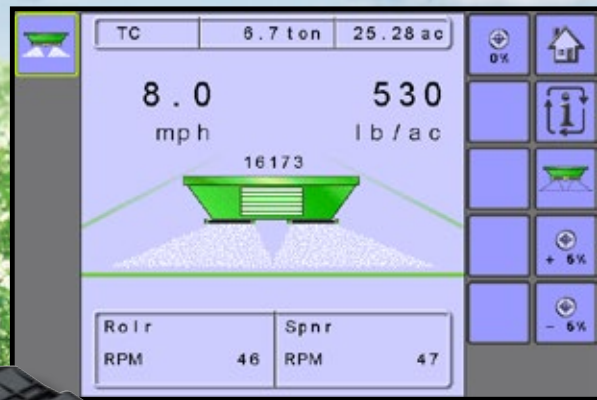


IC18 SPREADER JOB COMPUTER USER MANUAL



Software version 1.10
North America



A Subsidiary of  Spraying Systems Co.®

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To ensure optimal use of the equipment, please read this manual thoroughly. Please contact TeeJet Technologies Customer Support or an authorized TeeJet Technologies dealer if additional support is required.

RESPONSIBILITY FOR USE OF THIS PRODUCT

Regarding responsibility for use of this product, we refer to our sales and delivery terms which states:

Product Usage

Any use of the product is at the sole risk of the buyer. The buyer is therefore not entitled to any form for compensation caused by, for example, any of the following:

- ▶ Disturbance to/from any electronic services or products that do not conform to the standards for CE marketing;
- ▶ Missing or poor signal coverage or a succession hereof from external transmitters/receivers used by the buyer; Functional faults which apply to or from a PC-program or PC equipment not delivered by the seller;
- ▶ Faults that may arise from the buyers' negligence to react to warnings and fault messages from the product or that can be traced to negligence and/or absent constant control of the work carried out in comparison to the planned job.

When implementing any new equipment the buyer must take great care and pay attention. Any doubts as to the correct operation/use should result in contacting the seller's service department.

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CHAPTER 1– INTRODUCTION

Congratulations on the purchase of your new IC18 Spreader ECU built on the ISOBUS architecture. When used within the guidelines of the this manual, the IC18 Spreader controller will be a reliable application tool.

Use with your existing Universal Terminal (UT) for dry product application

Product Benefits:

- Works seamlessly and displays on any ISOBUS UT.
- Easy navigation menu and data rich display.
- Add additional ISOBUS ECUs as your needs change.
- Provides basic rate control or variable rate if the connecting UT has variable rate task control capabilities.
- Standardized plugs, cables and software simplify installation and connectivity and result in true “plug and play” technology. IC18 Spreader ECU resides on the implement, reducing hardware in the cab.

