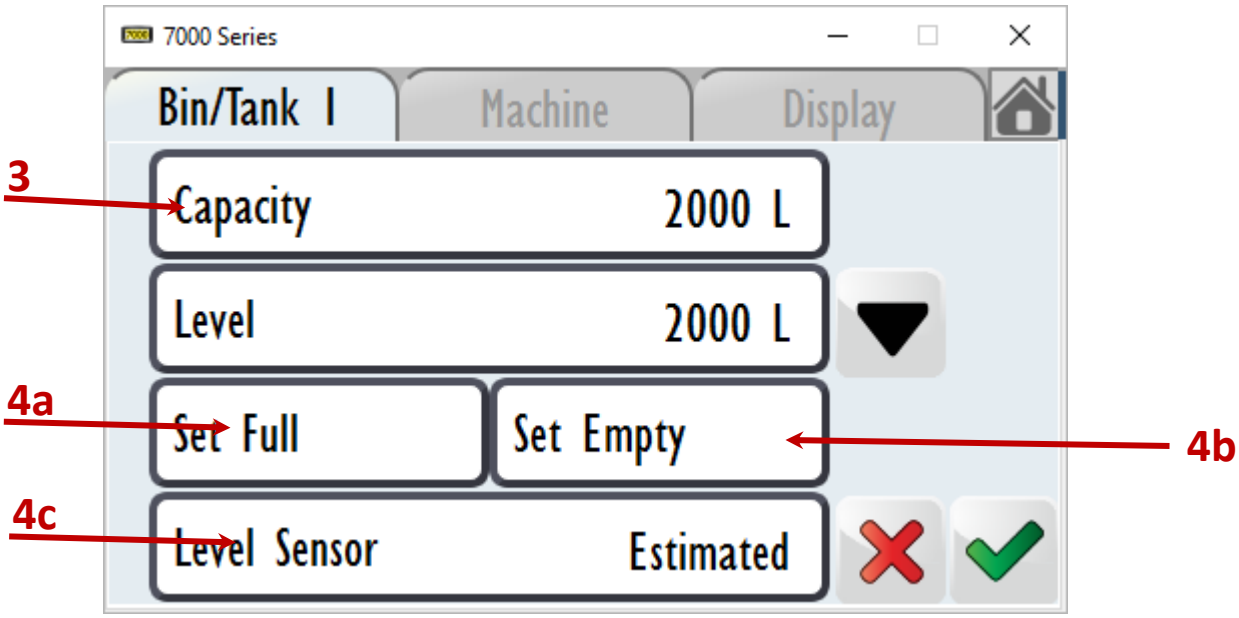
5. **Test**
    a. Select to go to the **Test** menu.

6. **Product (Calibration)**
    a. Shows the product currently calibrated for the highlighted Bin/Tank.
    b. Select to change product and enter calibrations.

7. **Add/Remove Tank**
    a. Use this to add a second tank to your setup. **NOTE:** Please note that your UNIPOD must be programmed for this type of dual rate application.

Capacity (2)

To setup the capacity of a tank, follow these steps:



1. Select a tank in the list on the left to select it. (Previous page)

2. Select the **Tank** button. (Previous page)

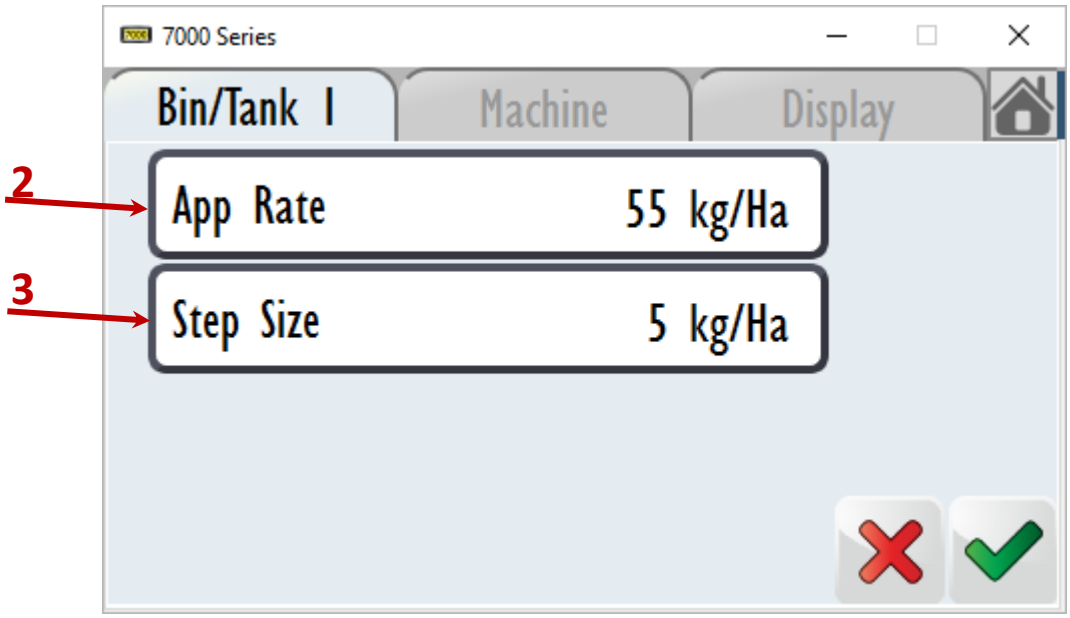
3. Select the **Capacity** button.
    a. Enter the volume of the tank.
    b. Select a unit using the **Up** and **Down** arrows.
    c. Select **Done**.

4. To set the level of the tank, do one of the following:
    a. Select the **Set Full** button to set the tank to 100%.
    b. Select the **Set Empty** button to set the tank to 0%.
    c. Select the **Level Alarm** button to input the tank level as either an estimated (computed) or external (tank level sensor) value.

5. Select the green **Tick** button to save your changes.

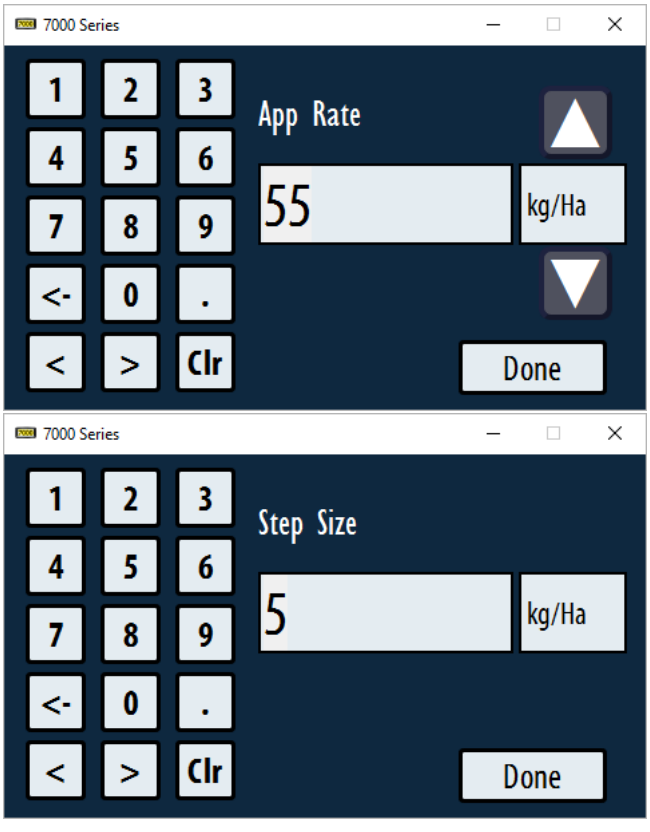
Rate (3)

To setup the desired application rate for a tank & its product, follow these steps:



1. Select the **Rate** button (not shown in the image above).

2. Select the **App Rate** button.
    a. Enter your desired application rate for the tank.
    b. Use the **Up** and **Down** arrows to select the unit.
    c. Select **Done**.

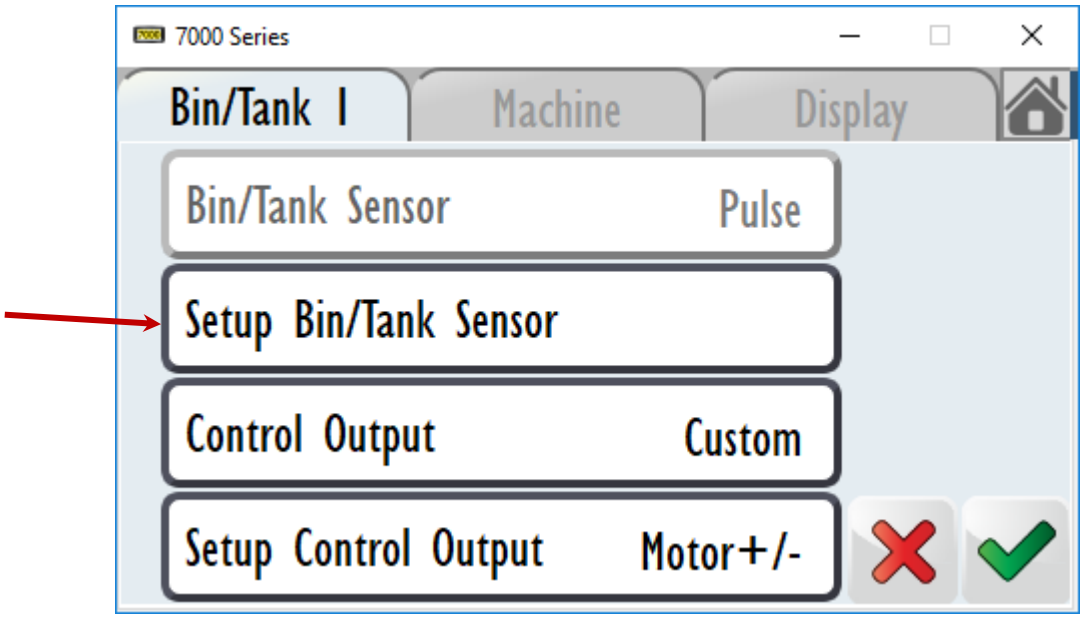


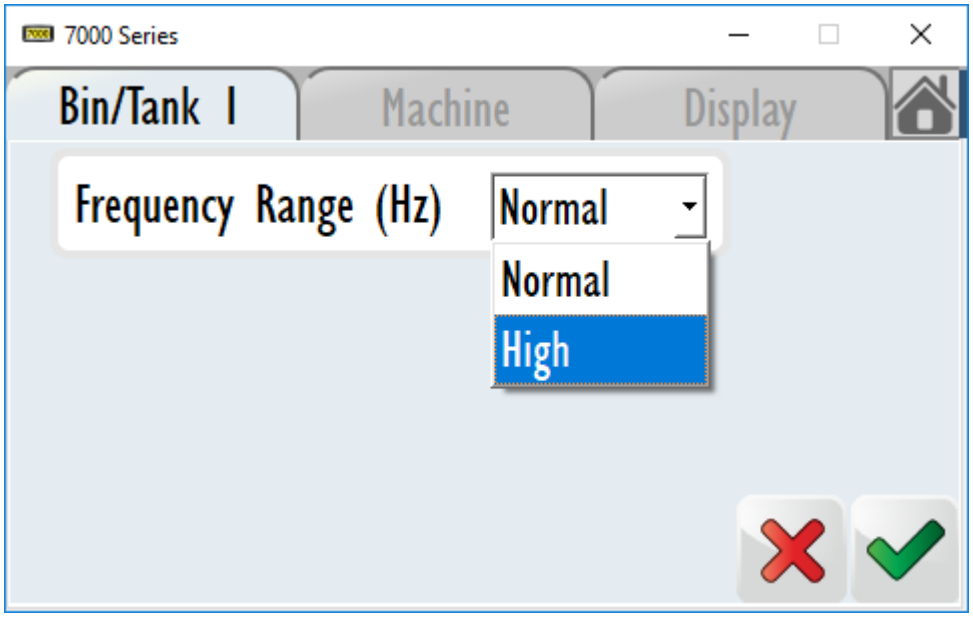
3. Select the **Step Size** button.
    a. Enter your desired application rate step for the tank.
    NOTE: The step size that the application rate will change by when being adjusted from the **Front Screen**.
    b. Select **Done**.

4. Select the green **Tick** button.

Setup (Input frequency) (4)

If your shaft speed sensor (typically an encoder) generates a frequency above 655Hz set the frequency range to High. Otherwise it is recommended to use the 'Normal' frequency range.





Frequency Range (Hz):

- Normal: 0.01 – 655 Hz
- High: 0.1-6553Hz

It is recommended to use 'Normal' unless you specifically require high frequency inputs.

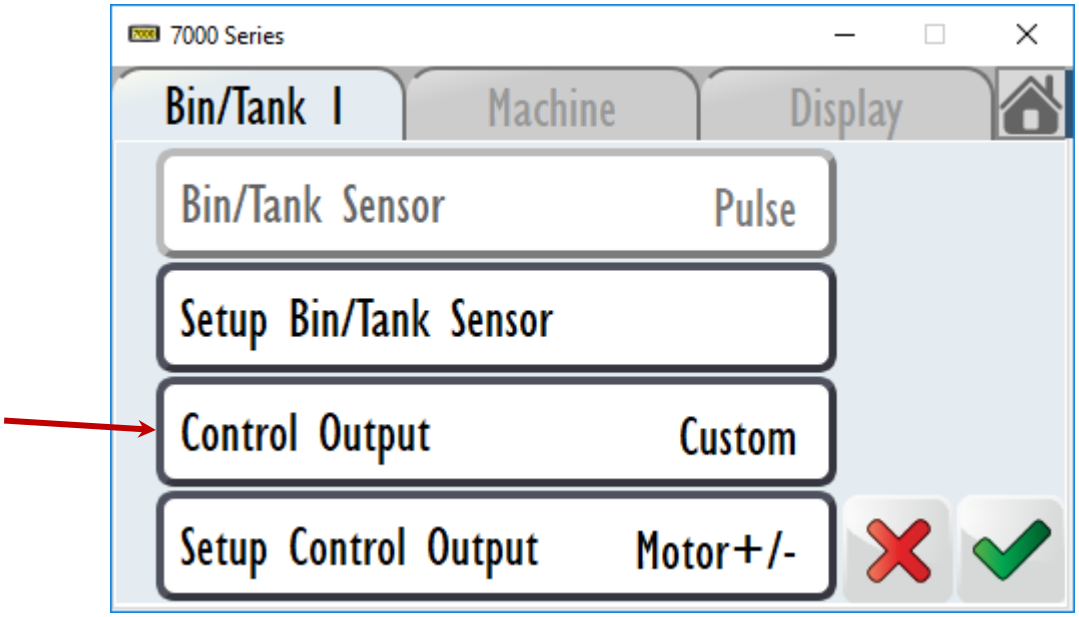
Setup (Metering control) (4)

It's important to set up your metering correctly to maintain regulated application rate while changing speeds.

- By default, the system does not require any user edits for:
    a) Bin/Tank Sensor: Pulse (Default)
    b) Setup Bin/Tank Sensor: Pulse (Default)

Under **Control Output** we have 2 options.

- Braglia (for Liquid fertiliser)
- Custom (This should be used as default)



By selecting **Custom** you have the ability to set your own values as per the manufacturer's & Smart AG Systems recommendations.

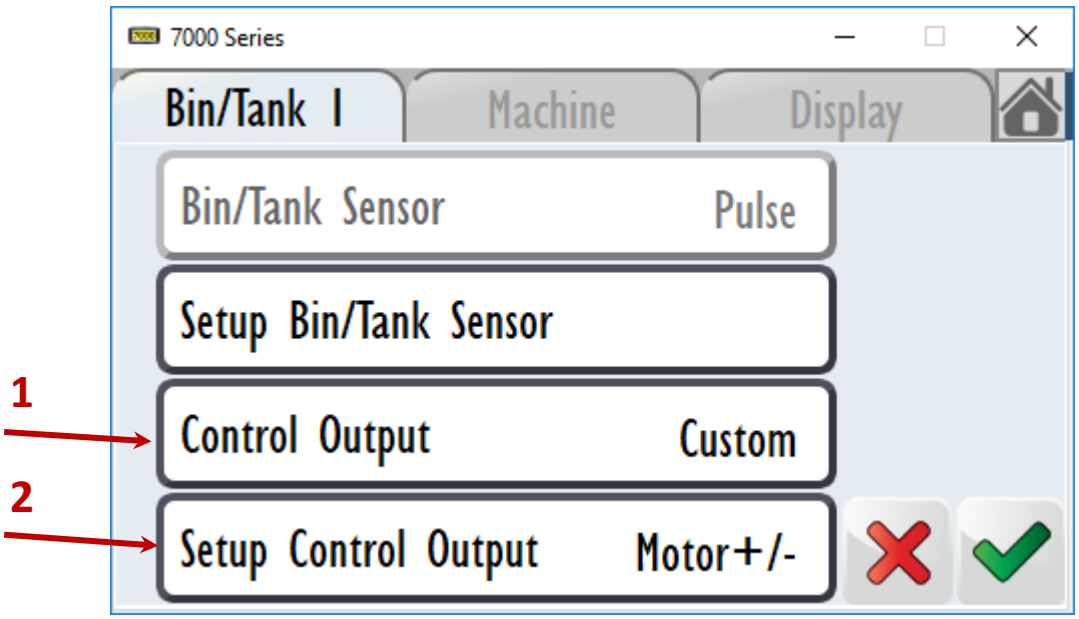
The following control **Type** methods are available when used with an airseeder.

a. Motor +/- (DC Motor/Linear Actuator: i.e**. Horwood Bagshaw, Simplicity**)
b. PWMVolt (Hydraulic Proportional, MFC, Danfoss: i.e. **Gason, Morris**)
c. PMWCurrent: Not Used
d. SauerDanfoss PVG32: (Used on some specific Airseeders, i.e. **Ausplow**. Refer to your Manufacture for more details. If unsure, select **PWMVolt** and calibrate manually)

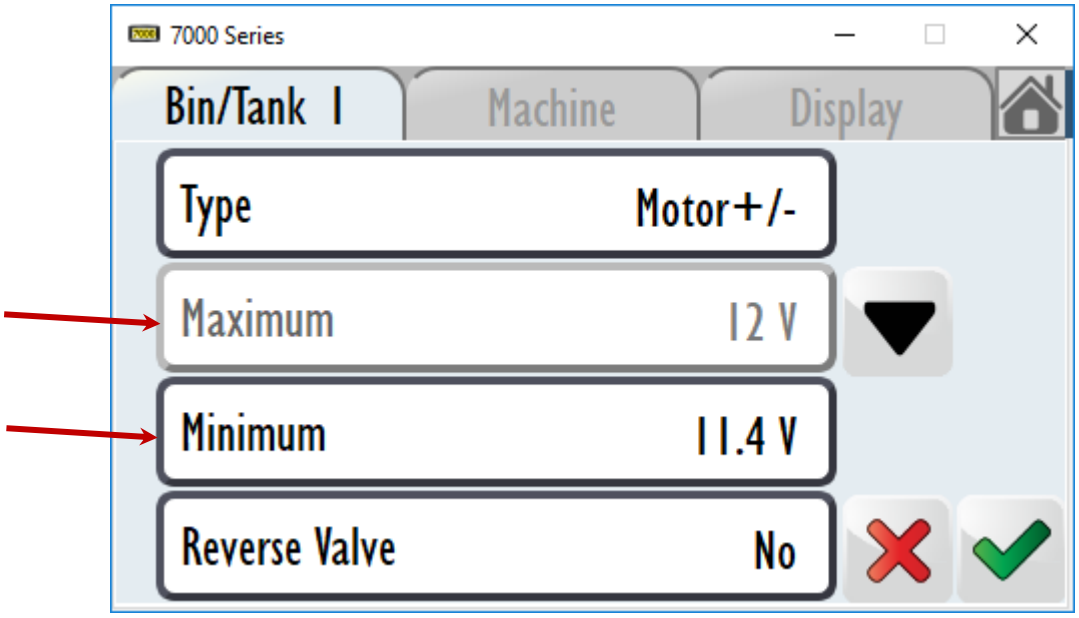
It is recommended that you please contact Smart AG Systems Technical Support for clarification regarding the setup of non-standard control valves.

Setup Control Valve (Motor +/-)

Selecting the **Motor +/-** option will allow for manual calibration of an airseeder setup using a DC motor to drive the metering shaft. This opton can also be used for liquid rate control.



Warning: Changing these values can be detrimental to your valve if not done correctly.
Proceed with caution!



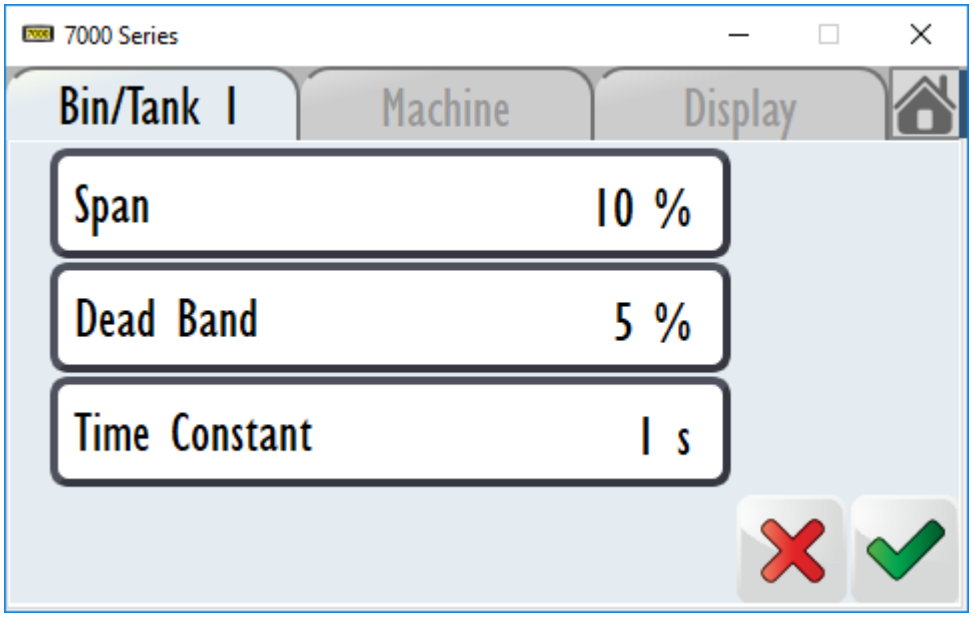
Type: Motor +/-

Maximum: The maximum voltage to apply to the valve. **(Defaults to 12V)**

Minimum: The minimum voltage to apply to the valve. This is typically the lowest voltage that the valve will still operate under. **(11.4V as Min to start)**

Reverse Valve: Change this from NO to YES to swap the direction of the valve (Open/Close direction)

Advanced: These values are for users who want to fine tune their settings further. Smart AG Systems recommends not to alter these settings unless advised.



Span: The range that the valve will use proportional control over when rate is close to target. When past this percentage, the full voltage will be applied. This will prevent a large voltage being applied to make a small change in the valve.

10-20% is the nominal range to try

Dead band: The range where the system will apply no voltage to the valve. This will stop the valve from being worked constantly when the desired rate is achieved.

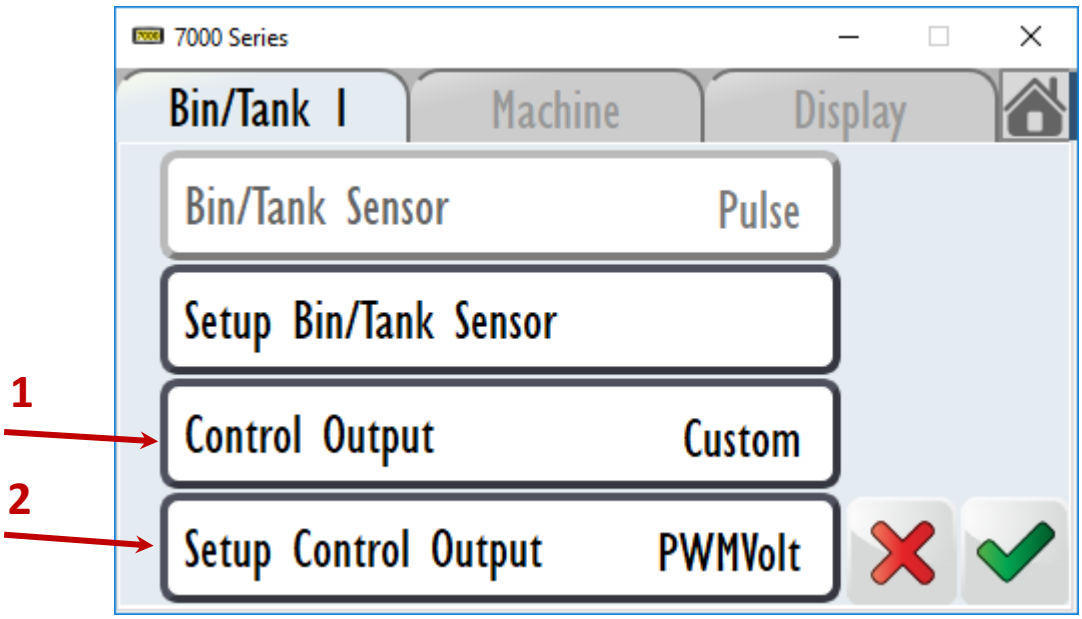
It is highly recommended that this value is set from 5-10 % to increase valve life.

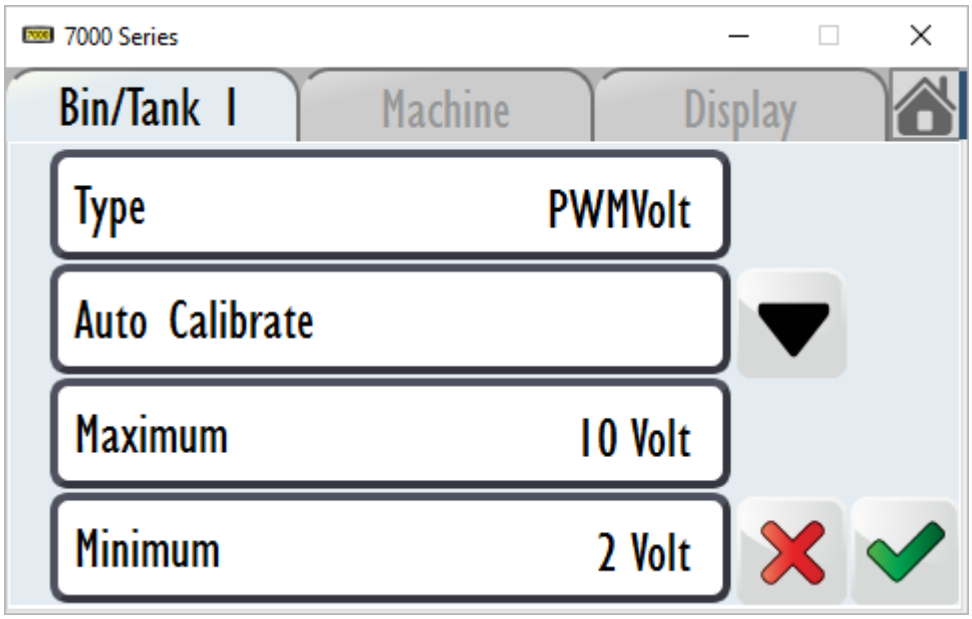
Time Constant: The time in which the monitor will try and control to a new desired rate (i.e. when changing rates). The lower the time, the quicker the rate will change. The higher the value, the
longer the rate will take to change to the new desired application rate.

It is highly recommended that this value is set to 1s

- Return to the Bin/Tank menu to **TEST** the new calibration settings.

Selecting the **PWMVolt** option will allow for auto calibration & manual calibration of an air seeder setup using a proportional/hydraulic valve to drive the metering shaft.





Type: PWMVolt

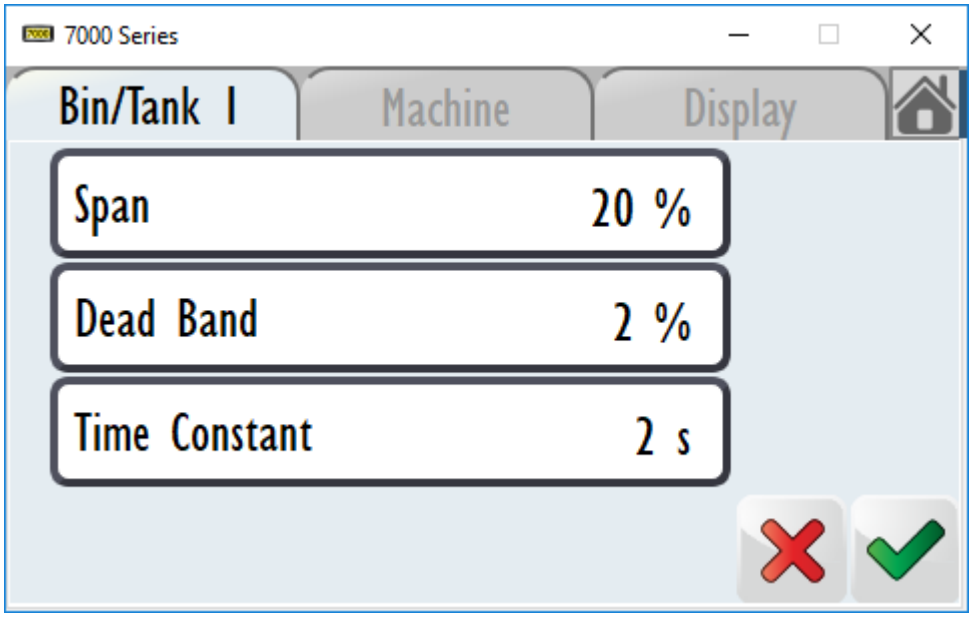
Auto Calibrate: Automatically finds the Min/Max settings for the valve through a series of tests.

Refer to PAGE 42 for more information

Maximum: The maximum voltage to apply to the valve. **(Set 10v as Max to start)**

Minimum: The minimum voltage to apply to the valve. This is typically the lowest voltage that the valve will still operate under. **(Set 2v as Min to start)**

Advanced: These values are for users who want to fine tune their settings further.



Span: The range that the valve will use proportional control over when rate is close to target. When past this percentage, the full voltage will be applied. This will prevent a large voltage being applied to make a small change in the valve.

10-20% is the nominal range to try

Dead band: The range where the system will apply no voltage to the valve. This will stop the valve from being worked constantly when the desired rate is achieved.

It is highly recommended that this value is set from 5-10 % to increase valve life.

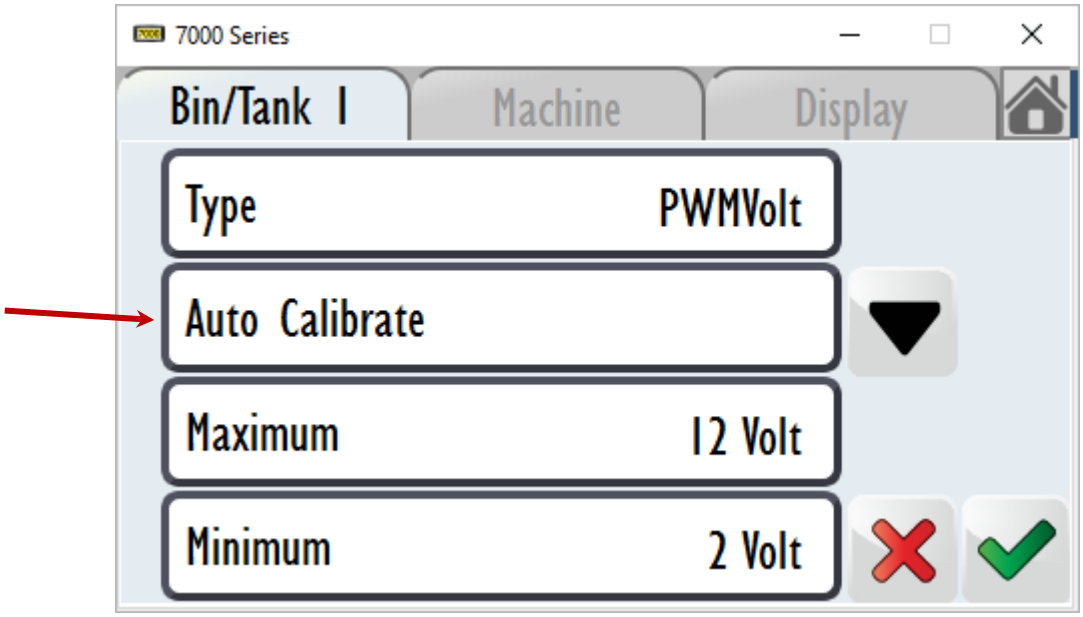
Time Constant: The time in which the monitor will try and control to a new desired rate (i.e. when changing rates). The lower the time, the quicker the rate will change. The higher the value, the
longer the rate will take to change to the new desired application rate.

It is highly recommended that this value is set to 2s

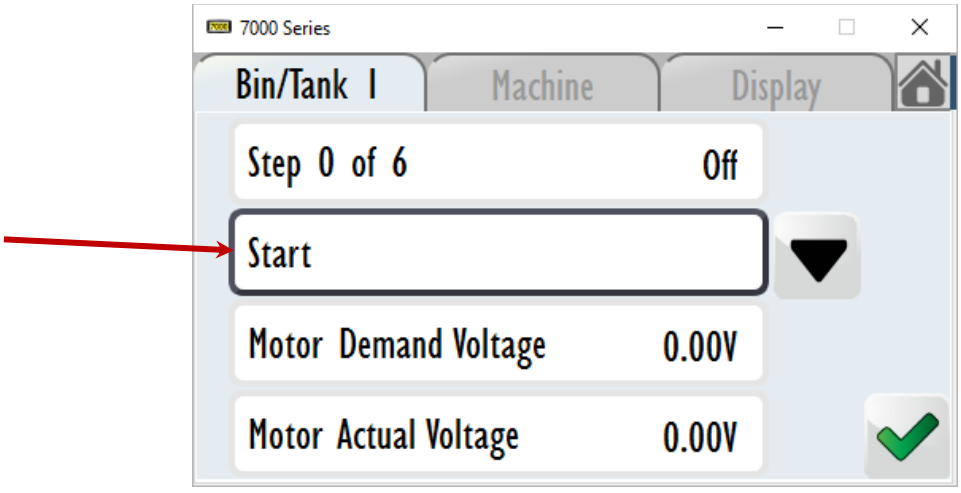
- Return to the Bin/Tank menu to **TEST** the new calibration settings.

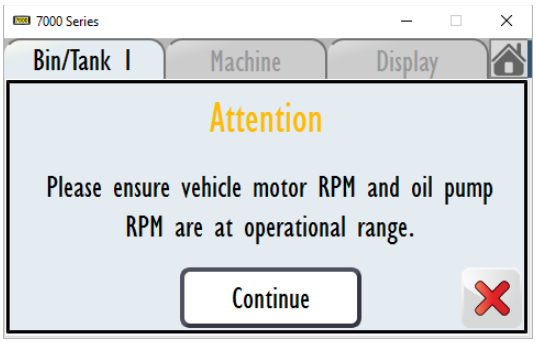
Using the Auto Calibrate button when using a **PWMVolt** option will setup the Min/Max characteristics of that particular system. During this function, please ensure your BIN/TANK is empty or if there is product, ensure you have something to catch it.

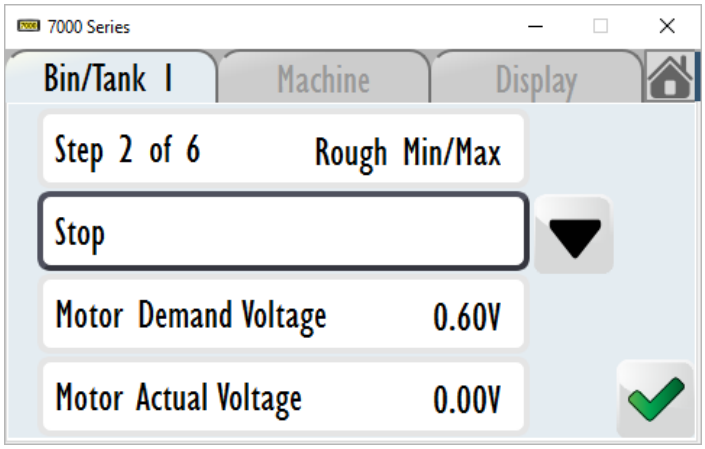
Ensure the Tractor is on, Engine RPM set & Hydraulics are connected and ready to run.



1. Press the **START**
2. Accept the message prompt, and press **Continue**





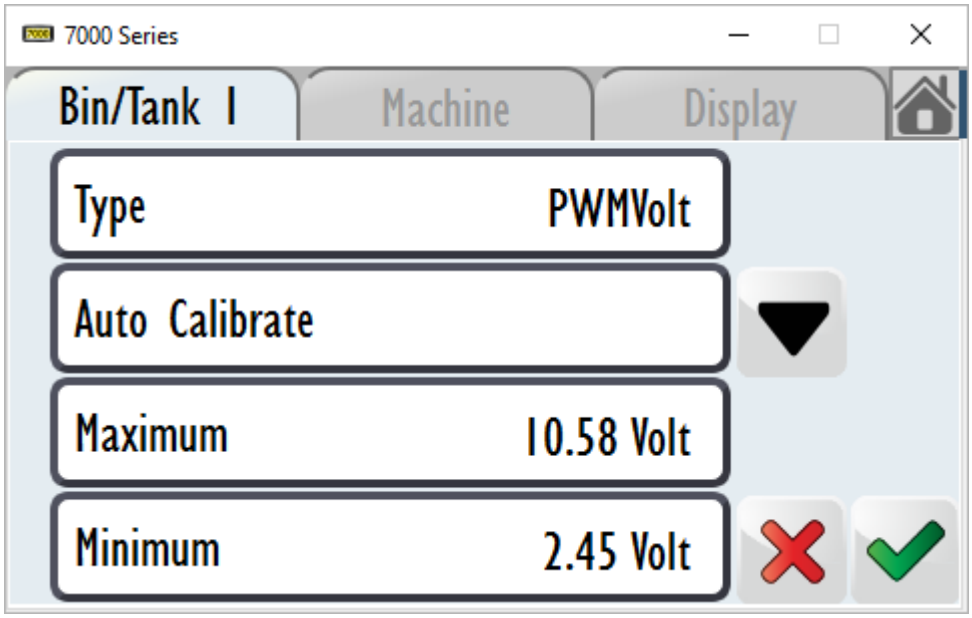


3. The 7500 will now proceed through 6 Steps as follows: - **This can take up to 7 minutes.**
    a. Starting
    b. Rough Min / Max
    c. Rough Min /Max
    d. Fine Tuning Min
    e. Fine Tuning Max
    f. Finding Motor Time Constant

    During these steps, the metering drives will ramp up & down to find the values necessary.

NOTE: At any time, you can press **STOP** and restart the Auto Calibration by following the previous steps.

4. When the Auto Calibrate has been completed, accept the **OK** and select the **TICK** to return to the control screen. The new values will be placed in the **Maximum** & **Minimum** fields.

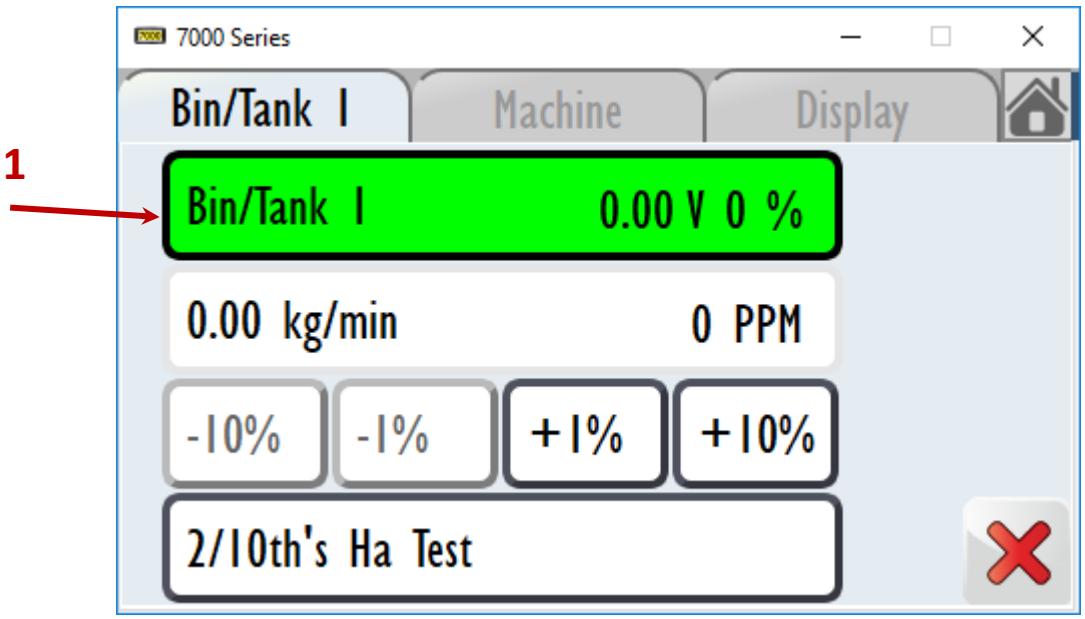


5. Return to the Bin/Tank menu to **TEST** the new calibration settings.

Test (5)

The output test allows the user to check the metering control and voltage settings are working correctly.

This will allow the metering or control valve to open and allow feedback from the sensors.



To test the output of a Tank, follow these steps:

1. Select the green **Bin/Tank 1** button to enable it.
   WARNING: This will turn on the tank output immediately.

2. Adjust the **Output % (by +1%)** to give the output you desire.
   a. Does the metering drive turn?
   b. Continue to up the percentage until the metering drive is turning slowly
   c. You will be displayed with X voltage & X % values.
   d. These values will be close to the auto calibrated figures

3. Select the red **Bin/Tank 1** button to disable it.

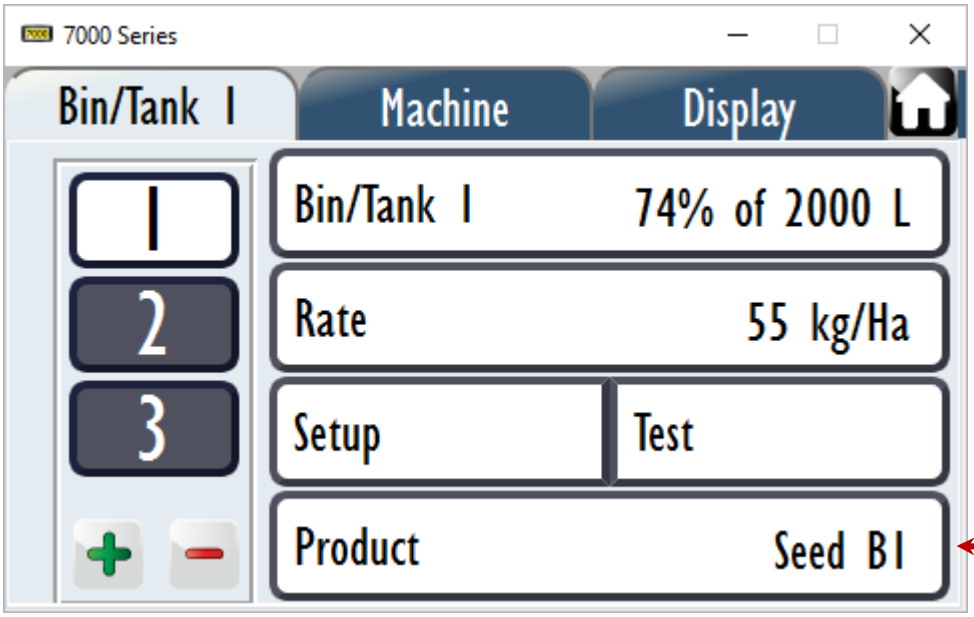
4. Select the green **Tick** button to exit the test screen.

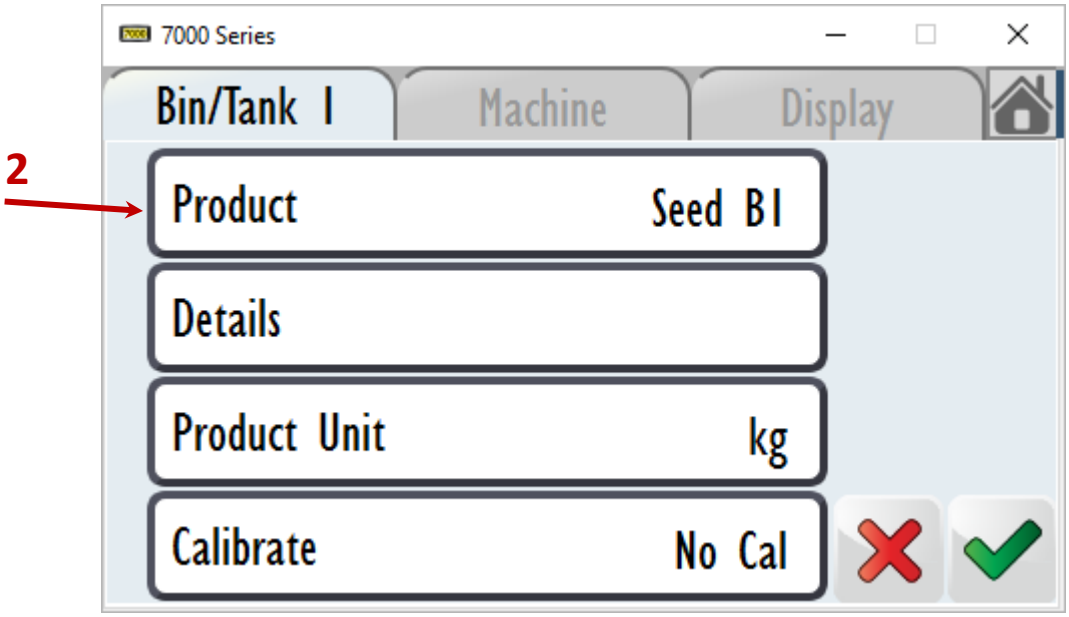
THE TEST SCREEN CAN ALSO BE USED TO FIND THE MIN AND MAXIMUM VALUES OF THE METERING DRIVE. BY ADJUSTING THE PERCENTAGE VALUES YOU CAN FIND THE MIN/MAX VOLTAGES REQUIRED TO MOVE THE METERING DRIVE. SIMPLY COPY THESE SETTINGS IN THE MIN/MAX SETTINGS DURING THE PREVIOUS SETUPS.