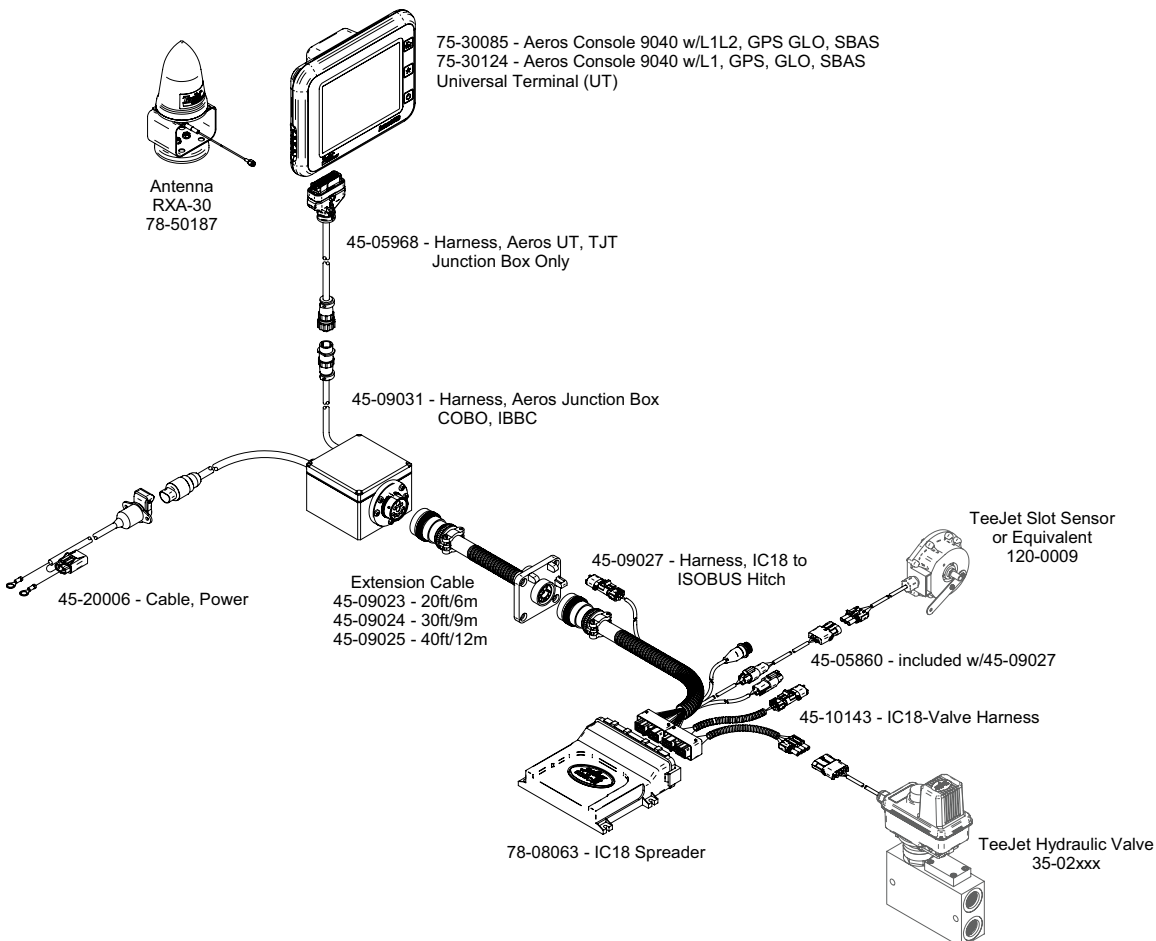
Figure 1-1: IC18 Job Computer



CONFIGURATIONS

The following diagram is reflective of typical a IC18 Job Computer configuration. Due to the variety of possible configurations, this should be used for reference purposes only.



Figure 1-2: IC18 Spreader to Universal Terminal (UT)



ISOBUS Job Computer: IC18 Spreader

START UP

Power is continuously supplied to the job computer. The Universal Terminal (UT) will give access to the job computer options and operation.

- A firm touch is required when selecting a screen icon.
- Settings are NOT automatically saved when selected. The ACCEPT KEY  must be selected to save the setting. Select the ESCAPE KEY  to escape without saving settings and return to the previous menu.
- The console needs to be cycled off and back on when changing or attaching equipment to the system.

NOTE: The menu structure on your display might vary from the one displayed in this user manual depending on the Universal Terminal (UT) being used.

PROGRAM MODE

The IC18 job computer is programmed to calculate calibrations based on North American or European methods.

- ◀ North America – Gate Height is calculated into the product application and calibrations will be based on Pulses Per Volume.
- ◀ European – Gate Height is NOT calculated into the product application and calibrations will be based on Volume Per Pulse.

This setting has been established before leaving the factory, but it can be changed after purchase with assistance from TeeJet Technologies Customer Service or your local dealer through the OEM setup menu options.

Figure 1-3: North America

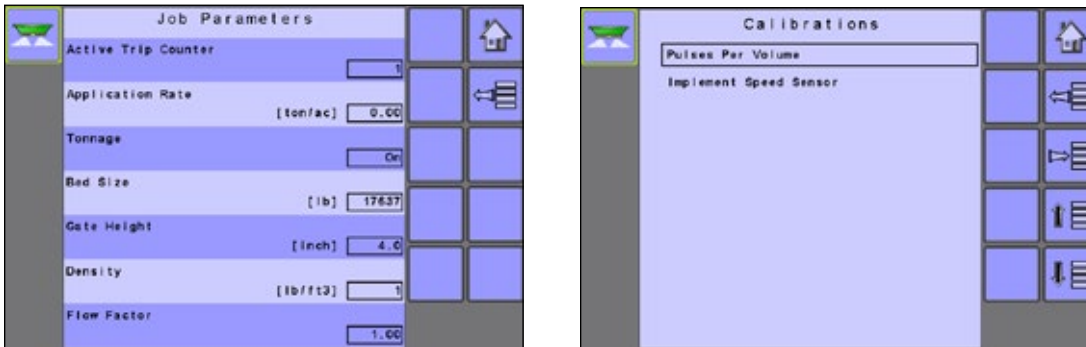


Figure 1-4: European



HOME SCREEN

The Home Screen gives access to the IC18's available functions. Power is continuously supplied to the job computer. The universal terminal will give access to the job computer options and operation.

NOTE: Information on the ECU will vary depending on the parameters set by the user and the OEM.