Product calibration (metering drive) (6)

Each tank must be calibrated to the metering drive to allow the 7500 to achieve the correct applied rate.
The 7500 has the ability to recall multiple pulses per kilo (dry rate) or pulses per litre (liquid) calibration factors for multiple machine & calibration setups.

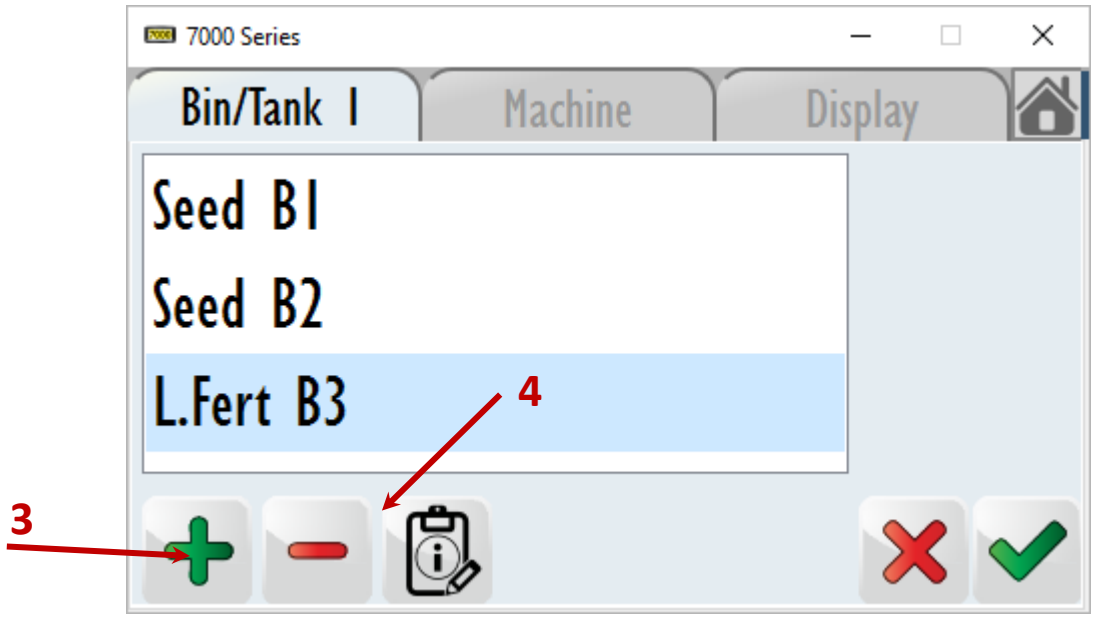
Creating or removing a Flow Calibration





1. Select **Product**
2. Select the "**Product" Calibration** button

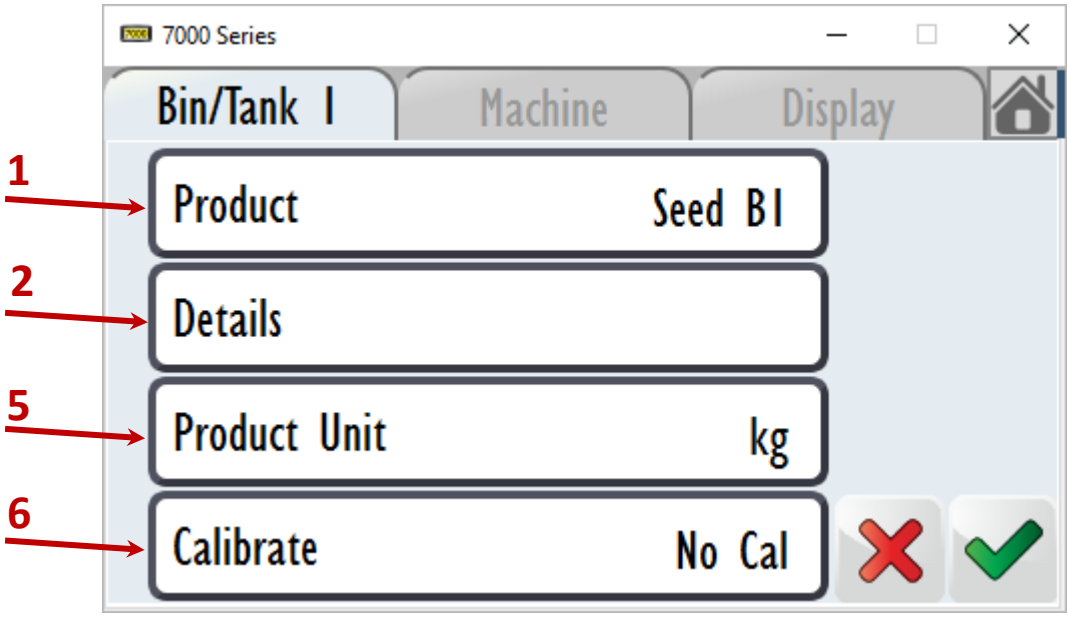
3. Select the **+** button to create a product.
    a. Enter the name of a product.
    b. Select the green **Tick** button.
4. To remove a product:
    a. Select a product.
    b. Select the **–** button.
5. Select the green **Tick** button.



In the example above, the setup includes 3 Bins (2x Seed & 1x Liquid).

Note: The above table is shared by all Bins. It's best to add all Bins in one go.

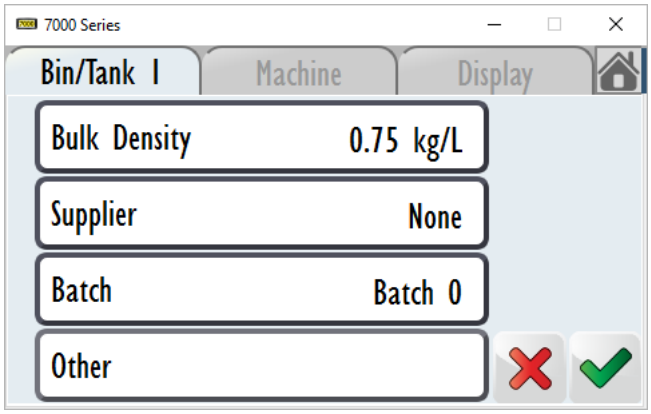
NOTE: When calibrating a product, it will calibrate that metering shaft for the specific Bin/Tank that it is in.
Make certain that you are in the correct tank when calibrating the product.



1. Select a tank from the list on the left to select it. **NOTE:** The calibration will apply for this product in this tank only, the product in a different tank will have to be calibrated again).

2. Select **Details** and enter the **Bulk Density** of the seed or fertilizer being used. Bulk density is used to determine the **"Estimated Bin Level"**.

   Bulk density is determined by the following method:
   a. Determine the volume (Liters) of an available container. **E.g. 2 Litre ice-cream tub**
   b. Determine the weight of the product in a level filled container **E.g. 1.5kg**
   c. Divide the weight by the volume **E.g. 1.5kg/2L = 0.75kg/l**

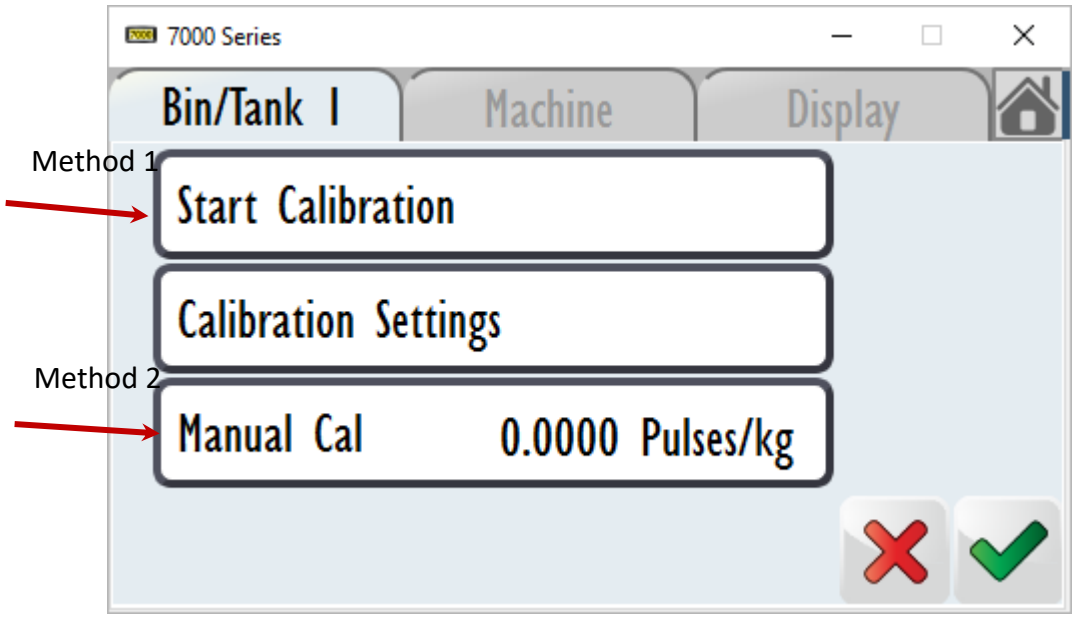


3. If required, enter the **Supplier** & **Batch** details.
4. Press the **Tick** button when done.
5. **Product Unit** can be either kg or L depending on product being calibrated.

6. Select the **Calibrate** button

Calibration Method

The calibration factor relates to the number of pulses per kilo or litre generated by the metering pickup or flow sensor. The pulse factor is unique to every Bin/Tank and will vary slightly depending on product characteristics & liquid viscosity.



Two methods of Flow Meter Calibration are available:

Method 1: Full System Calibration (calculated method)

Method 2: Manual Factor or Known PPL (found on flow meter tag or previous seed rate controller)

Method 1: Full System Calibration (calculated method)

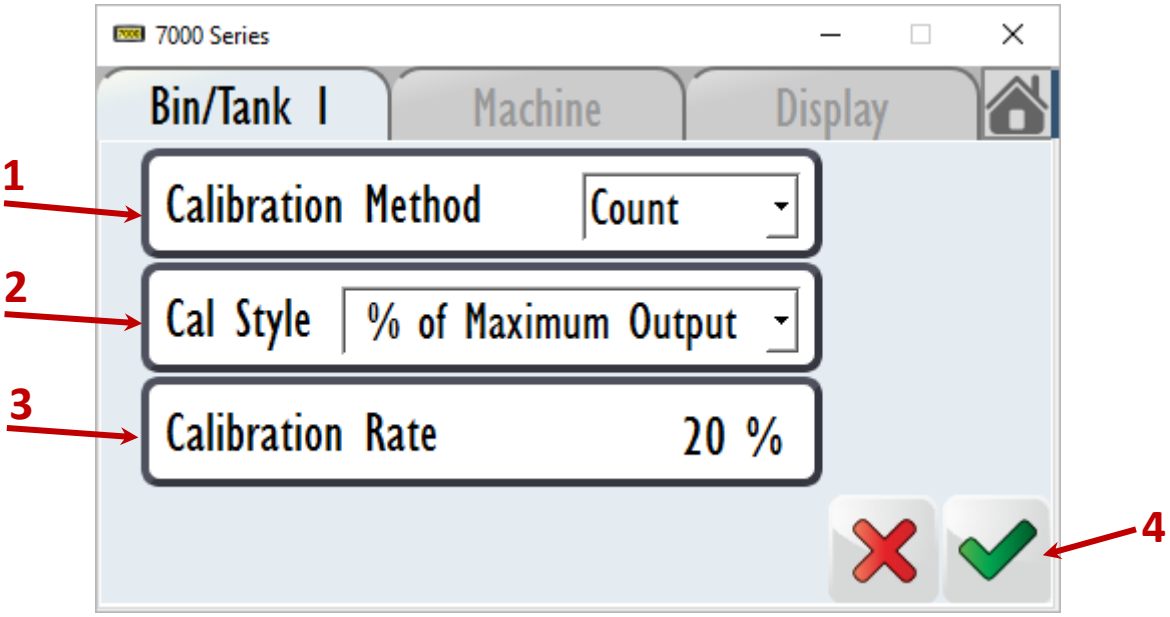
A full system calibration is preferred as it takes into account any subtleties and variances with the machine metering system and product flow characteristics.

There are three variations on a Full System Calibration:

1. **Count** *(preferred & example explained)*
    a. Mass of discharge per pulse counts
    b. Product is metered for a preset number of pulses
    c. Enter the mass of product metered

2. **Time**
    a. Mass of discharge in a set period of time
    b. Product is metered for a preset number of seconds
    c. The unit automatically counts the pulses
    d. Enter the mass of product metered

3. **Weight**
    a. Mass of discharge
    b. Product is metered to approximate mass
    c. The unit automatically counts the pulses
    d. Enter the mass of product metered



1. Select the calibration method from the dropdown list **(Count, Time or Volume)**

2. Select the **Cal Style** rate **(Application Rate or Percentage of maximum output)** from the dropdown list**.** This is the rate at which the calibration will take place.

3. Enter the **Calibration Rate** or P**ercentage**. Depending on the **Cal Style** rate option chosen, **Calibration Rate** may be greyed out. Using the above method, select **20%**. (this will open the control valve to 20% rate as not to cause any damage to your motor/pump)

4. Select the green **Tick** button to return to the previous screen.

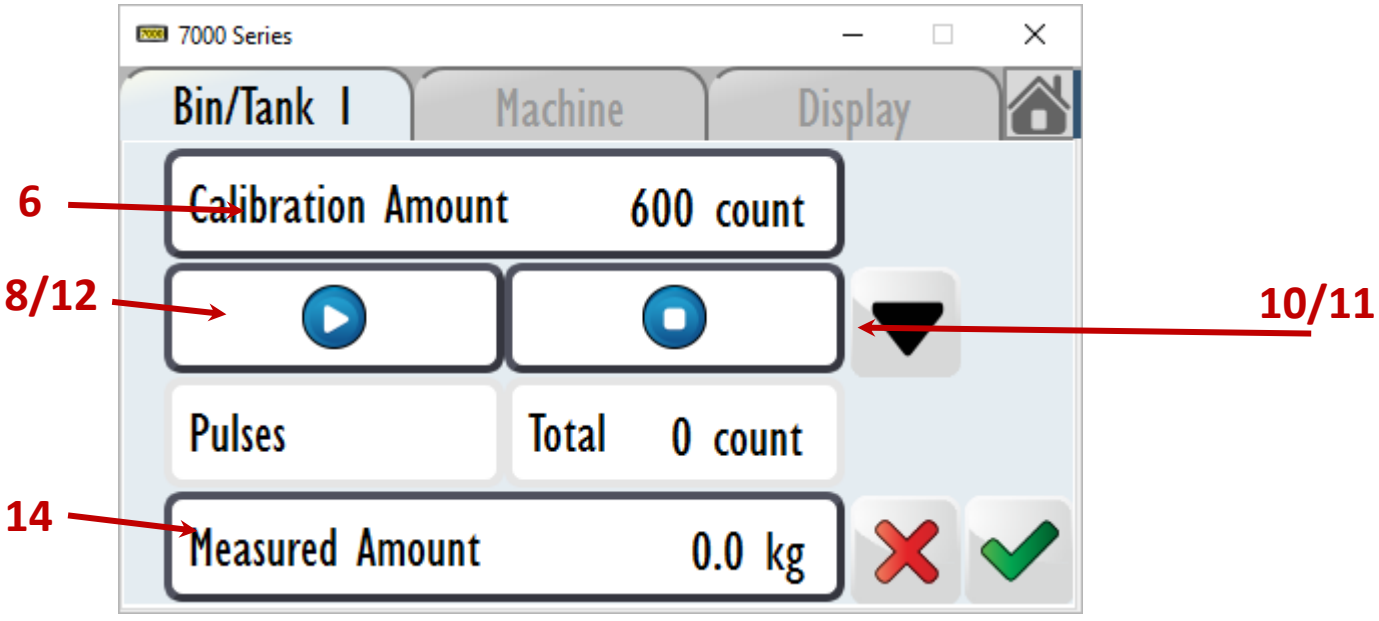
5. Select **Start Calibration**.

6. Select **Calibration Amount**.
    a. If calibrating by **Counts** we suggest **600** counts**.**
    b. If calibrating by **Time**, enter the number of seconds to run the calibration for. (e.g. 35)
    c. If calibrating by **Weight,** enter the weight target to be calibrated
7. Set up the seeder for calibration as per the manufacturer's instruction including calibration trays (or similar), turning fan off (if fitted) and engaging hydraulic drive (if fitted).

8. Prime the metering system by pressing Play
(WARNING: This will turn on the output of the Bin selected).

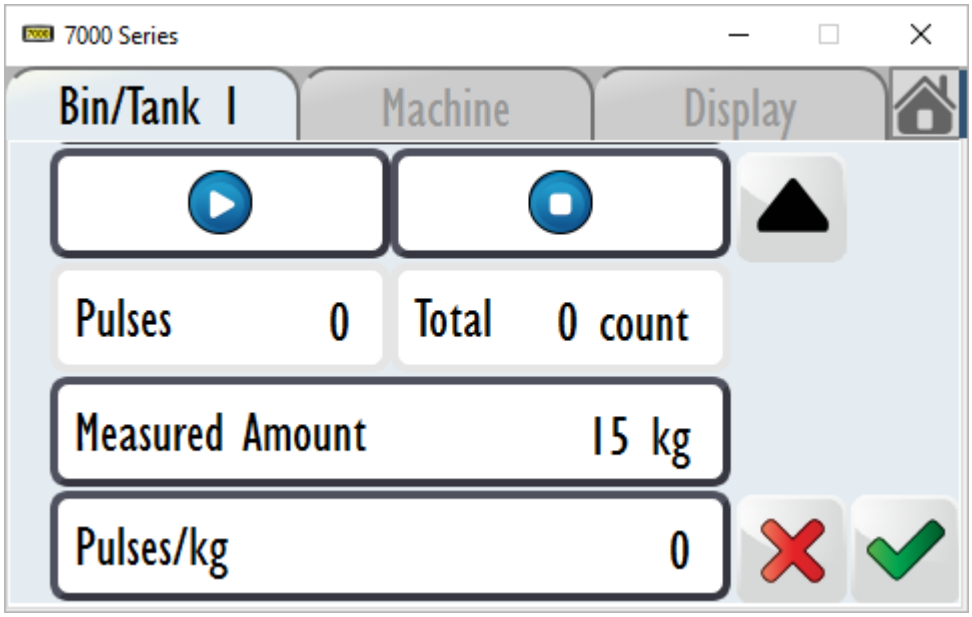
9. Press Stop when product appears in bucket.

10. Return product in bucket back to bin or discard.

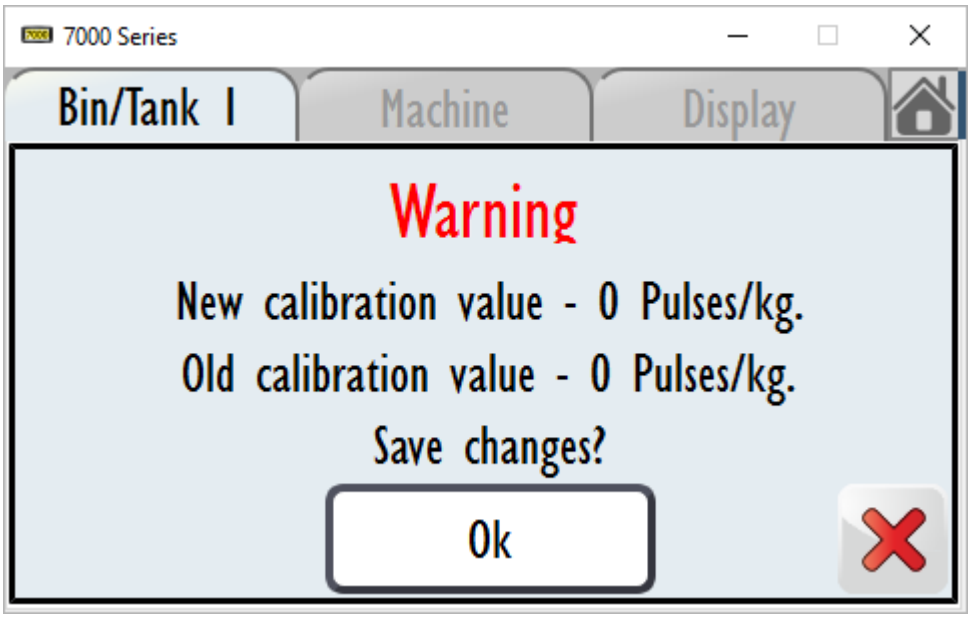


11. Select the **STOP** button to restart the counter.

12. Select the **Play** button. **WARNING**: This will turn on the output of the tank selected.
13. Wait as the container fills up with product to the desired measure mark. If it looks like it will overflow, select the **Stop** button & start again.
14. Select the **Measured Amount** button and enter the amount of product discharged. (in kg)
15. Select the **Tick** button.



16. You will now be prompted to update the current Pulse per kilo rate.



17. Press **OK** to accept the changes.
18. Return to the **Main** menu to perform a 2/10ths of a hectare test if required.

NOTES:

- If the calculated **FLOW CAL** (Pulses/L) differs greatly from the sensor calibration tag attached to the flow meter, repeat the test. Sometimes it's best to do this 3 times to

obtain a better average.

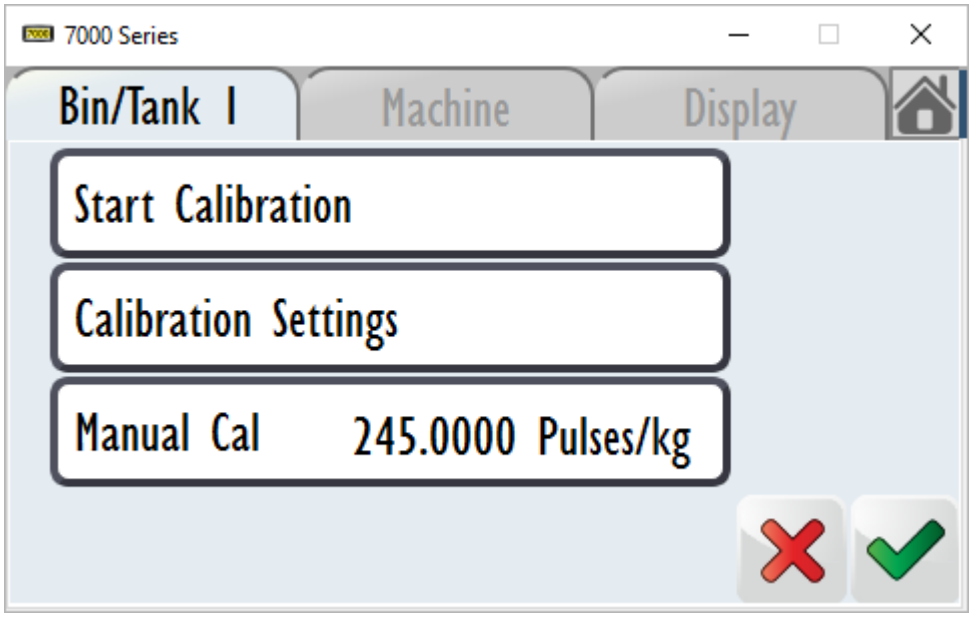
Method 1: Manual Factor PPKG or Known PPL

In some cases, it's possible to enter a manual calibration factor in lieu of a complete calibration.

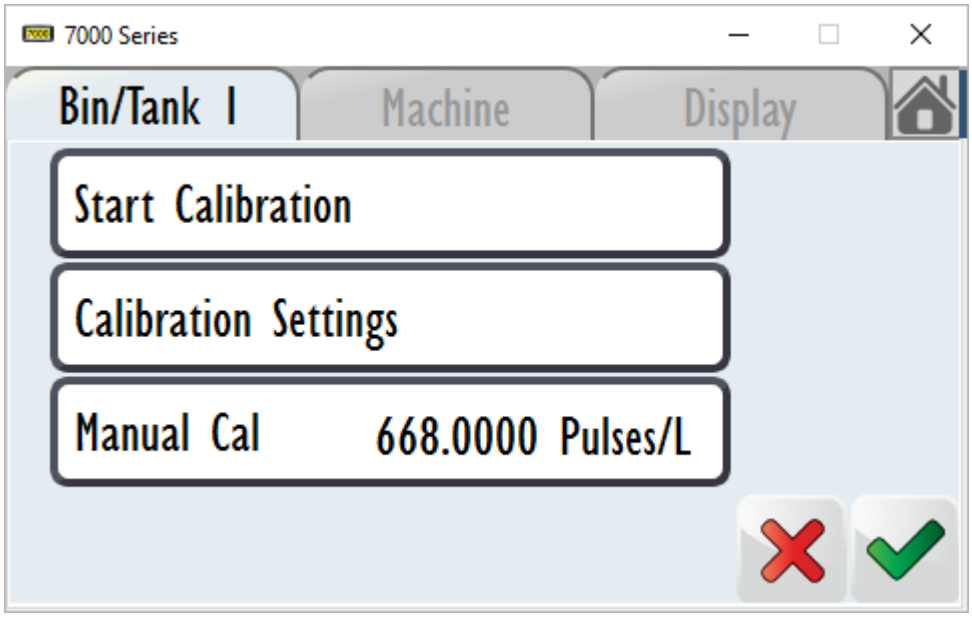
In the case of our standard flow meter (Liquid) supplied by POLMAC a tag attached will indicate the current PPL factor for that flow insert. If the value is known, insert the value in the Pulse/L window as shown below.

You may also enter a manual calculation from an existing air seeder monitor.

SEED/FERT CALIBRATION EXAMPLE



LIQUID CALIBRATION EXAMPLE

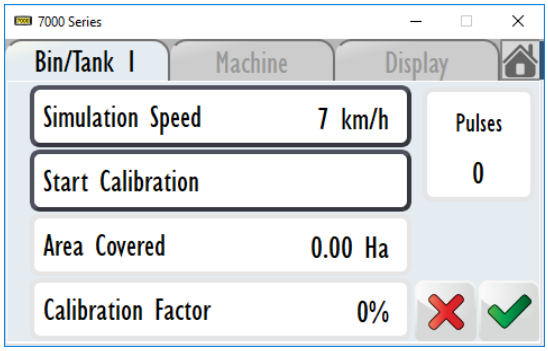


It is recommended that Method 1 be performed a minimum of three times in all cases where small seeds are being used.

FINE TUNING CALIBRATION FACTORS

Calibration factors can be fine-tuned by using the two tenths of a hectare test. This test will run the selected drive for 2/10th of a hectare while stationery. Product should be caught and weighed to check bin calibration factors are correct.

1. Fill the bin with a pre-measured quantity of product
2. Return to **Bin/Tank X**
3. Select **Test**
4. Select **2/10th's Ha Test**



5. Select the **Simulation Speed** and enter your typical seeding speed
6. Check the metering system is primed with product and ready to be caught by weighing
    i. Return the product to the bin.
7. Press the **START CALIBRATION**
    i. Product will now start to flow at the simulated speed & rate
8. After metering the pre-measured quantity, press **STOP**
9. Weigh the product caught
10. Enter the weight in the **Enter Weight (kg)**
11. Press the **Tick**
12. The calibration factor will now be updated
13. Press the **Tick** to exit

Example
If the bin rate was set to 50kg/ha, after a 2/10th ha test, 10kg of product should have been metered.
Assuming the "CAL SPEED" was correct during calibration (see step 3) and the metering system is linear through its entire range. If the metered quantity is not correct apply the formula below. Using the above example, say 11.4kg is metered instead of 10kg and 48.5pulses/kg was the product calibration factor.

Formula

new calibration factor	=	expected quantity x old calibration factor ÷ actual quantity	
Expected quantity	=	10 kg	(desired quantity in kg or litres)
Old calibration factor	=	48.5 pulses/kg	(pulses per kilo or pulses per litre)
Actual quantity	=	11.4 kg	(pre-measured weight or volume)

New calibration factor = 10 / 11.4 x 48.5 pulses/kg
= 42.54 pulses/kg

PLEASE TURN PAGE FOR IMPORTANT NOTES.

- **Metering will ONLY occur if the "FAN" alarms are disabled/critical or the fan is operating with the low and high alarm points.**
- **The 2/10th ha test will NOT work on ground drive machines i.e. gearbox drive and gate actuator drives.**

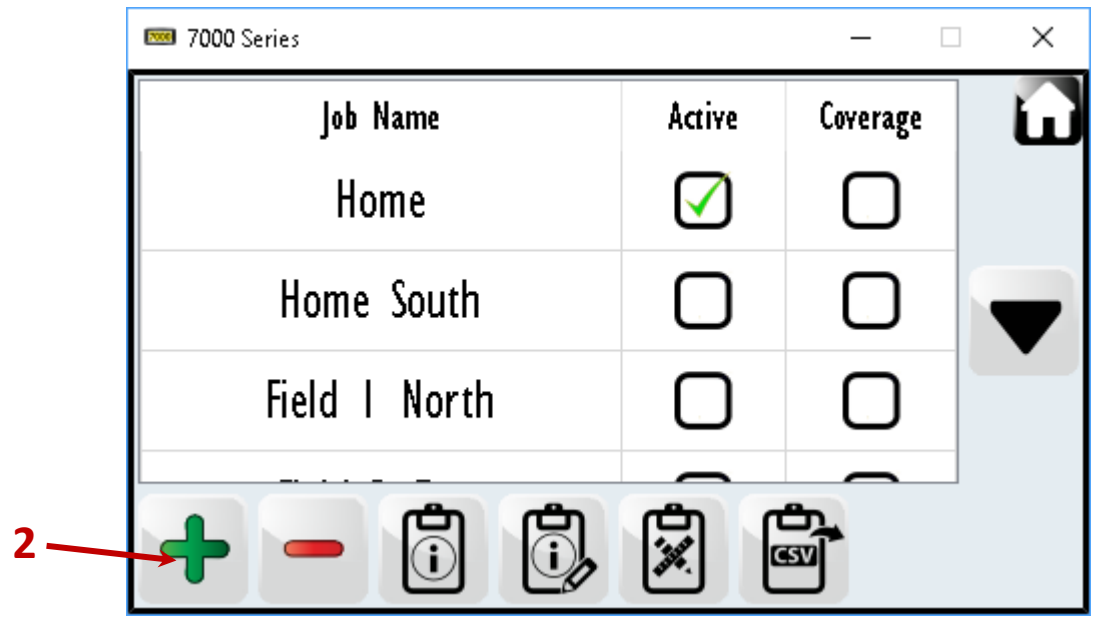
JOBS (2)

Jobs can be created to record the total and applied duration, distance and area as well as all the applied products.

NOTE: With NO jobs selected you will be unable to record Ha on a front screen tile widget. Coverage should only be selected 1 job at a time. This feature only works when GPS is connected.

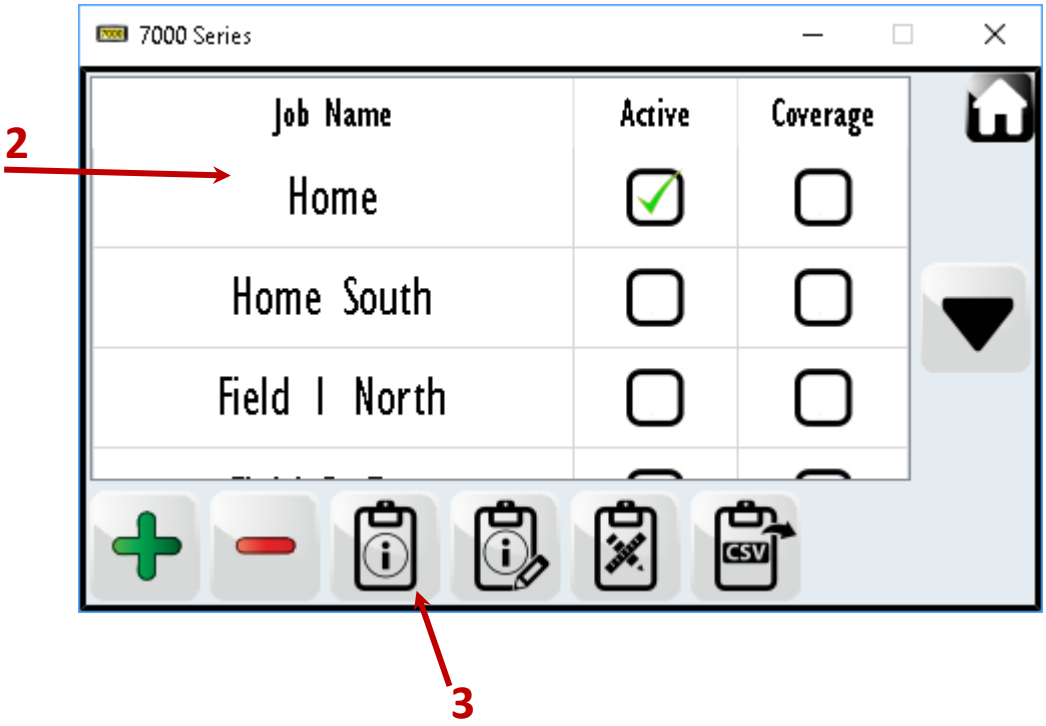
Creating a job

1. Navigate to the **Job** page**.**
2. Select the **+** button.
3. Enter your preferred Job name.
4. Select the green **Tick** button.



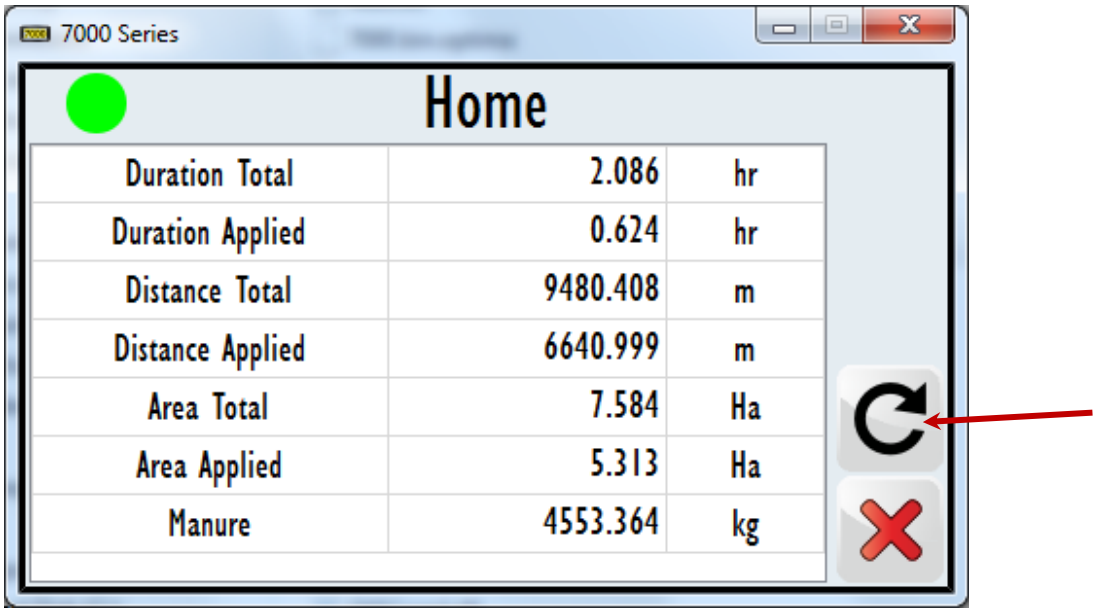
Viewing a job's details

1. Navigate to the **Job** page.
2. Select the Job you want to view the details of (the Job will be highlighted blue).
3. Select the **Job details** button.



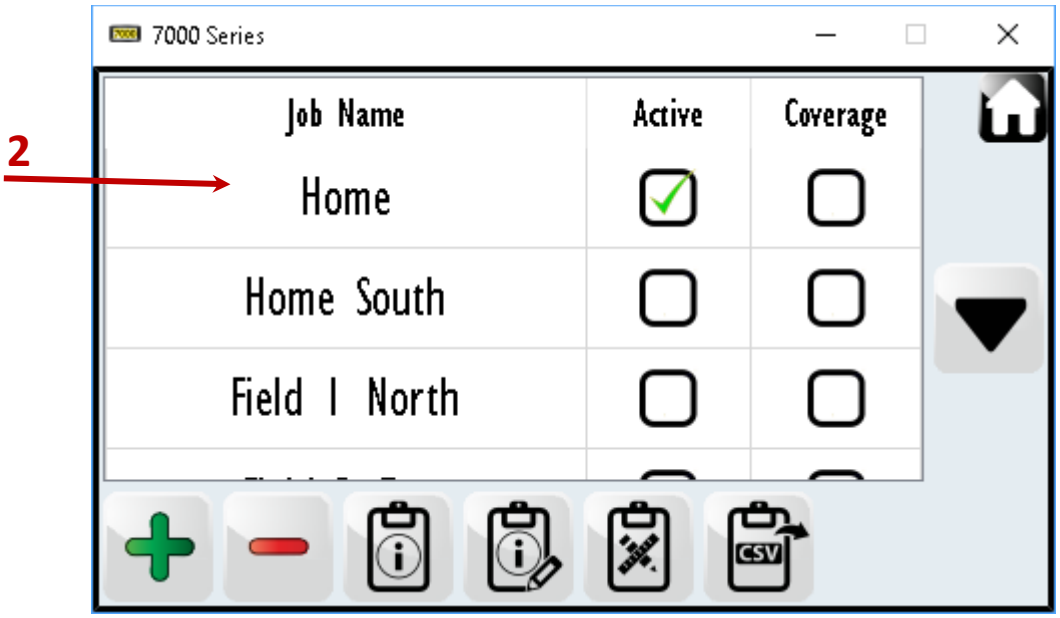
Resetting job details

You can reset the job details by selecting the **RESET** icon (see below). This will reset all totals.



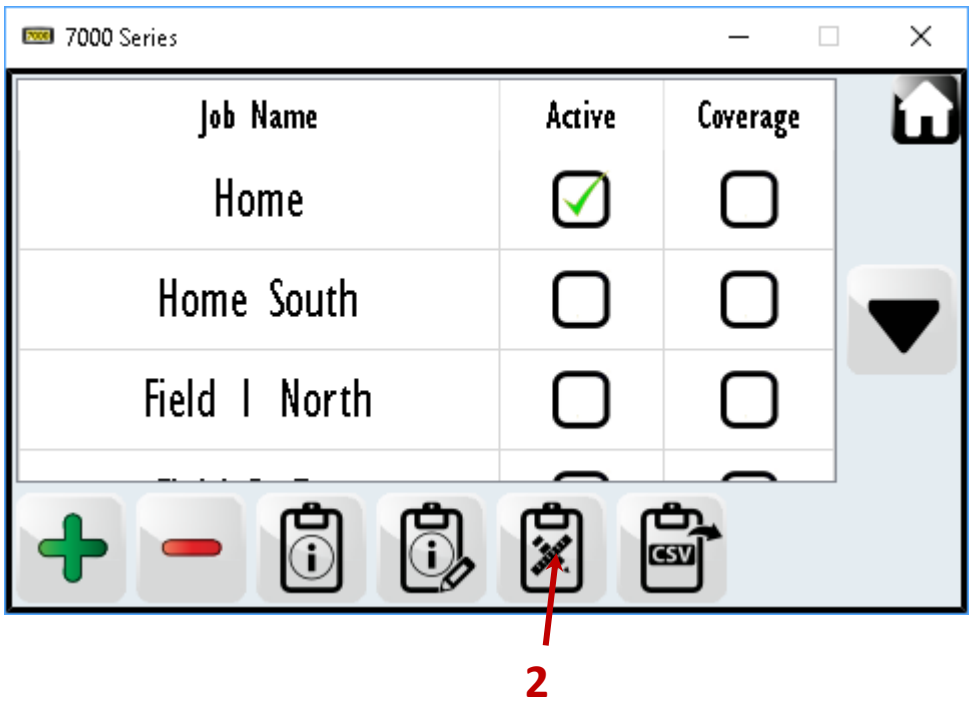
Editing a job's name

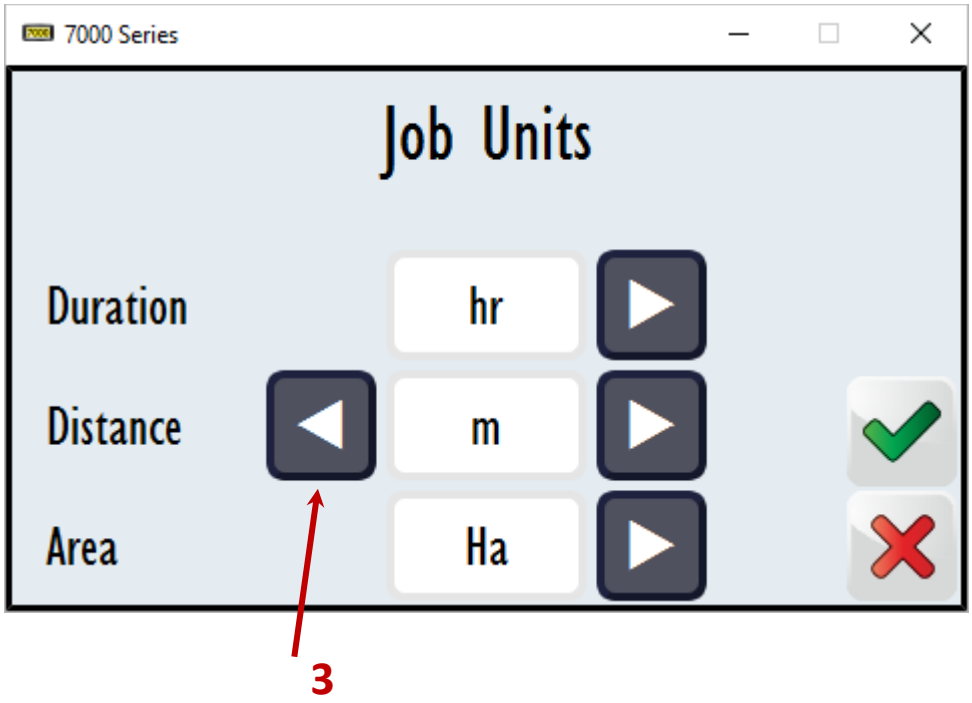
1. Navigate to the **Job** page
2. Select the Job whose name you want edit (the Job will be highlighted blue).
3. Select the **Edit Job Name** button.
4. Enter a new name and then select the green **Tick** button.



Changing job display units

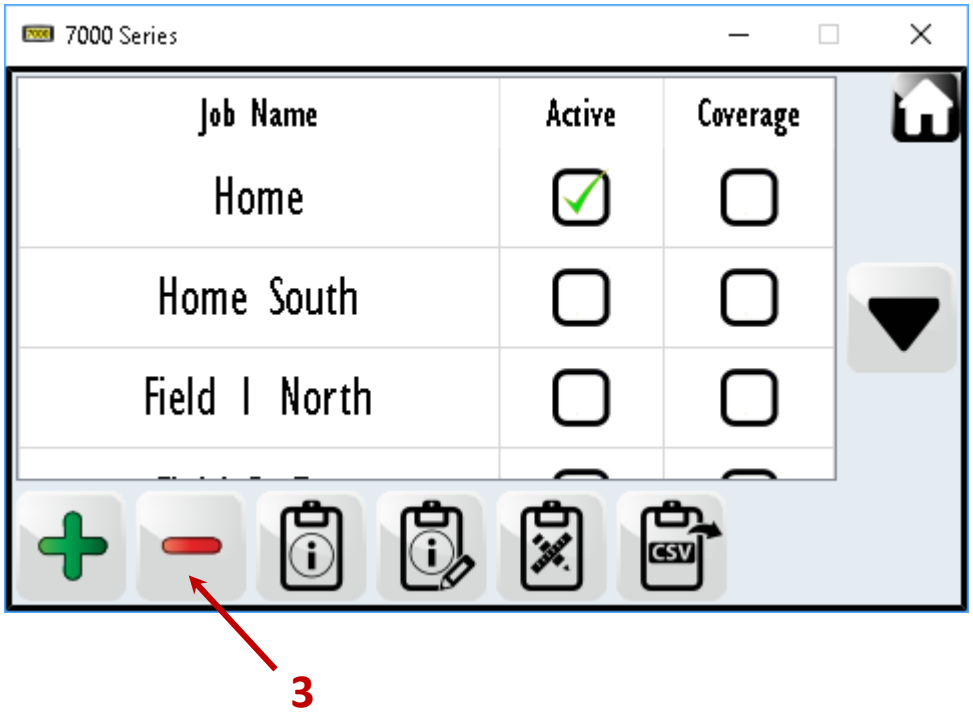
1. Navigate to the Job page.
2. Select the **Edit Job Units** button.
3. Select the **<-** and **->** buttons to change the units used for duration, distance and area.
4. Select the green **Tick** button to accept these changes.