Figure 1-5: Home Screen



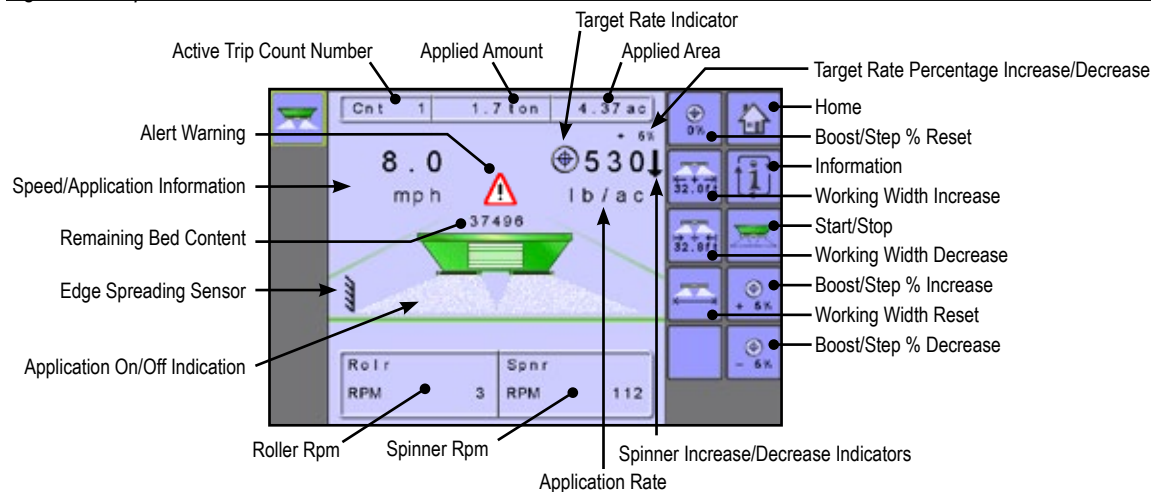
Table 1-1: Home Screen Functions and Descriptions

Function	Description
Available ECUs (image varies depending on systems available)	Systems currently available on your UT are displayed in the left hand column of every page. To navigate between systems simply press the icon to open the desired system
Operation Mode	Accesses the Operation screen of the IC18 Spreader including application control, rate control and trip/count/application information
Filling Shortcut	Accesses the Filling screen to establish the amount of material remaining in the bed
Main Setup Mode	Menu to input various spreader settings
Transport Mode	Locks all spreading and hydraulic functions to prevent accidents.
Fast Empty Bed Shortcut	Allows the user to empty the bed of its contents without having the spinners on
Application Rate Shortcut	Accesses calibration of the active flow factor
Quick View	Information displayed is based on the Current Active Trip

OPERATION MODE SCREEN

Information on the Operation screen will vary depending on the parameters set by the user and the OEM.

Figure 1-6: Operation Screen

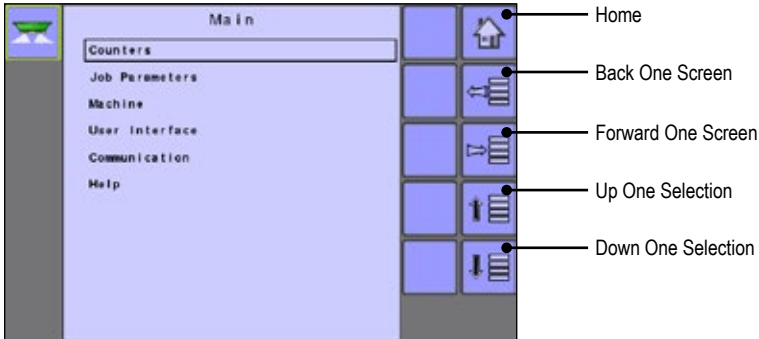


ISOBUS Job Computer: IC18 Spreader

MAIN SETUP SCREEN

The main setup menu contains six (6) options. Each of these options either directly access settings or additional menus.

Figure 1-7: Main Setup Screen



The table below outlines the additional menus and directs you to the setup pages for further information.

MAIN SETUP MODE MENU STRUCTURE

Counters	Job Parameters	Machine	User Interface	Communications	Help
▶ Trip		▶ *Filling			▶ Diagnostic
▶ Campaign		▶ Operation			▶ About
▶ Total		▼ Implement Parameters			▶ Factory Settings
▶ Export		▼ Calibrations			
		▶ *Application Rate			
		▶ *Pulses Per Volume			
		▶ *Volume Per Pulse			
		▶ *Amount Per Pulse			
		▶ *Hydraulic System			
		▶ Implement Speed Sensor			
		▶ *Weighing System			
		▶ Alarm Configurations			
		▶ OEM			
		▶ Sensors			
		▶ Actuators			
		▶ User Interface			
		▶ Regulator Configuration			
		▶ Calibration RPM			
		▶ Program Modes			
		▶ Reference Gate Height			
		▶ Delete Total Counters			
		▶ TC - Implement Settings			

The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

*Menu settings directly related to OEM equipment.