Deleting a job

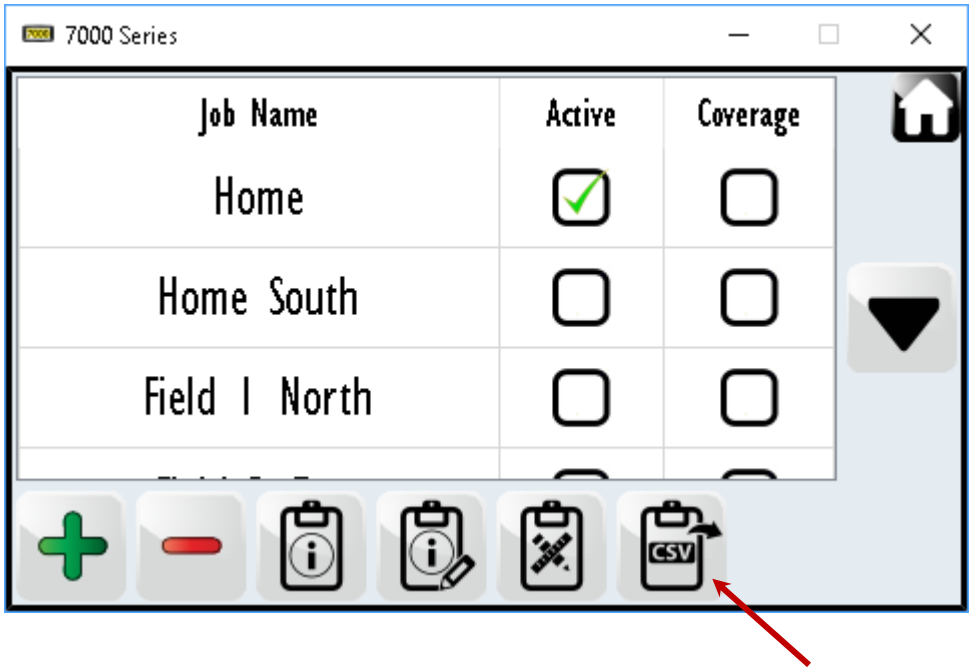
1. Navigate to the **Job** page.
2. Select the Job you want to delete (it will be highlighted blue).
3. Select the **–** button
   WARNING: You will lose all of the information stored in this Job if you delete it.
4. Select **Remove** in the **Warning** screen.



Exporting jobs (CSV)

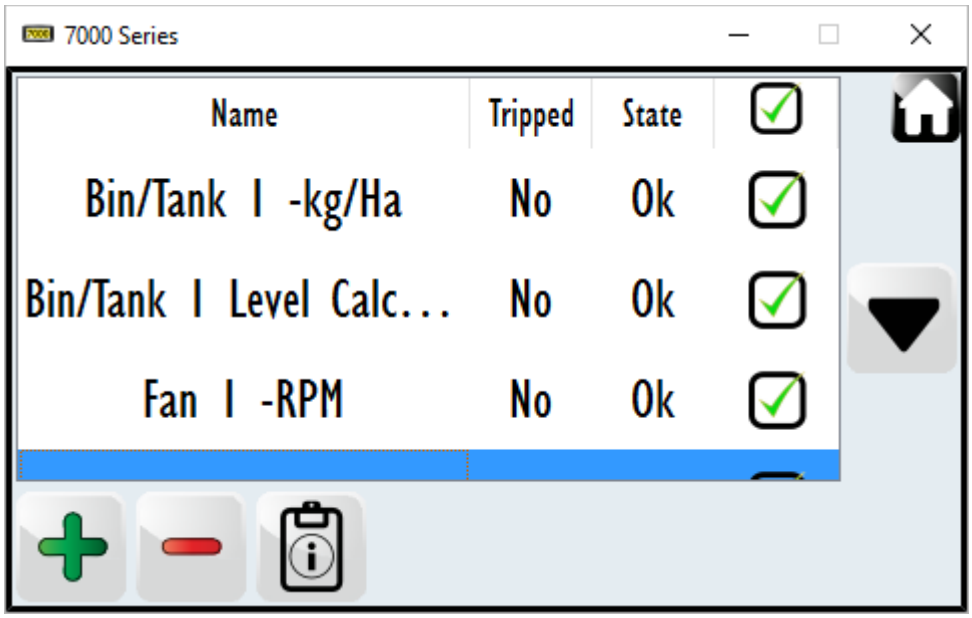
1. Navigate to the **Job** page
2. Insert a USB memory stick in to the AC-7000 in cab harness.
3. Select the **CSV** button.
4. A prompt will determine whether the export was successful.

If successful, all job data will be exported to the USB stick for viewing in any Farm software that can import a CSV file.



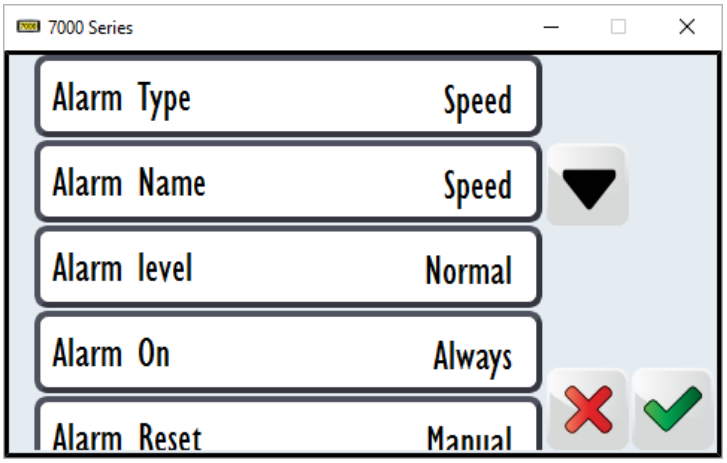
ALARMS (3)

Alarms can be created to give a visual and audible warning to the user or, if critical, put the system into Hold Mode, when a recordable value (speed, tank level, etc.) exceeds a set limit. The visual indicator is in the form of a highlighted RED tab on the right hand side of the display and a RED notification on the alarm indicator in the side menu.



Creating an alarm

1. Navigate to the **Alarm** page from the **Settings** Menu.
2. Select the **+** button to navigate to the **Alarm setup** page.
3. In the **Alarm setup** page, set up the Alarm according to your preferences.
   NOTE: The Alarm options are listed below.



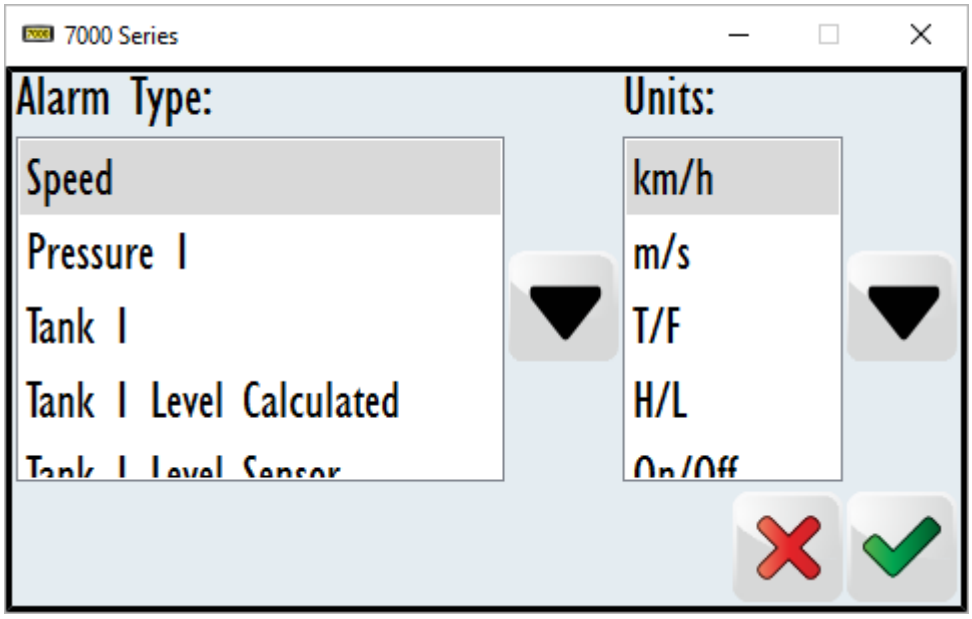
   NOTE: Alarms are available for ALL inputs/Rates/Jobs.

4. Refer to the Alarm options on the next page before selecting the green **Tick** button.

Alarm options

An Alarm can be set up with many different options which are listed and explained here.

1. **Alarm**: Select the **Alarm** button to go to the **Value and Unit Selection** page.
    a. Select what value (speed, rate, tank level etc.) you wish to alarm.
    b. Once selected, choose a unit.



    c. Select the green **Tick** button to accept these changes.

2. **Alarm Level**: Select to toggle between **Normal** and **Critical.**
    a. **Normal:** The Alarm will run as a notification alarm. The system will continue operating but the user will be informed that the typical operating conditions have been breached.
    b. **Critical:** When a critical Alarm is triggered, the system will be forced out of Run Mode into Hold Mode. These should be considered for safety and also as risk reduction/

3. **Alarm On**: Select to toggle between **Always** and **Run only**.
    a. **Always**: The Alarm is always active.
    b. **Run only**: The Alarm will only activate when the implement is running.

4. **Auto Reset**: Select to toggle between **Automatic** and **Manual**.
    a. **Automatic:** The Alarm will automatically reset once it is no longer in the **Alarm** state; the user will not have to select the **Reset** button to reset.
    b. **Manual:** The Alarm will not reset once it is no longer in the **Alarm** state; the user will have to select the **Reset** button to reset.

5. **Alarm Buzzer Period**: Select to input a numerical value.
    a. Enter a value in seconds for how long the audible warning will sound.
    NOTE: This is only the audible warning; the visual warning will last until reset.

6. **Min Set Point**: Select to toggle between **On** and **Off**.
    a. **On:** When the value of the Alarm drops below the given Min Value it will go into the **Alarm** state.
    b. **Off:** When the value of the Alarm drops below the given Min Value it will not go into the **Alarm** state.

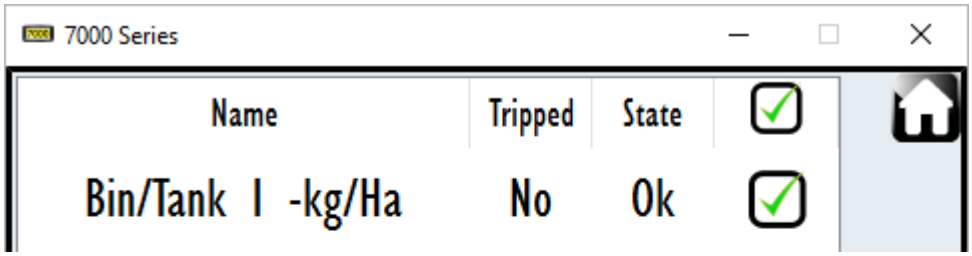
7. **Min Value**: Select to input a numerical value.
    a. Input the minimum value for the Alarm.

8. **Max Set Point**: Select to toggle between **On** and **Off.**
    a. **On:** When the value of the Alarm goes above the given Max Value it will go into the **Alarm** state.
    b. **Off:** When the value of the Alarm goes above the given Max Value it will not go into the **Alarm** state.

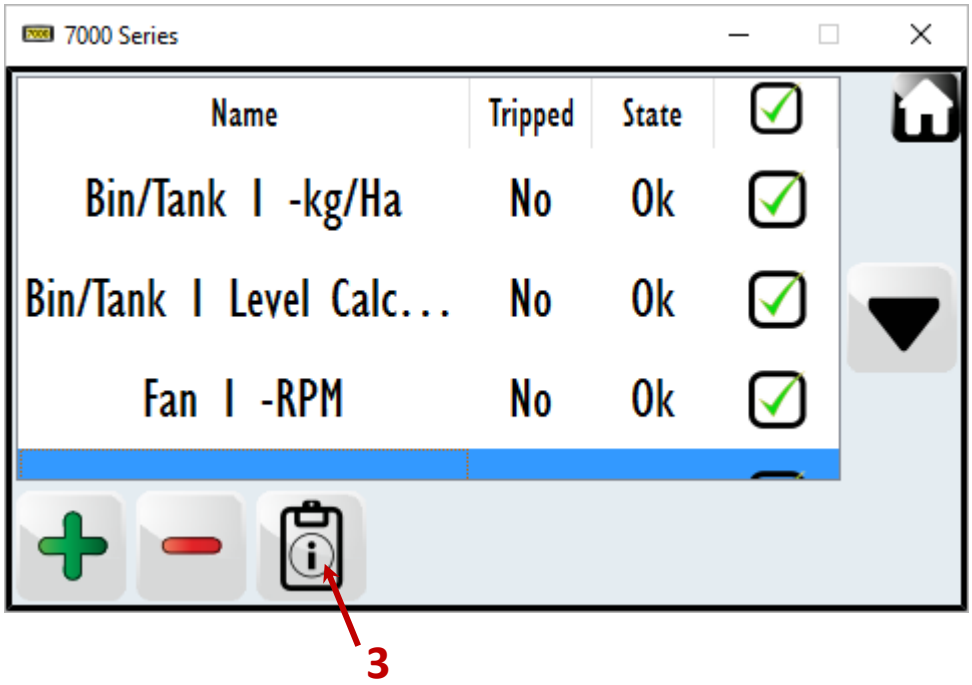
9. **Max Value**: Select to input a numerical value.
    a. Input the maximum value for the Alarm.

Activate / Deactivate alarm

At any stage you can enable/ disable the Alarm by selecting the row and then the green **Tick** button on the right hand side.



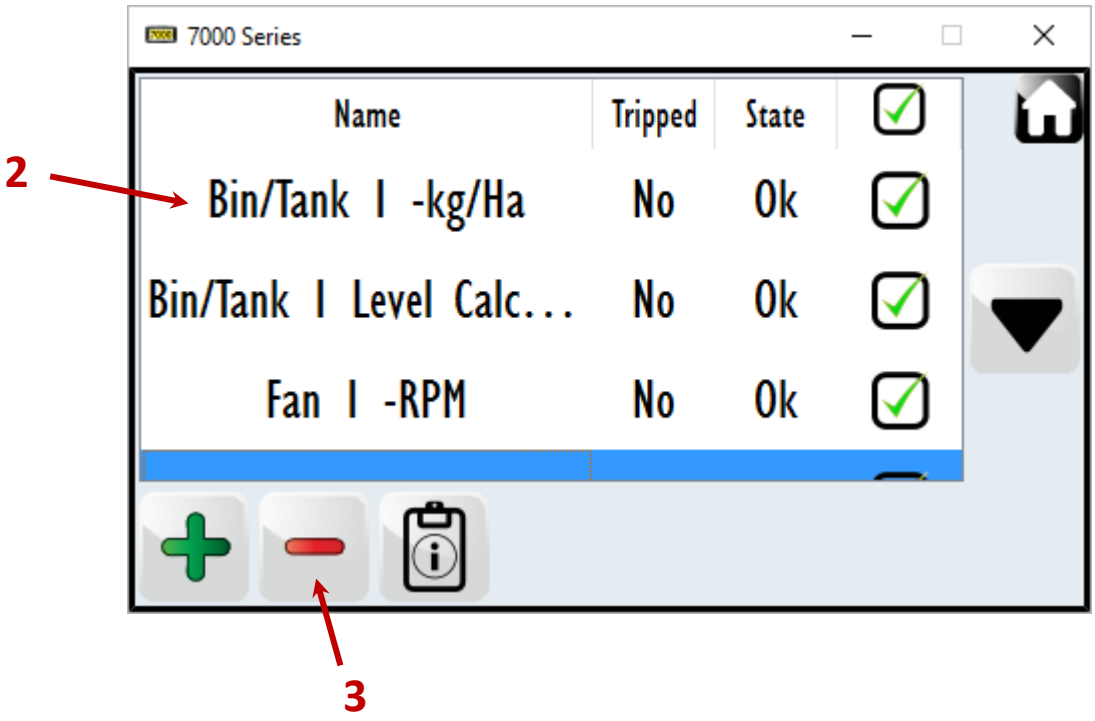
Editing an alarm

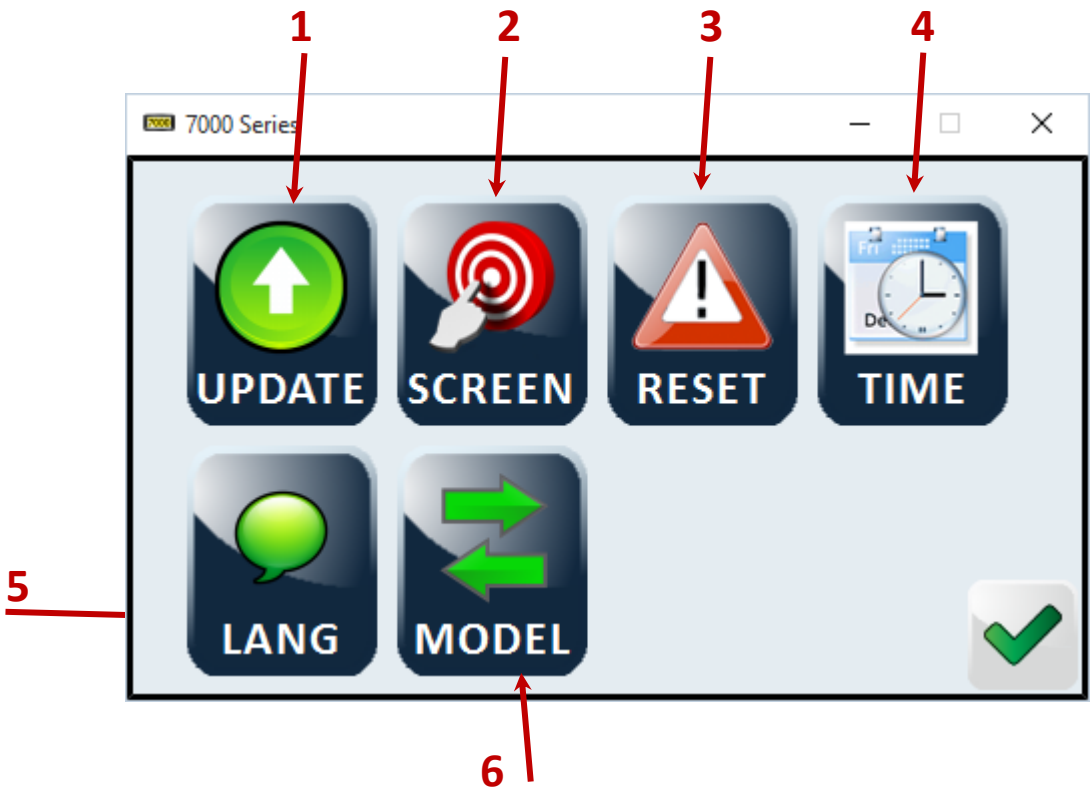


1. Navigate to the **Alarm** page
2. Select an Alarm in the alarm list**.** **NOTE:** the selected Alarm will be highlighted blue).
3. Select the **Edit Alarm** button.
4. Edit the Alarm to your preferences. **NOTE:** The Alarm options are listed above.
5. Select the green **Tick** button.

Deleting an alarm

1. Navigate to the **Alarm** page
2. Select an Alarm in the Alarm list . **NOTE:** the selected Alarm will highlighted blue.
3. Select the **–** button**.** WARNING: All the Alarm settings will be lost.





Update (Software)

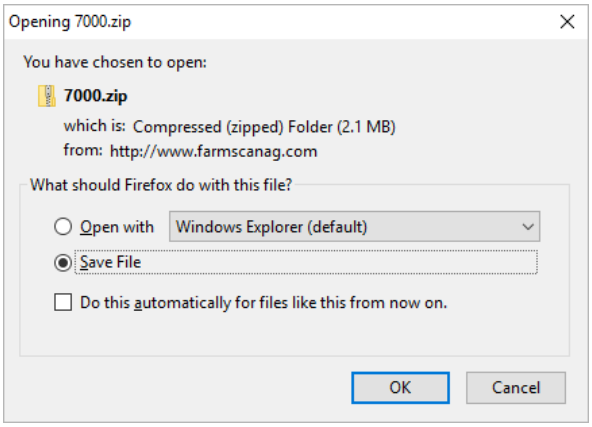
Updates the software running on the 7000 series device via USB stick.

WARNING: An update requires the 7000 series software to restart upon completion. It is also advised to BACKUP your settings to the USB stick. Refer to PAGE XX before updating your software.

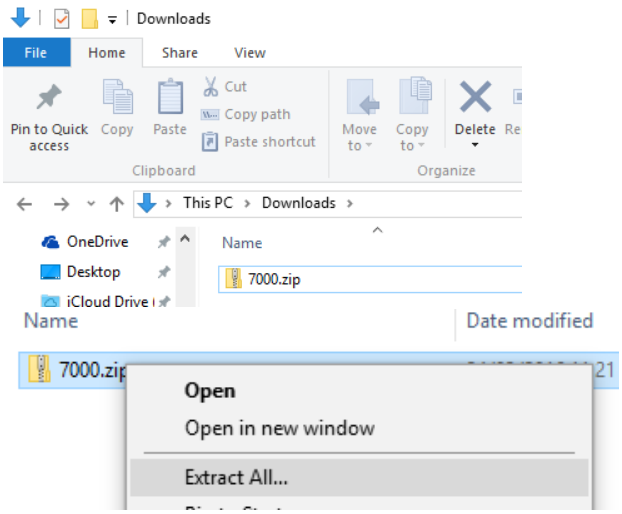
The 7000 can update can be retrieved via the Smart AG Systems website:

Direct from the Smart AG Systems website

1. Have a USB to hand that is completely empty & insert into your PC
2. Open a web browser and enter the following web address :
    a. www.farmscanag.com/exe/7000/7000.zip
3. You be prompted to download and SAVE this File
4. Press OK

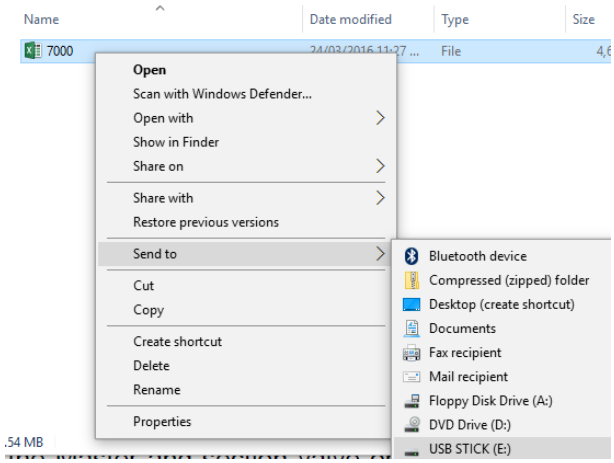


5. In most cases, the file will be downloaded to your DOWNLOADS folder on your windows PC. This can be found by opening your Windows Explorer and navigating to this folder.
6. Right Click the 7000.zip folder and select EXTRACT ALL. Follow the prompts.



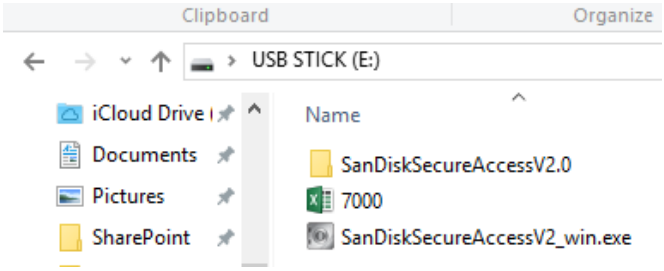
7. The window will now show the extracted 7000 file, and a new folder called 7000

8. Open the 7000 folder to reveal the 7000 File.
9. Right click on this and select SEND TO > USB (or it might simply be the drive letter of the USB)



   a. Alternatively, you may simply COPY & PASTE the above file direct onto your USB stick.

10. Navigate to your USB stick and confirm the 7000 file has copied over correctly.



11. Eject the USB stick safely and insert into the USB socket on the AC-7000 cable at the rear of the 7000 unit
12. **BACKUP** your existing settings. Refer to page XX
13. Once the USB stick is inserted, Select **UPDATE > BEGIN UPDATE**
14. The update will search the USB drive for the 7000 file and proceed with the update.
    a. The following Status bar reveals the following if the upgrade does not work
        i. 10% - Internal system error – retry – fails again restart
        ii. 20% - No USB detected – re-plug in – happens again – restart 7000
        iii. 30% - Copy failed – instructions not followed – try again. OR change USB brand
        iv. 60% - Update settings failed – retry update
        v. 70% - Old version clearing failed – retry update
        vi. 80% - Update naming failed – retry update
15. If the unit completes to 100%, the update has been successful, and the unit will reboot. Any problems regarding the above upgrade should be directed to a Smart AG Systems team member for assistance.

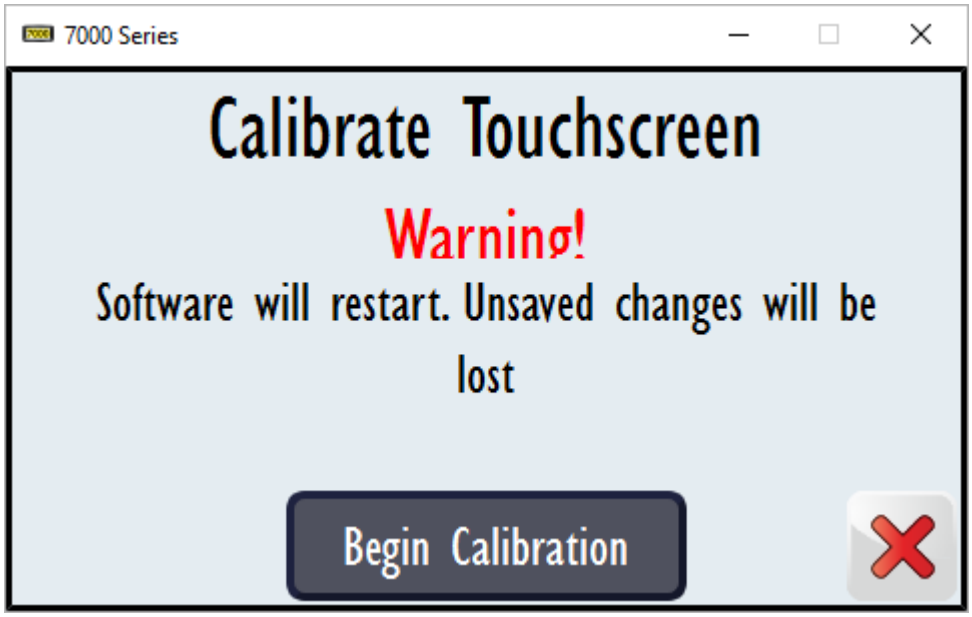
Note: Some USB drives may not work with the 7000 device. Known tested USB drives include Sandisk, Kingston, Toshiba, Strontium. Please do not use Lexar Jumpdrives.

Do not attempt this without advice from the Smart AG Systems service department.

Screen calibration

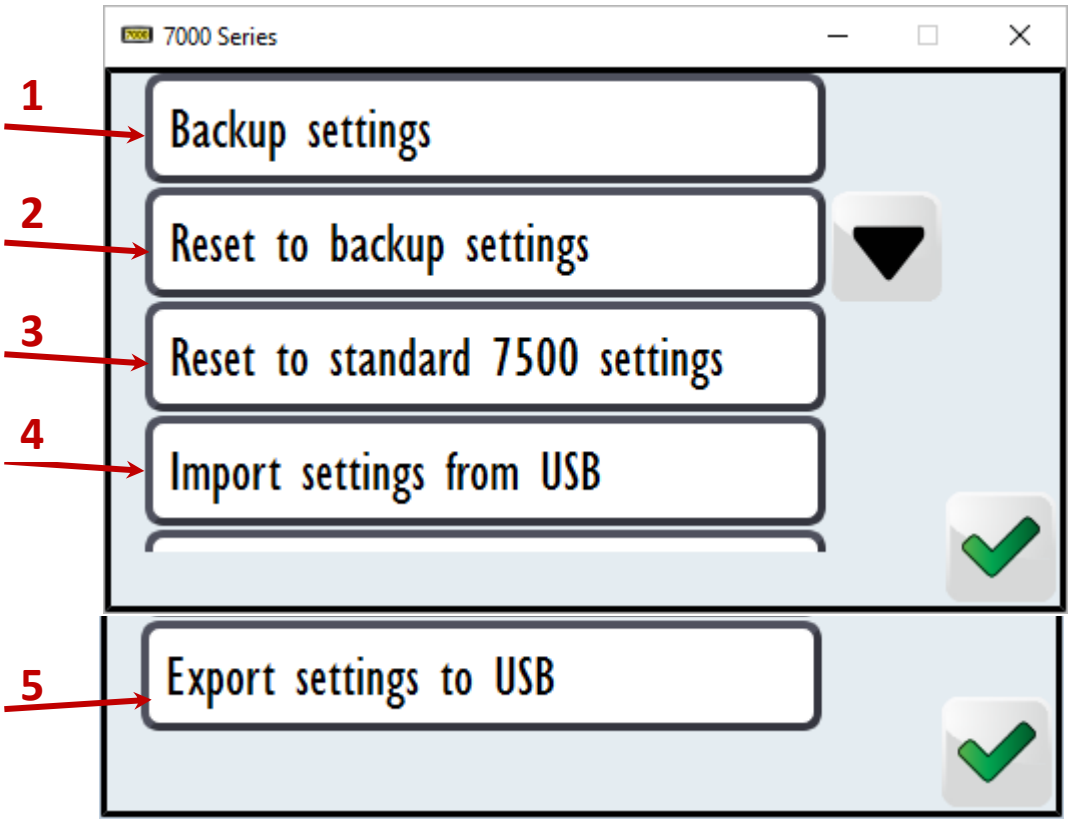
The **SCREEN** button lets the user calibrate the touch screen.

1. Follow the prompts as indicated.
   WARNING: Calibrating the touch screen requires the 7000 series software to be restarted upon completion.



Reset

The **RESET** button provides the following functionality:



1. **Backup settings**
    a. Once you are happy with the setup of the 7000, you can create a "settings file" of the device. This will allow you to recall a DEFAULT setup if something were to happen to your settings. By pressing this button, the backup file is stored on the device only.

2. **Reset to backup settings**
    a. Reloads the settings file that was created in step 1.

3. **Reset to standard 7500 settings**
    2. Returns the unit to Smart AG Systems default settings.
    WARNING: All settings, layouts, calibrations will be lost – everything.

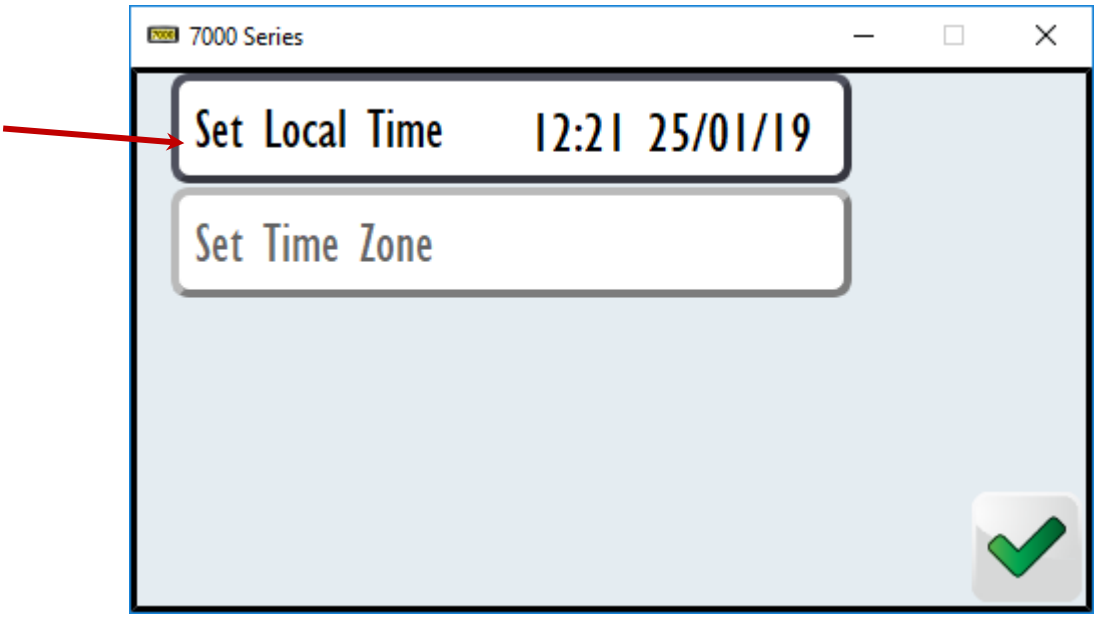
4. **Import settings from USB**
    a. You can restore the BIN file (settings) of the 7500. This contains the calibrations and complete setup. (Refer steps below)
    b. Insert a USB drive into the AC-7000 cable and follow the prompts.

5. **Export settings to USB**
    a. You can back up the BIN file (settings) of the 7500. This contains the calibrations and complete setup. (Refer steps above)
    b. Insert a USB drive into the AC-7000 cable and follow the prompts.

Time

The **TIME** button allows you to update the Date & Time according to your time zone.

1. Change to your local time as required.
2. Select the green **Tick** button.



Lang (Language)

1. The **LANG** button allows you to change the language used.
2. Select local language as required.
3. Select the green **Tick** button.

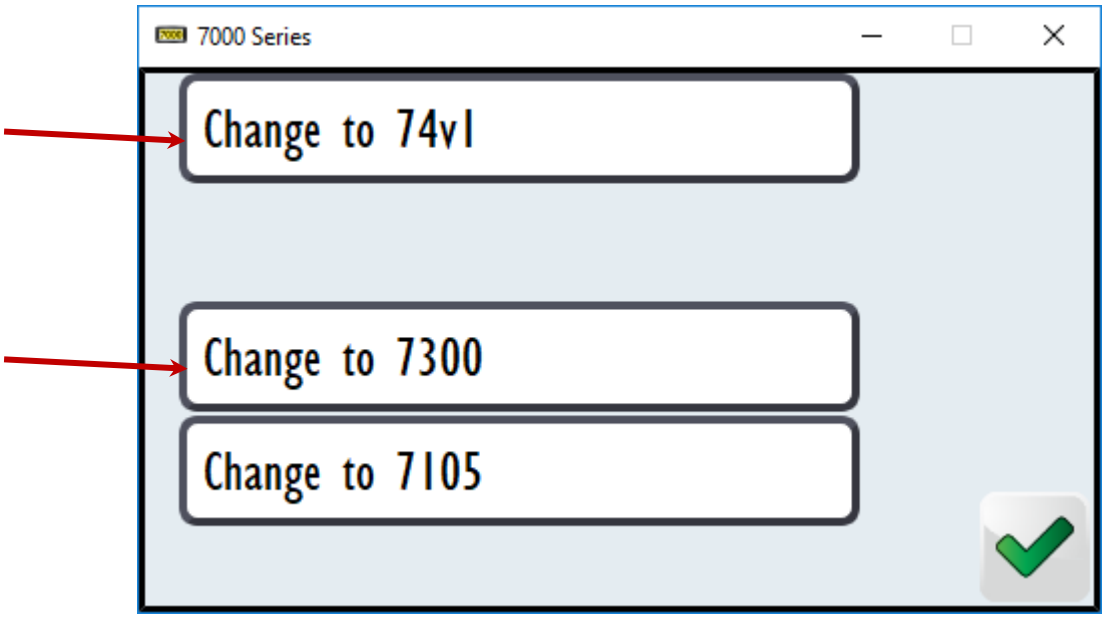
(The device will be restarted after new language is selected)

Model (SWAP MODEL)

1. The model button allows you to change from a 7500 Seed Rate Controller to a 7300 Spreader Controller or 74V1 Spray Controller if you have purchased the necessary unlock codes and hardware to suit.

2. All settings should be Backed Up to both device and USB stick. (Refer to previous guide)

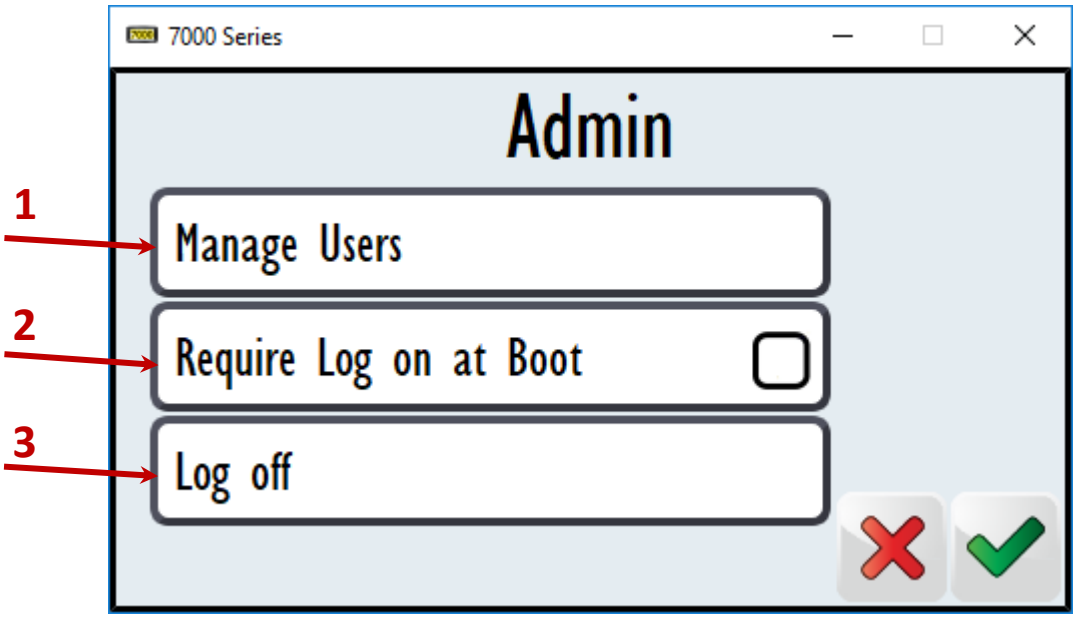
3. Contact Smart AG Systems for more information on this feature.



MAINTENANCE > USERS (4-2)

The 7000 has the ability to lock out certain features by creating users and assigning permissions.

If users are created, they will be displayed if you choose to export the job data to a CSV file later on down the track and then into other farm management software.

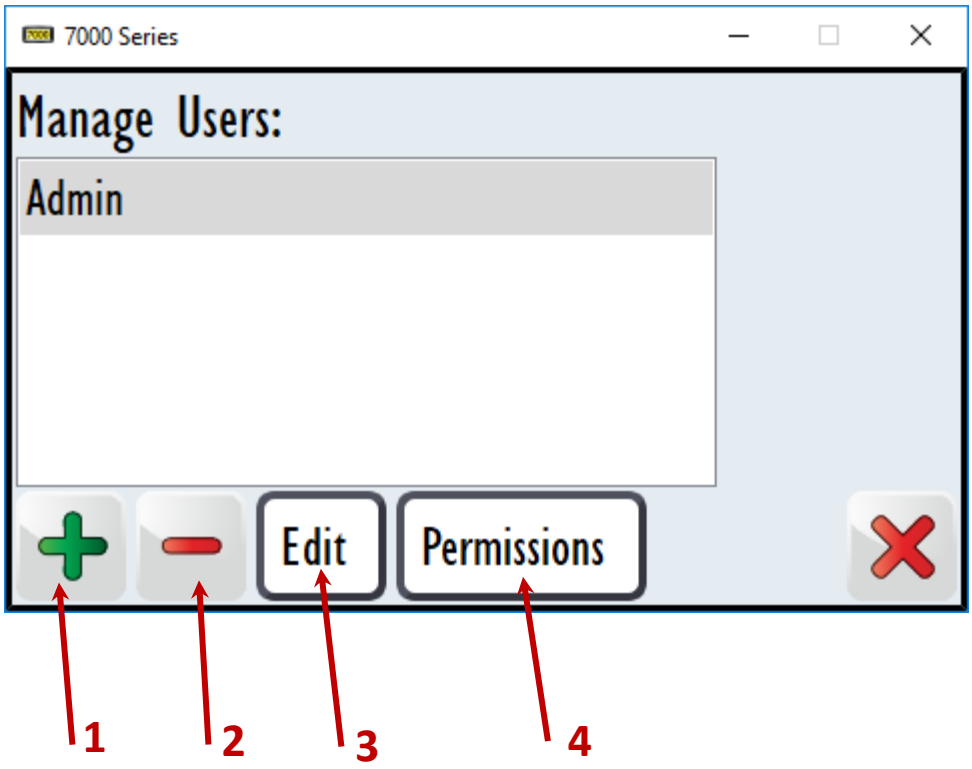


1. **Manage Users**
    a. Allows an administrator to add, remove, edit & give permissions to each user on the 7000.

2. **Require Log on at Boot**
    a. If this box is ticked, upon startup of the 7000 device the user will be required to select their username and enter a password to continuing using the 7000.

3. **Log off**
    a. When any changes are made by an administrator, selecting **Log off** will reboot the 7000 and return to the **Login** screen for the user to select their name and enter their password.

Manager users (4-2-1)

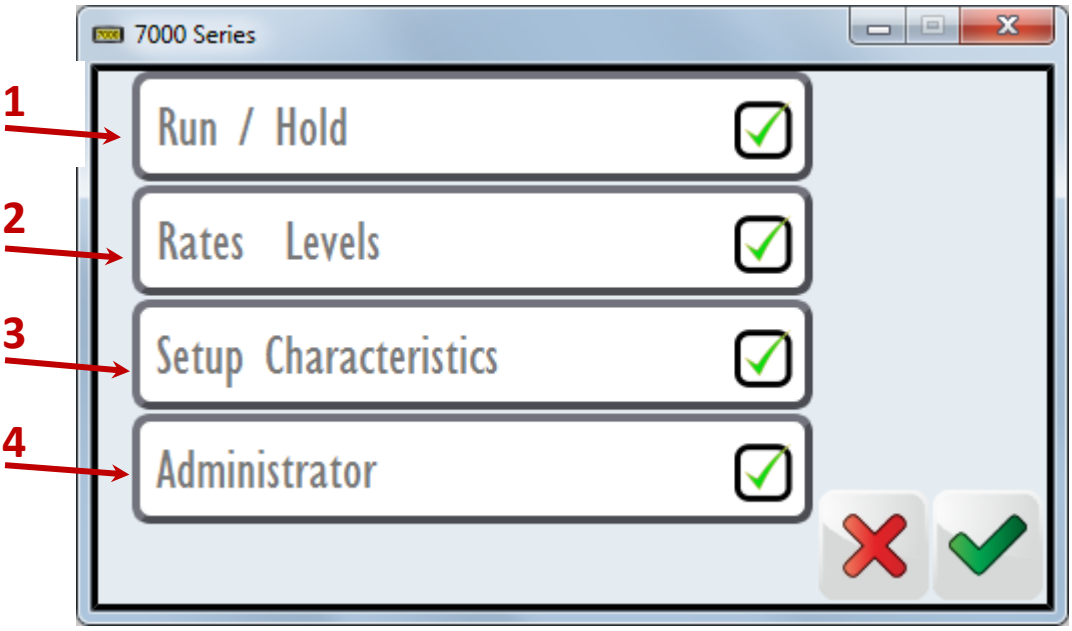


1. **Select the + button to ADD a new user.**
    a. Enter a username : e.g. John.
    b. Enter a password : e.g. West. **NOTE:** Passwords are case sensitive, so be careful with uppercase and lowercase.

2. **Select the – button if you wish to REMOVE a user.**
    NOTE: You will need to be logged in as an administrator to do this. If you are not an administrator, select **Log off** in the previous screen and enter your password to make any changes.

3. **Select the Edit button if you wish to change a username or password of the selected user.**
    NOTE: You will need to be logged in as an administrator to do this. If you are not an administrator, select **Log off** in the previous screen and enter your password to make any changes.

4. **Permissions**
    a. Select the **Permissions** button to allow or deny particular users certain fields they can or cannot change while using the 7000.



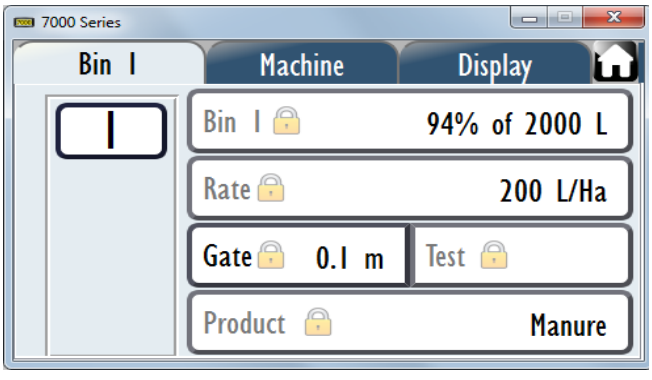
1. **Run/Hold**
    - Allows or denies the logged in user to manually select Run/ Hold if the tile is active from the **Front Screen**.
      NOTE: It is recommended that all users have Run/ Hold permission.

2. **Rates Levels**
    - Allows or denies the logged in user to adjust rates and reset bin/ tank levels.

3. **Setup Characteristics**
    - Allows or denies the logged in user to change working widths, calibrations, screens, etc.