SETTINGS OPTIONS NAVIGATION

Figure 1-8: Enter Selection Screens

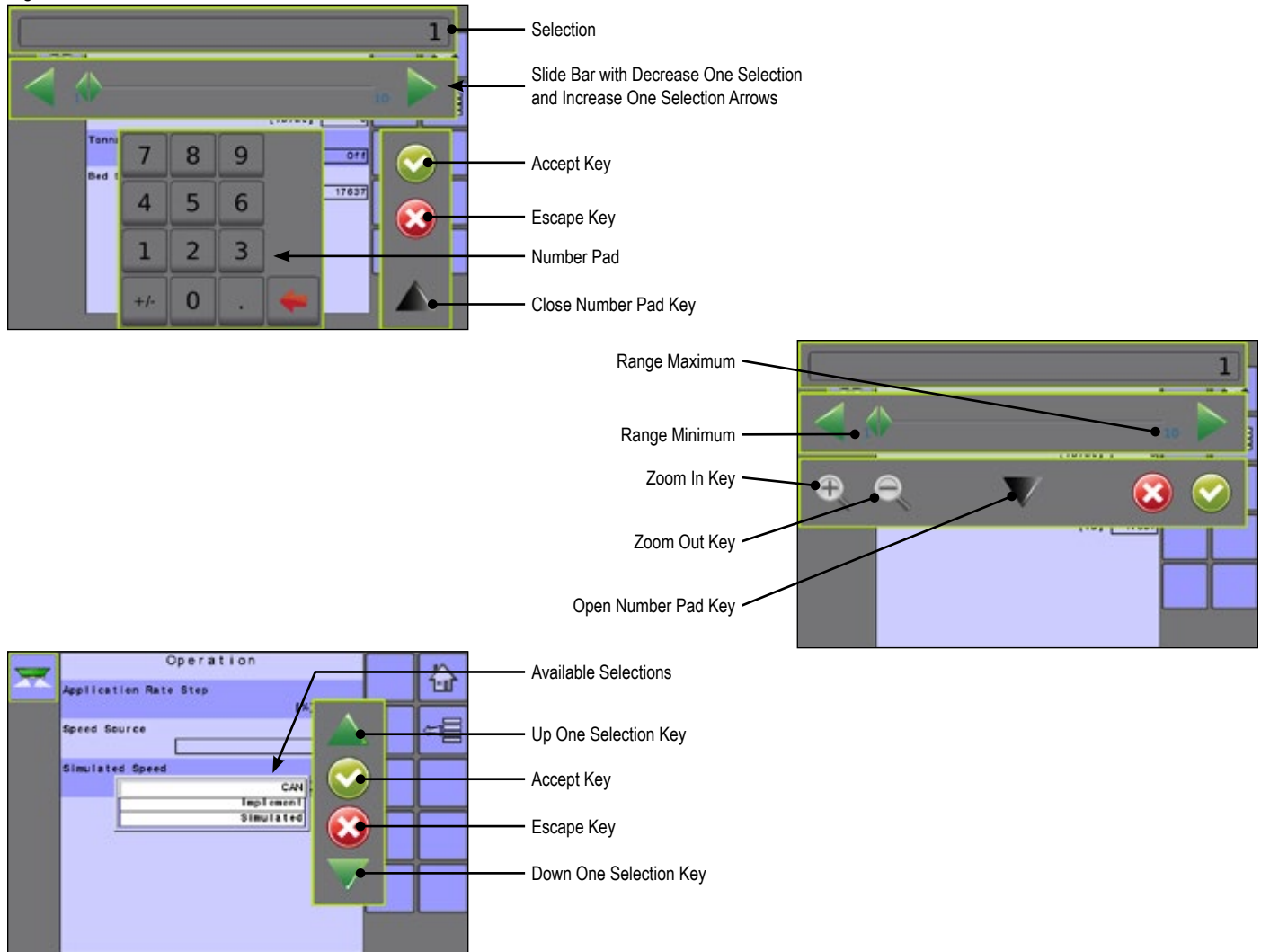


Table 1-2: Sections and Icon Descriptions

Section or Icon	Description	Section or Icon	Description
Selection	Displays the current or new selection	Open Number Pad Key ▼	Maximizes the number pad
Slide Bar	Selects the setting by pressing and releasing on the slide bar or pressing and dragging the Slider to a designated value. Range for a specific setting is displayed on the slide bar.	Close Number Pad Key ▲	Minimizes the number pad
Slider ◀▶	Slide to the left to decrease or right to increase the selection	Accept Key ✓	Accepts the new selection
Increase One Selection Arrow ▶	Increases the setting	Escape Key ✕	Escapes without saving changes
Decrease One Selection Arrow ◀	Decreases the setting	Up One Selection Arrow ▲	Highlights the selection above
Number Pad	Use the numbers to set the selection value	Down One Selection Arrow ▼	Highlights the selection below
		Zoom In Key 🔍	Narrows slide bar range. Gray = maximum zoom level.
		Zoom Out Key 🔍	Expands slide bar range. Gray = minimum zoom level.

ISOBUS Job Computer: IC18 Spreader

CHAPTER 2 – OPERATION MODE



The Operation Screen accesses the working aspects of the IC18 including boom section control, rate control and trip/count/application information.

NOTE: Settings are automatically saved when selected.

NOTE: The menu structure on your display might vary from the one displayed in this User Manual depending on the UT being used.

PROGRAM MODE

The IC18 job computer is programmed to calculate calibrations based on North American or European methods.

◀North America – Gate Height is calculated into the product application and calibrations will be based on pulses per volume.

◀European – Gate Height is NOT calculated into the product application and calibrations will be based on volume per pulse.

This setting has been established before leaving the factory, but it can be changed after purchase with assistance from TeeJet Technologies Customer Service or your local dealer through the OEM setup menu options.

OPERATION MODE OVERVIEW

Information on the Operation screen will vary depending on the parameters set by the user and the OEM.

Figure 2-1: Operation Mode Screen Overview

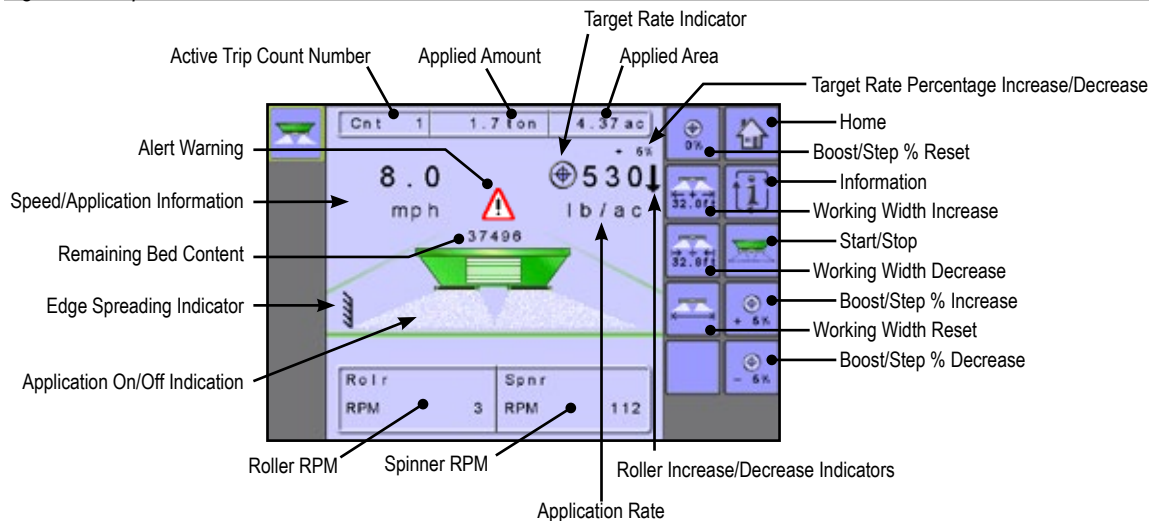


Table 2-1: Key/button Descriptions

Key/button	Description
Home	Press to return to the Home screen
Information	Press to toggle between display modes
Start/Stop	Press to start or stop spreader
Boost/Step Percentage Increase/Decrease	Press to establish the required boost percentage step, i.e. the step size, at which the application rate is to increase/decrease with the boost function <i>NOTE: Application rate step percentage can be defined under Main -> Machine -> Operation -> Application Rate Step.</i>
Boost/Step Percentage Reset	Press to return to target rate and reset the boost/step percentage to zero

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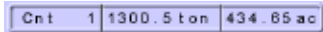

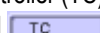








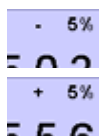





Key/button	Description
 Working Width Step Increase/Decrease	Press to increase or decrease the required working width. <i>NOTE: Working Width can be defined under Main -> Machine -> Implement Parameters -> Working Width</i>
 Working Width Reset	Press to cancel any changes made to the Working Width

Table 2-2: Section and Icon Descriptions

Section or Icon	Description
Active Trip Information	This information bar displays the active trip count number, applied amount and applied area 
Active Trip	Trip Mode – connected to an ISOBUS CAN with only a UT device found, the current active trip or job number will be displayed  Task Controller (TC) Mode – connected on an ISOBUS CAN with a TC device found, then TC will be displayed 
Applied Amount	Displays amount applied for the selected Active Trip Count Number
Applied Area	Displays applied area for the selected Active Trip Count Number
Speed/Application Information	Displays vehicle speed, amount applied per minute or RPM. The Information Key toggles  between display modes.
Remaining Bed Contents	Displays the remaining bed content <i>NOTE: If no bed sensor is fitted or the contents are not entered in the Filling Menu prior to spreading, Bed Contents will display “0”.</i> 
Application On/Off Indication	Displays if application is active  or inactive  .
Application Rate	Displays the actual application rate per hectare/acre <i>NOTE: When the Master is “On” the actual application rate per hectare/acre will be displayed. When the Master is “Off” the target rate is displayed and the TARGET RATE ICON  appears.</i>  
Roller Increase/Decrease Indicators	Indicates if the rollers need to increase or decrease to meet the target application rate at the current speed. 
Target Rate Percentage Increase/Decrease	Displays boost percentage step, i.e. the step size, at which the application rate is to increase/decrease with the boost function. 
Alarm Warning	Displayed if an alarm condition is active 
Roller RPM	Displays the RPM of the belt roller 
Spinner RPM	Displays the RPM of the spinner 
Work Width Meter	Displays the application distribution width 
Edge Spreading Sensor	Displays if Border Spreading is activated 