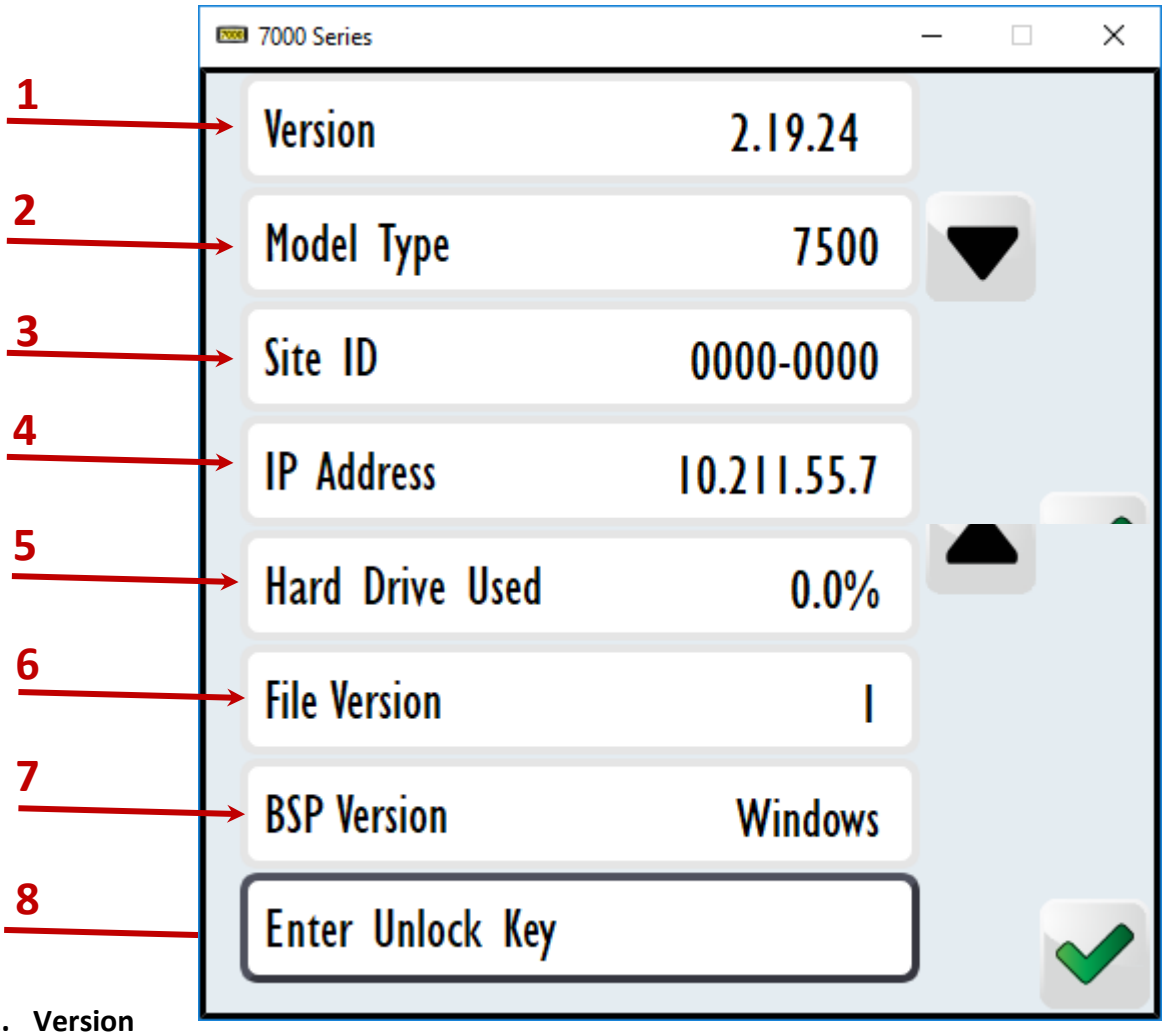
4. **Administrator**
    - Allows or denies the logged in user to have complete administrator rights with no restrictions in place.

      Examples of restricted fields that need permissions to be changed are shown below:



MAINTENANCE > ABOUT (4-3)

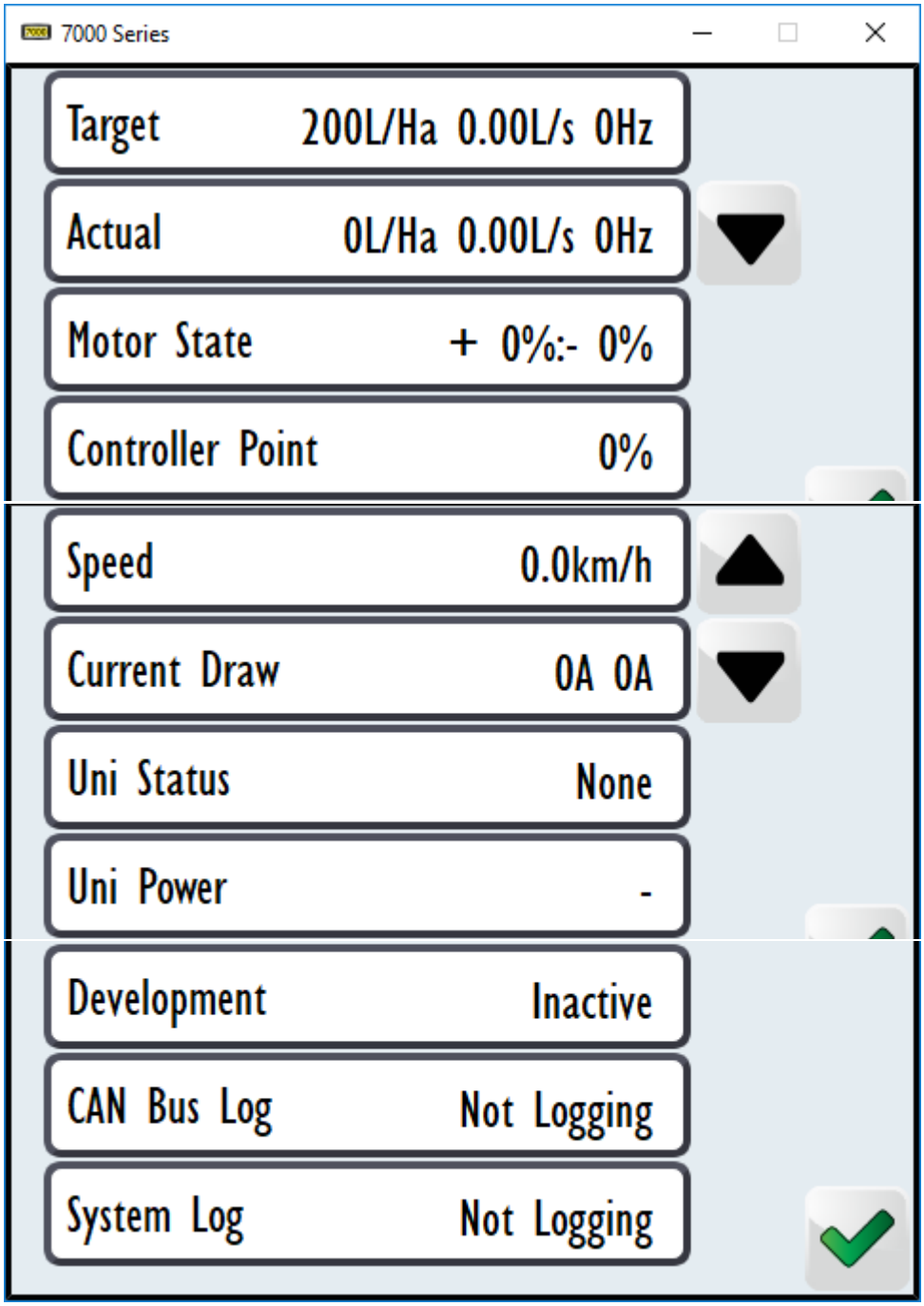
The **About** menu provides an overview of the software installed, version & build number and unlock codes installed. You may be directed to this screen by a Smart AG Systems technician for diagnostic purposes.



1. **Version**
    a. Displays version of software installed on the 7000.
2. **Model Type**
    a. Displays model version, if applicable.
3. **Site ID**
    a. Displays the site ID used to create an unlock code.
4. **IP Address**
    a. Displays the IP address of the 7000 display when connected to a network
5. **Hard Drive Used**
    a. Displays disk space that has been used (Related to Coverage
6. **File Version**
    a. Displays file version of the Unit, if applicable.
7. **BSP Version**
    a. Displays the base code version of the Unit, if applicable.
8. **Enter Unlock Key**
    a. Enter the unlock key when directed to unlock further features on the 7000.
    b. Follow the onscreen prompts.

MAINTENANCE > TEST (4-4)

The **Test** menu is used for diagnostic purposes only.

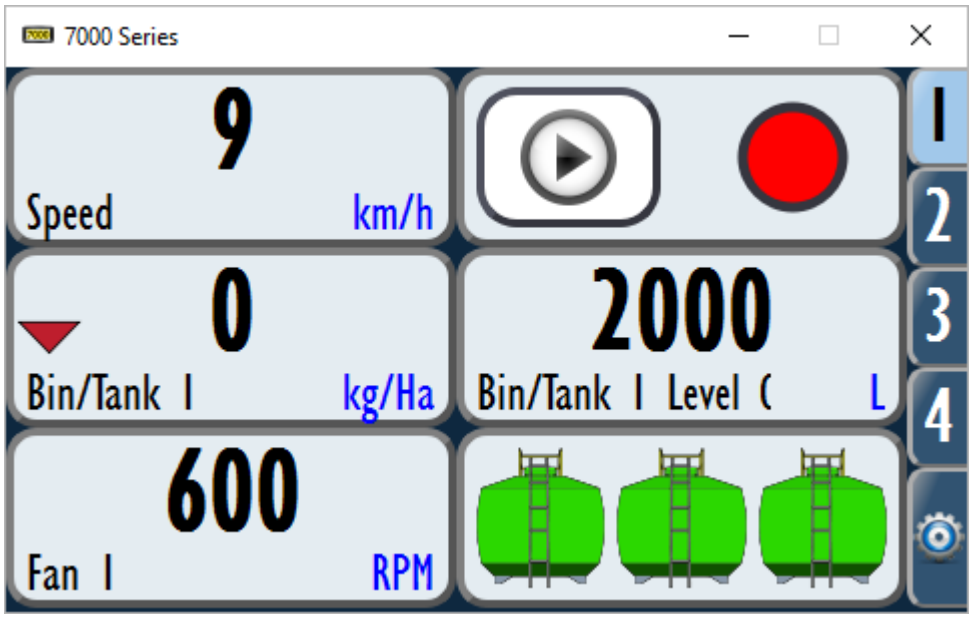


You may be directed to this screen by a Smart AG Systems technician for diagnostic purposes.

SCREEN & LAYOUT SETUP

Front screen | Tiles

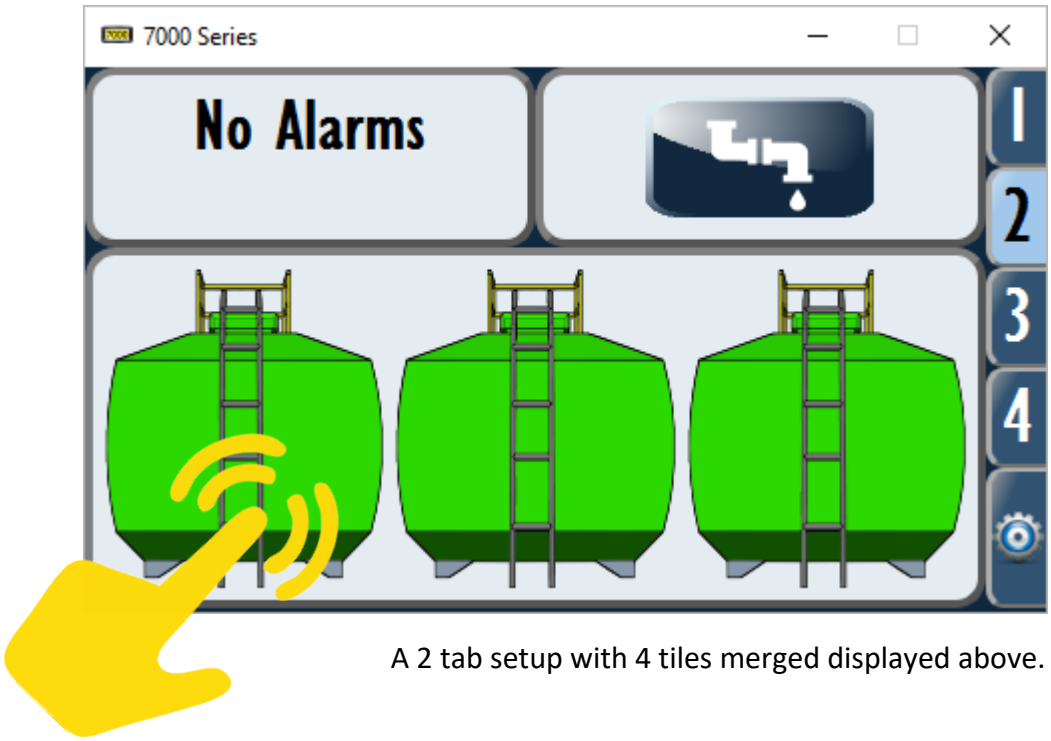
Front Screen tiles can be used to display any of the values being recorded or calculated by the system; these include but aren't limited to speed, pressure, rate, tank, etc.



A 3 tab setup with 6 tiles is displayed above.

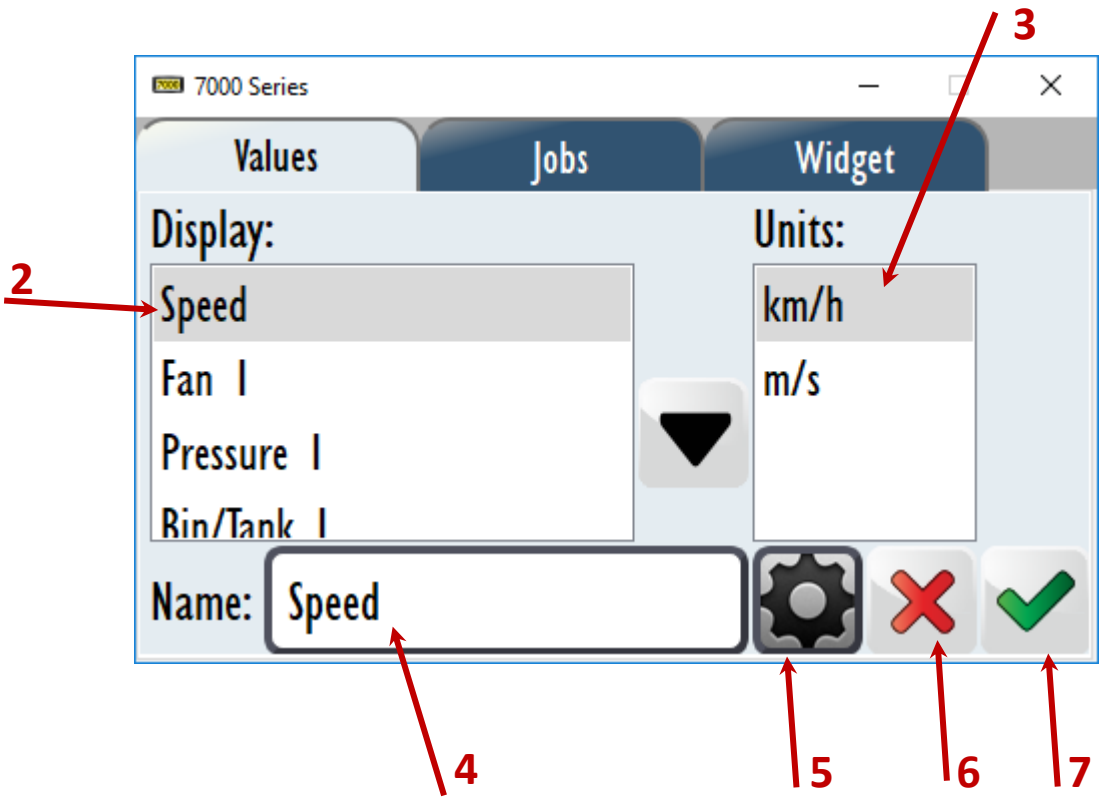
Change tile value

1. Hold a finger on the tile you desire to change for ~1 second and then release.



A 2 tab setup with 4 tiles merged displayed above.

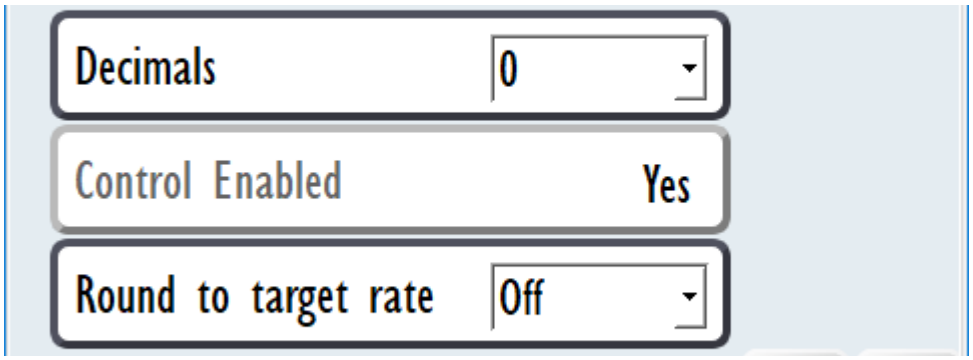
2. Select what value you wish to display from the display table below by Selecting on the value, the selected value will be highlighted. (Example below would be SPEED)



3. Once you have selected a value, select which units you want the value to be shown in from the units table; the selected unit will be highlighted.

4. Give the tile a custom name (if you like) by selecting the **Name** button and entering the name on the keyboard. Select the green **Tick** button once you are done.

5. Pressing the **Cog** button allows you to set how many decimal places to be displayed and the target point accuracy. **Control Enabled** (Yes/ No) is useful if you wish to display L/ha and L/m on two different tile. **NOTE:** Only ONE tile has the ability to control.



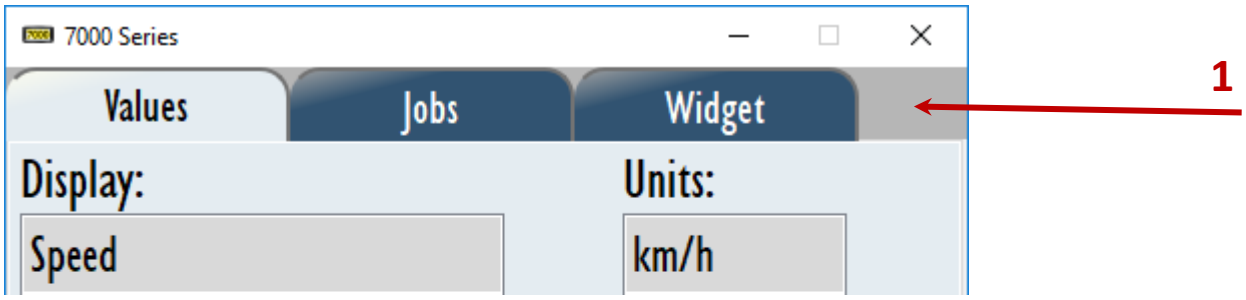
6. Select the green **Tick** button (7) to accept these changes and modify the tile or select the red **Cross** button (6) to cancel these changes.

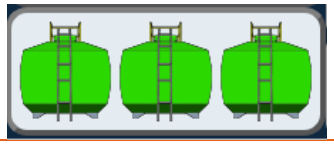
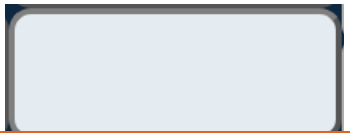
Widgets & other tab

Tiles can be used to display Widgets on individual devices or joined to multiple tiles for better layout and usage of each screen or tab.

To add an **Object** tile:

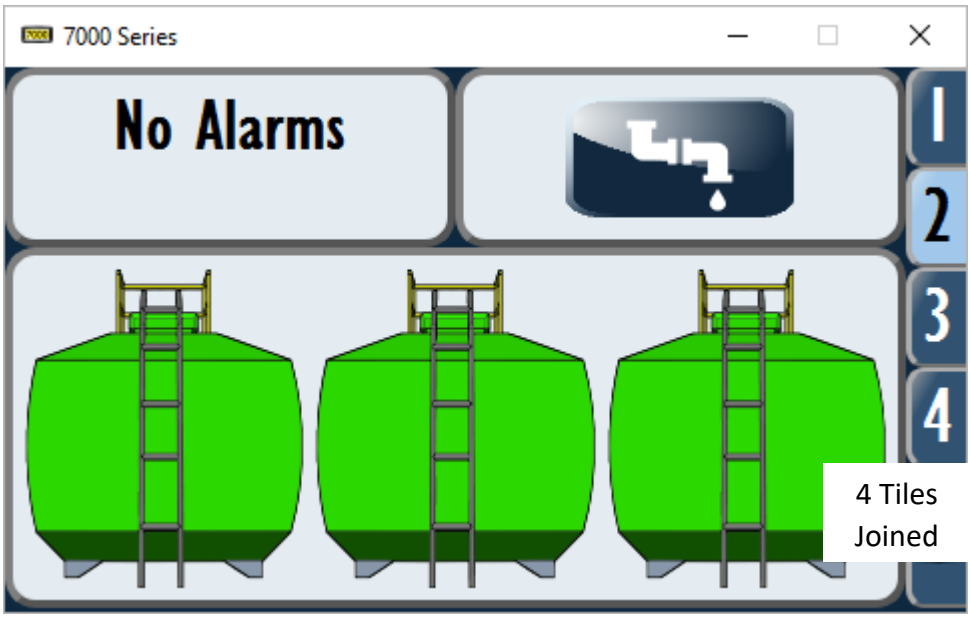
1. Hold a finger on the tile you desire to change for ~1 second and release (as described previously) then select **Other** (as in the example below).



Run/ Hold	**This is the MASTER Run/hold function. RED/ Play = OFF, GREEN/ STOP = ON.**	
Alarm Tile	**Displays instant Alarm Notifications for triggered alarms.**	
Flush/Prime Button	**Opens all metering systems at once if they are currently active (green)**	
Bin Controller	**Allows for quick On (Green)/ Off (Red) access to individual boom sections.**	
Blank Tile	**Allows for a blank tile on any page,**	

Merging tiles

Tiles can also be joined together (as seen below) to create bigger tiles for easier viewing of data.



A 3 tab setup with 6 tiles is displayed above.

In the example above, the 2 bottom tiles have both been selected to form a Bin Controller widget.

1. Change a tile to whatever display value and unit you want (follow previous section's guide).

2. Change the adjacent tiles to have the **same display value and unit.**
   NOTE: For adjacent tiles to join they must have the same display value and unit, the name and decimal points does not have to match.

3. Repeat step 2 to join up as many adjacent tiles as you wish.
   NOTE: Tiles can only be turned into rectangular or square shapes; they cannot be 'L' shaped.