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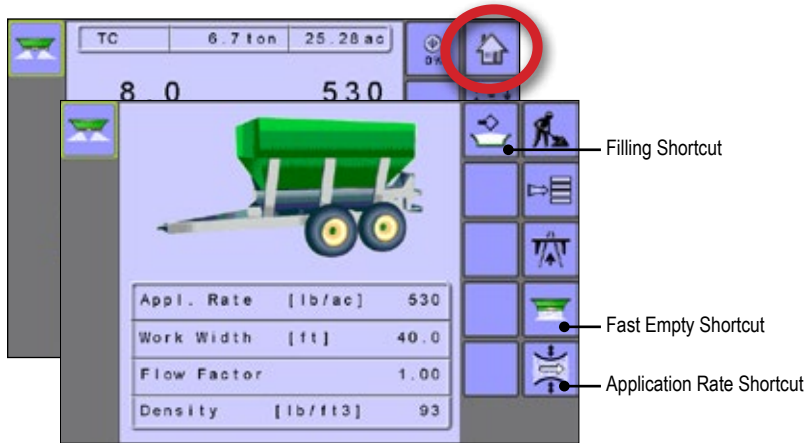
APPENDIX

Home Screen Shortcut Keys

From the Home Screen, shortcuts to Filling, Fast Empty and Application Rate settings are available.

- To view the Home Screen, select HOME KEY  in the top right corner of any screen.

Figure 2-2: Home Screen



APPLICATION RATE OPTIONS

Target Rate


The Target Application Rates defines one (1) target rate of product being applied per hectare/acre and is indicated by the target icon . Target application rate is established in the Job Parameters under Application Rate.

Figure 2-3: Application Target Rate



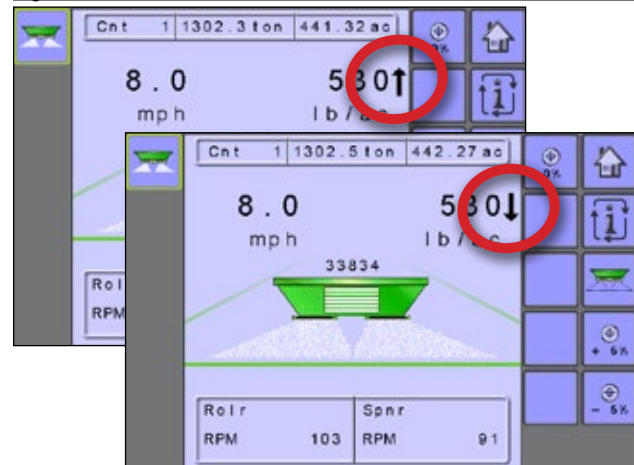
Figure 2-4: Application Target Rate



Roller Increase/Decrease Indicators




Indicates if the rollers need to increase or decrease to meet the target application rate at the current speed.

Figure 2-5: Roller Increase/Decrease Indicators



Target Rate Percentage Increase/ Decrease

Target Rate Percentage Increase/Decrease Keys adjust the application target rate per the established percentage set in the Machine Operation setup screen under Application Rate Step.

- To adjust the Application Rate, press the BOOST/STEP % INCREASE/DECREASE KEYS  .
- To cancel the Application Rate percentage increase/decrease, press the BOOST/STEP % RESET KEY .

START/STOP APPLICATION

Starting/stopping application is controlled using the START/STOP KEYS.

- To start or stop the application, press the START/STOP KEYS .

Figure 2-6: Spreading Stopped



Figure 2-7: Spreading Started

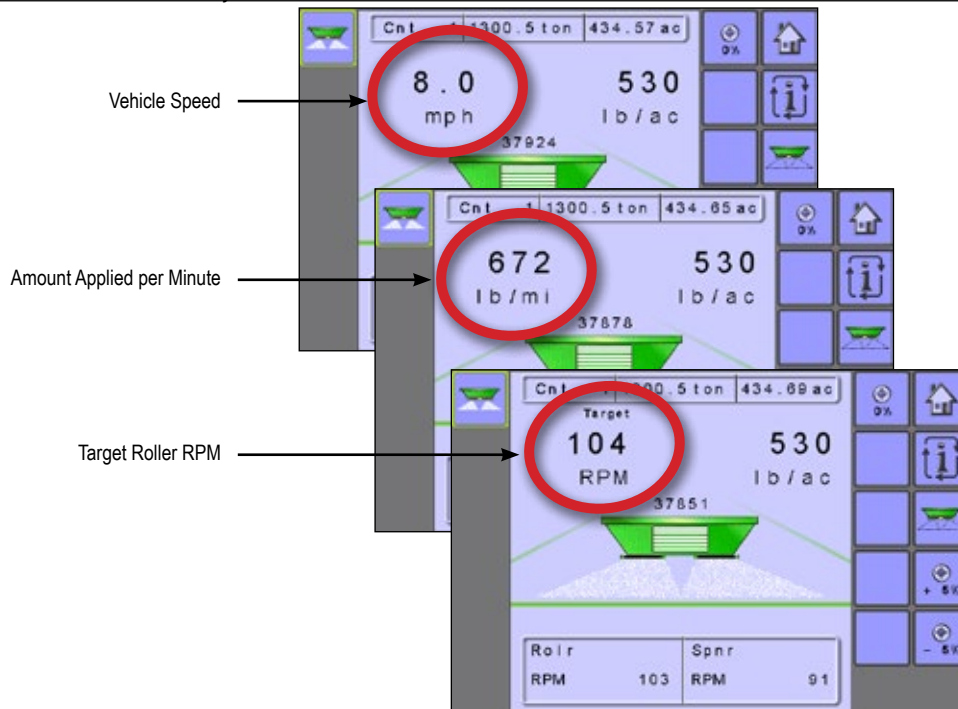


INFORMATION KEY

The INFORMATION KEY  toggles the Speed/Application Information section on the Operation Screen between the display modes.