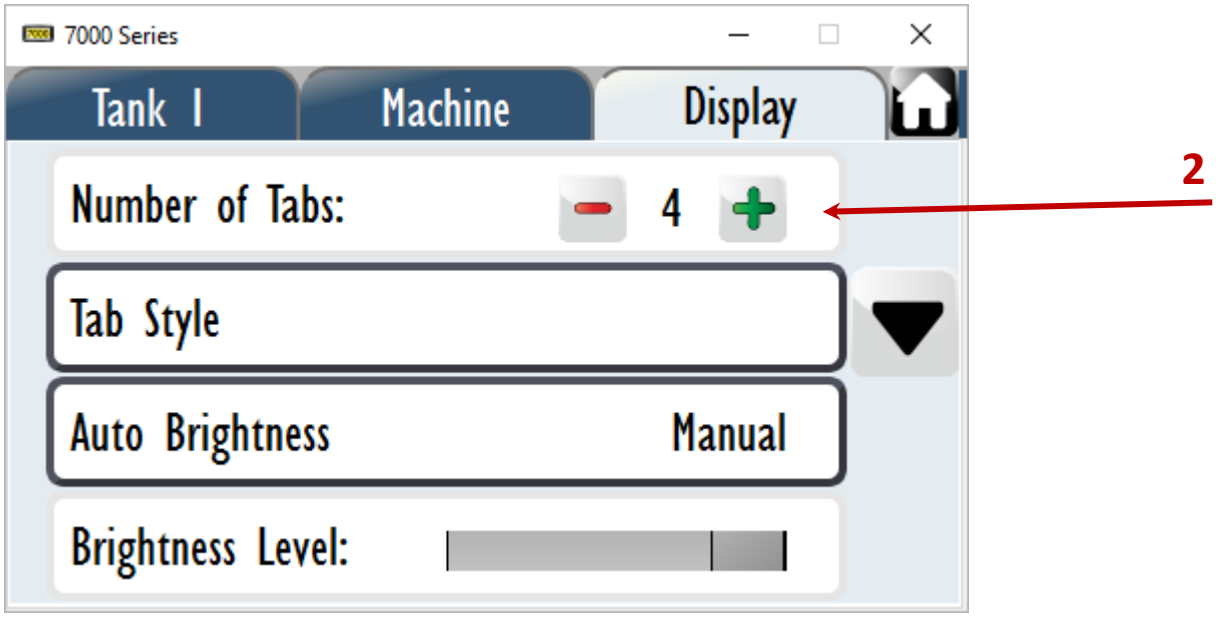
4. Change the name and decimal places of the bigger tile if you so wish.

DISPLAY

The **Front Screen** can have 1, 2, 3 or 4 tabs on it. Each tab can be set up individually to display different information.

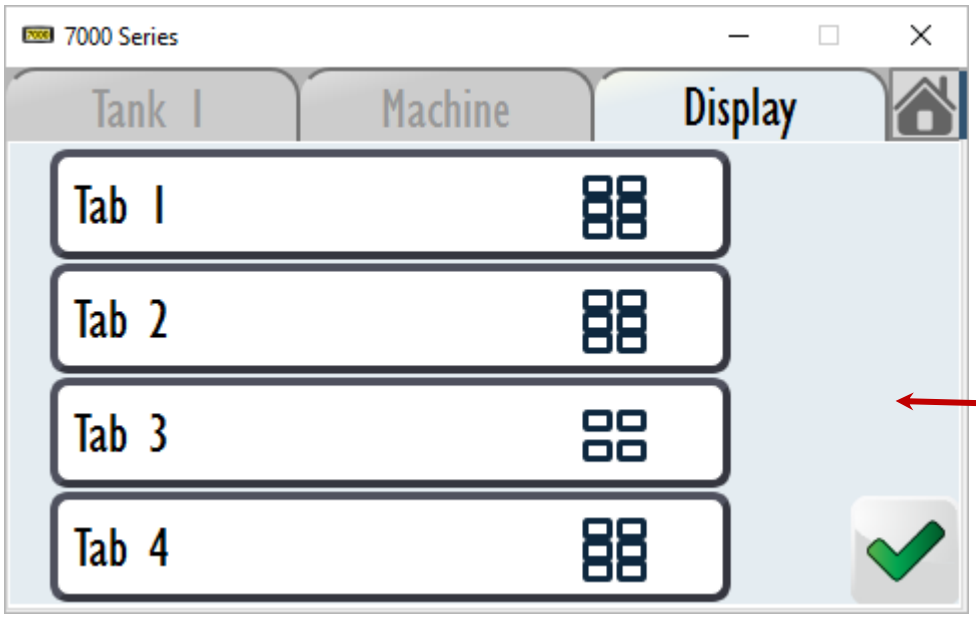
Tabs (Screens) & Tiles

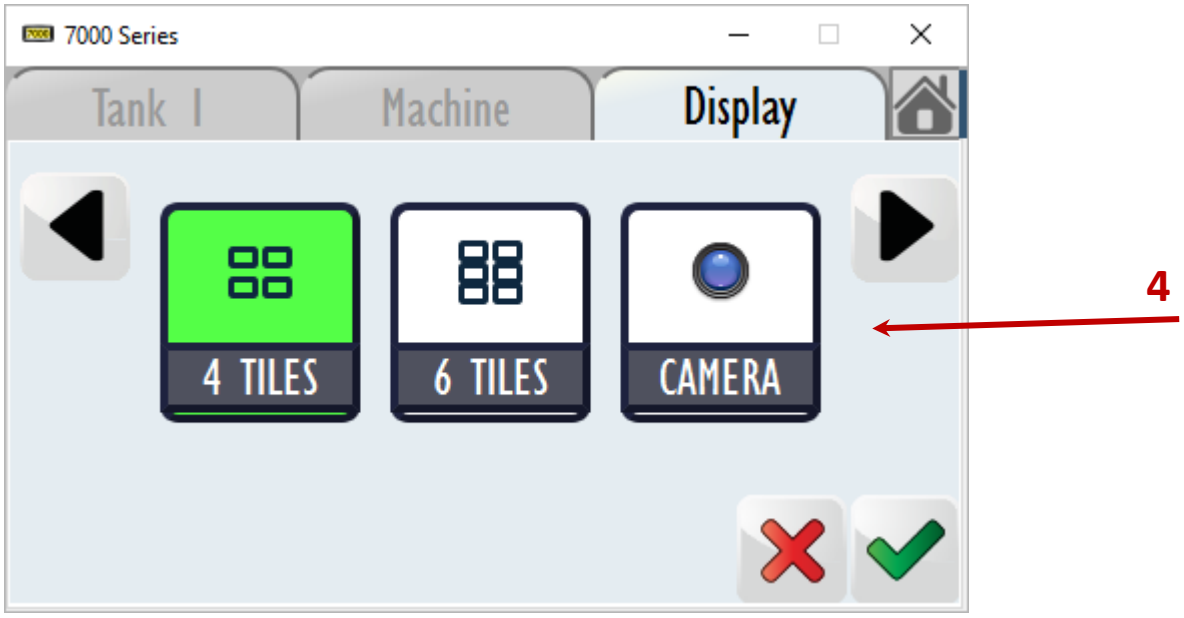
1. Navigate to the **Display** tab of the **Setup** menu



2. Select the **+** or **–** button for the **Number of Screens** option to change the number of **Front Screen** tabs. **WARNING**: If you remove a tab then any configured tiles will be lost.

1. Navigate to the **Display** tab of the **Setup** menu **(Settings > Setup > Display).**
2. Select the **Screen Style** button.
3. Select which screen (Screen 1/2/3/4) you wish to change and then select that button.
4. Select what screen tile layout or screen configuration you want (e.g. 4 tiles, camera, etc.).





5. Select the green **Tick** button.
   WARNING: If you change a tab screen layout then any display configurations for it will be lost.
6. Select **OK** on the **Warning** screen.
   WARNING: If you change a tab screen layout then any display configurations for it will be lost.
7. Once you have finished changing the screen layouts select the green **Tick** button to exit the **Setup** menu.

Screen brightness (Auto or manual)

The brightness of the display screen can be adjusted automatically or by the user.

1. Navigate to the **Display** tab of the **Setup** menu.

2. Adjust the **Brightness** slider to the left to decrease brightness or adjust the slider to the right to increase brightness.

If you prefer, the 7000 has its own brightness indicator to automatically adjust the brightness when external conditions change. This can be changed to **Automatic** or **Manual**

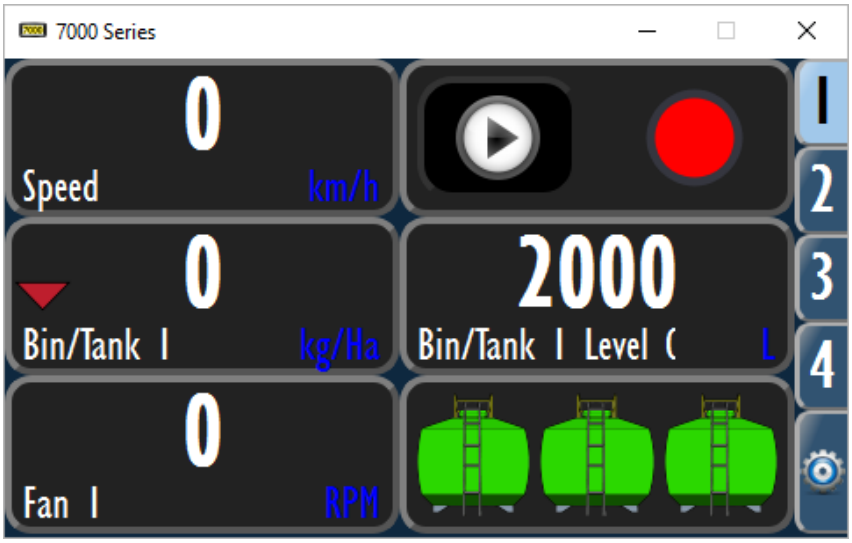
Unit type

The unit type allows the user to choose **Metric** or **Imperial**.

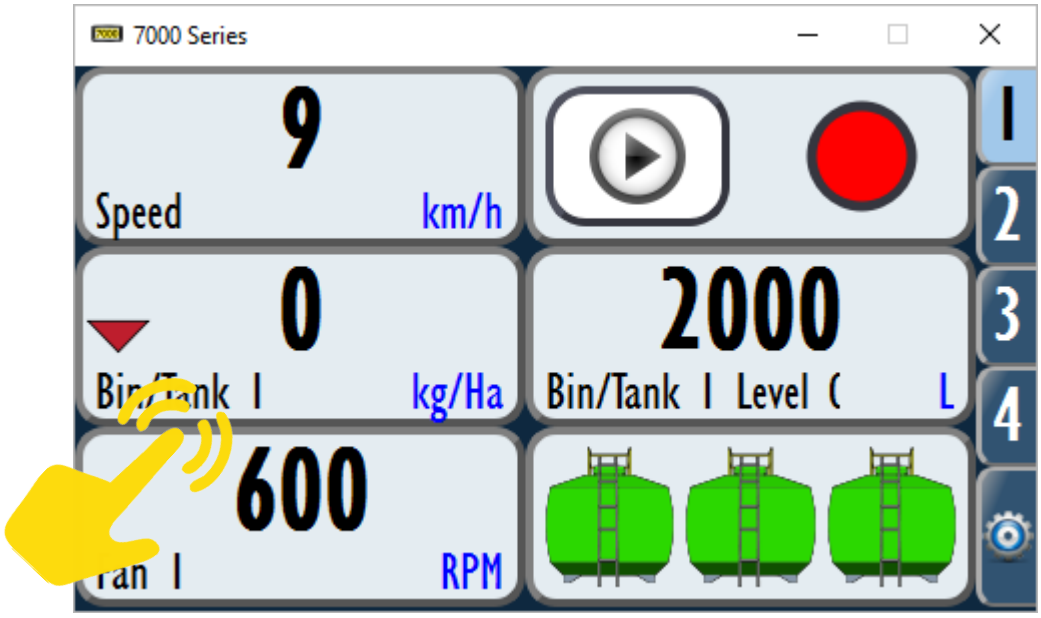
Day/Night mode

This changes the display view of the 7000 for night time or daytime viewing as below.

WARNING: The 7000 will restart.



Front screen control (bin widget)



To set up **Bin Widget** on the **Front Screen** tiles, follow these steps

1. Hold a finger on the tile you desire to turn into **Bin Widget** for ~1 second and release.
2. Select the **Other** tab.
3. Select **Bin Controller** from the list.
4. Select the green **Tick** button.

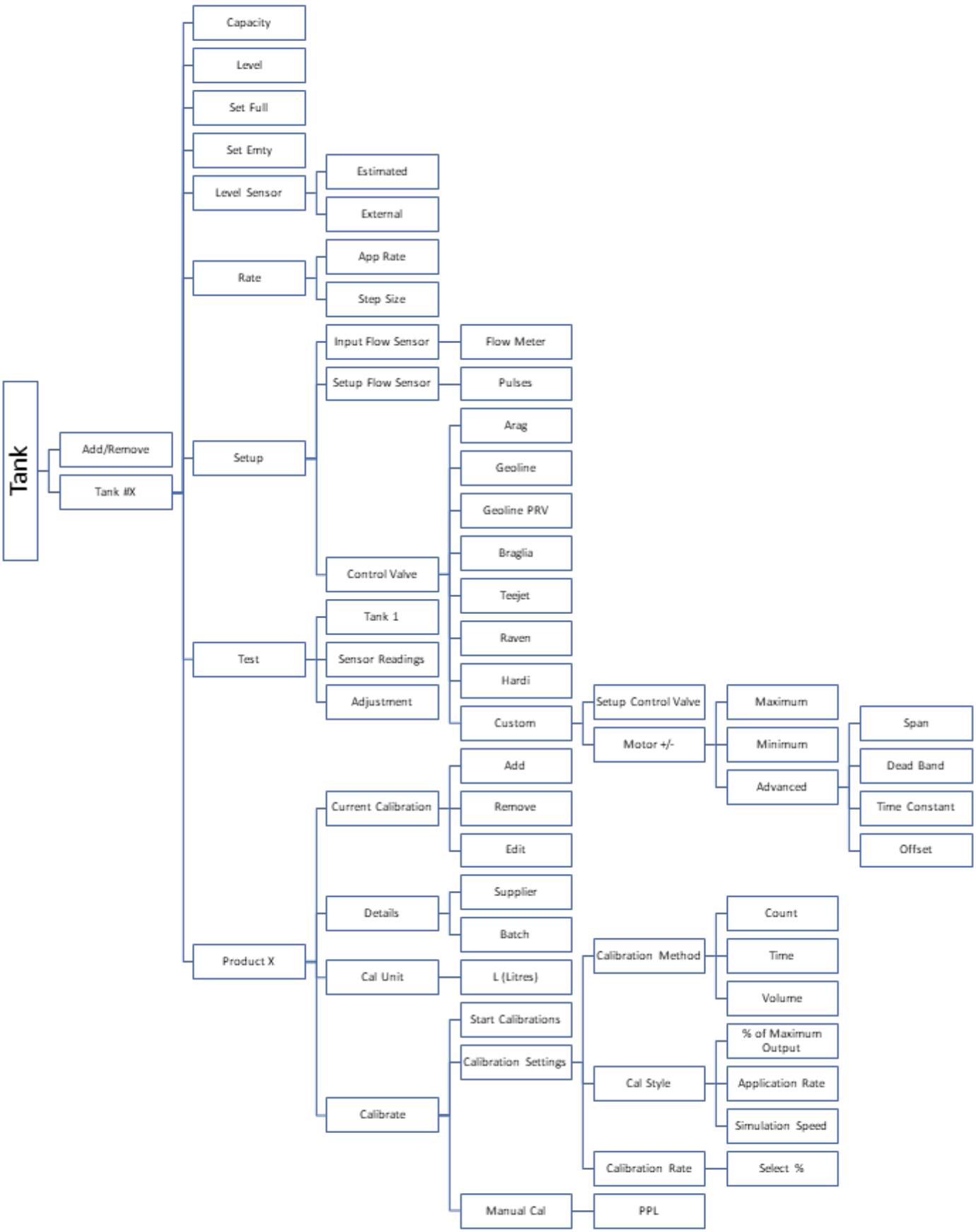
NOTE: Bin Controller tiles can be joined together to make them bigger just like any other tile; this will make it easier to operate if the optional switch box is not installed.

Front screen control (application rate)

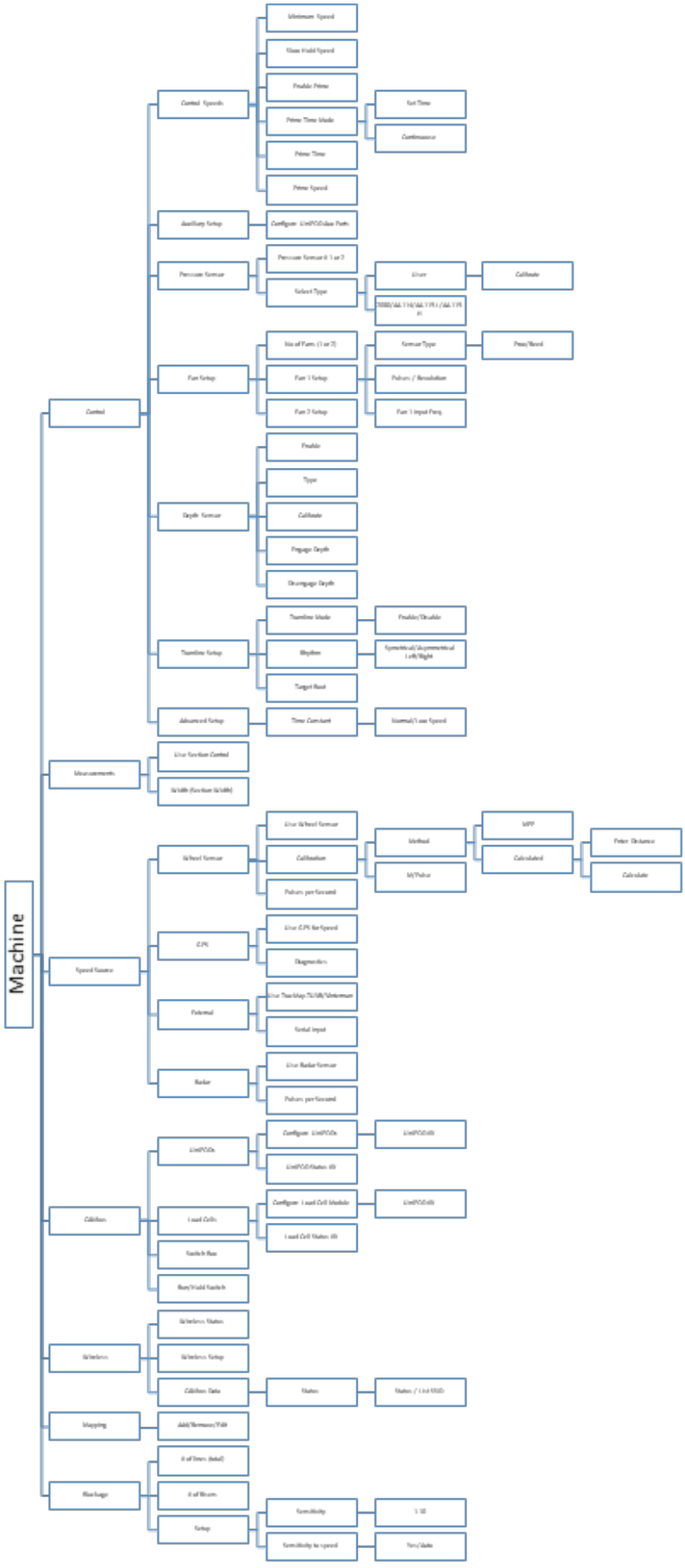
If there is no **Front Screen** tile showing the value for **Tank X Rate** (where X is the number of the tank you wish to adjust) then create a tile showing this value (follow directions for setting up **Front Screen** tiles).

1. Select the **Front Screen** tab that contains the **Tank X Rate** tile (where X is the number of the tank you wish to adjust).
2. Select the tile which will now show the desired application rate for the tank.
3. Select the **+** button to increment the desired application rate by the desired application rate step (**Step Size** option).
4. Select the **–** button to decrement the desired application rate by the desired application rate step (**Step Size** option).
5. Select the tile again to return it to its normal state.

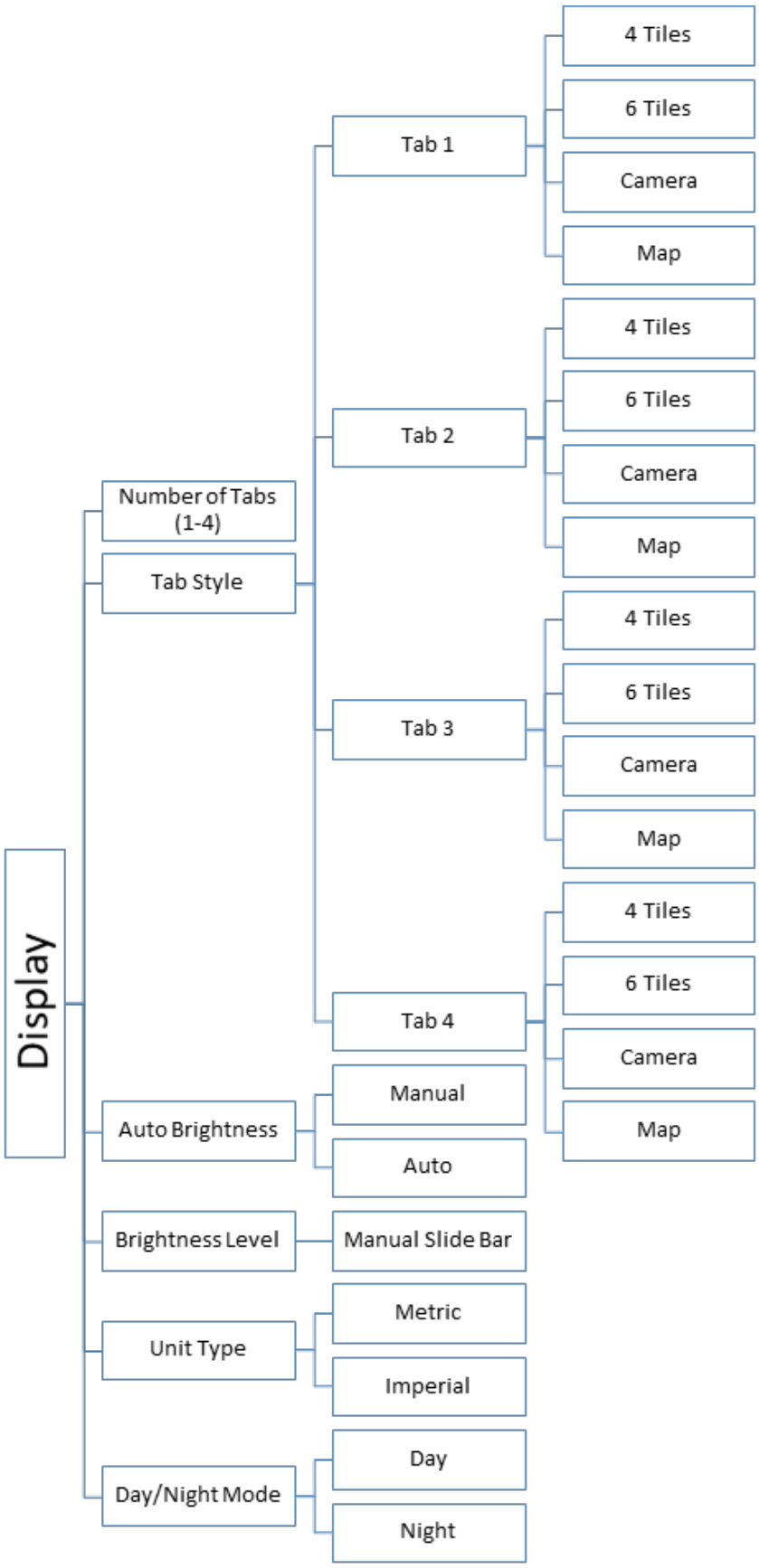
7500 MENU LAYOUT (TANK)



7500 MENU LAYOUT (MACHINE)



7500 MENU LAYOUT (DISPLAY)



Notes