- Vehicle Speed
- Amount Applied per Minute
- Target Roller RPM

Figure 2-8: Information Key



ISOBUS Job Computer: IC18 Spreader

CHAPTER 3 – MAIN SETUP



Main Setup Mode configures the Counters, Job Parameters, Machine, User Interface, Communication and Help options.


NOTE: The menu structure on your display might vary from the one displayed in this User Manual depending on the UT being used.

MAIN SETUP MODE MENU STRUCTURE

Counters	Job Parameters	Machine	User Interface	Communications	Help
▶ Trip		▶ *Filling			▶ Diagnostic
▶ Campaign		▶ Operation			▶ About
▶ Total		▼ Implement Parameters			▶ Factory Settings
▶ Export		▼ Calibrations			
		▶ *Application Rate			
		▶ *Pulses Per Volume			
		▶ *Volume Per Pulse			
		▶ *Amount Per Pulse			
		▶ *Hydraulic System			
		▶ Implement Speed Sensor			
		▶ *Weighing System			
		▶ Alarm Configurations			
		▶ OEM			
		▶ Sensors			
		▶ Actuators			
		▶ User Interface			
		▶ Regulator Configuration			
		▶ Calibration RPM			
		▶ Program Modes			
		▶ Reference Gate Height			
		▶ Delete Total Counters			
		▶ TC - Implement Settings			

The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

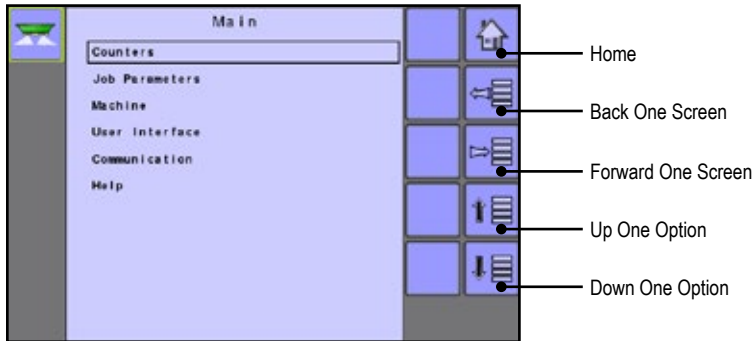
**Menu settings directly related to OEM equipment.*

1. Select MAIN SETUP SCREEN KEY  from the Home Screen.
2. Select from:
 - ▶ Counters – used to provide an overview of various system counters.
 - ◀ Trip – used to display information regarding area, distance, time and amount applied.
 - ◀ Campaign – used to display information regarding area, amount applied and time for all trips.
 - ◀ Total – used to display information regarding area, amount applied and time for all activity.
 - ◀ Export Counters – allows counter information to be exported in HTML or CSV format.
 - ▶ Job Parameters – used to configure application settings including Trip Counter, Application Rate, Tonnage, Bed Size, Gate Height, Density and Flow Factor.
 - ▶ Machine – used to configure machine settings:
 - ◀ Filling – establishes the amount of material remaining in the tank.
 - ◀ Operation – establishes Speed Source and Simulated Speed.
 - ◀ Implement Parameters – establishes the Working Width, Fast Empty Bed RPM and Master Switch location.
 - ◀ Calibrations – establishes either manual or automatic settings of the sensors.
 - ◀ Alarm Configurations – establishes alarms “On” or “Off” as well as sets their trigger level.
 - ◀ OEM – the OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. Refer to the OEM Setup Chapter for information regarding OEM settings.
 - ▶ User Interface – used to allow the operator to select the system UT if more than one UT is available on the ISOBUS CAN.

- ▶ Communication – used to establish the IC18's ability to communicate with an external computer.
- ▶ Help – allows the operator to perform diagnostics, access the About screen and reset the system to Factory Settings:
 - ◀ Diagnostic – used to troubleshoot input/output of the controller (sensor or actuator).
 - ◀ About – used to provide information on the console such as software version, build number, etc.
 - ◀ Factory Settings – used to reset the system to factory default settings.

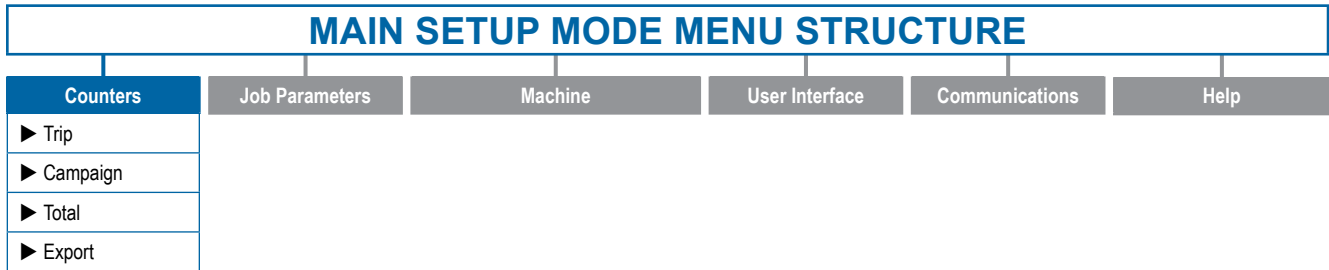
NOTE: The menu structure on your display might vary from the one displayed in this user guide depending on the UT being used. This user guide will display all possible options.

Figure 3-1: Main Setup Screen



COUNTERS

The Counters Menu provides an overview of various system counters including Trip Counters, Campaign Counters and Total Counters. From this screen one can also Export Counters.




1. From the Main Setup Screen , select COUNTERS.
2. Select from:
 - ▶ Trip – used to display information regarding area, distance, time and amount applied.
 - ▶ Campaign – used to display information regarding area, amount applied and time for all trips.
 - ▶ Total – used to display information regarding area, amount applied and time for all activity.
 - ▶ Export Counters – allows counter information to be exported in HTML or CSV format.

Figure 3-2: Counters



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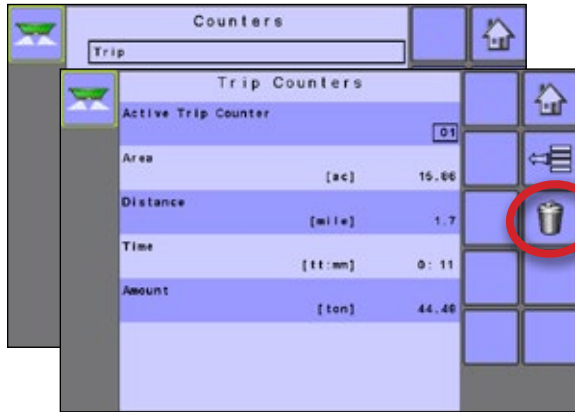
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Trip Counters


Trip Counters displays information regarding area, distance, time and amount applied. The trip that is active is displayed/active on the Operations Screen.

Figure 3-3: Trip Counters



Active Trip Counter

One of up to ten (10) Active Trip Counters can be selected to view the desired trip information. The trip that is "active" is displayed/active on the Operation Screen.

- To clear the Trip Counters, select TRASH CAN KEY . A confirmation screen will be displayed.

Area Counter

Displays applied area for the selected Active Trip.

Distance Counter

Displays distance traveled for the selected Active Trip.

Time Counter

Displays time traveled for the selected Active Trip.

Amount

Displays amount of material applied during the selected Active Trip.

Campaign Counters

Campaign Counters display information regarding area, amount applied and time for all trips.


- To clear the Campaign Counters, select TRASH CAN KEY . A confirmation screen will be displayed. If a password was established in the OEM menu, it will be required to clear the Campaign Counter.

Figure 3-4: Campaign Counters



Area Counter

Displays total applied area for all trips.

Amount Counter

Displays total amount of material applied during all trips.

Time Counter

Displays total time traveled for all trips.

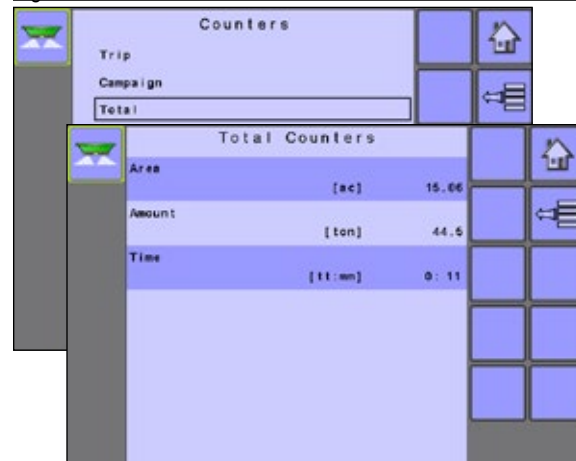
Password to Clear

If a password was established in the OEM menu, it will be required to clear the Campaign Counter.

Total Counters

Total Counters displays information regarding area, amount applied and time for all activity. Total Counters can only be cleared in the OEM menu.

Figure 3-5: Total Counters



Area Counter

Displays total applied area for all trips.

Amount Counter



Displays total amount of material applied during all trips.

Time Counter

Displays total time traveled for all trips.

Export Counters

Export Counters allows counter information to be exported in HTML or CSV format. HTML files can be viewed from an internet browser. CSV files can be viewed as Excel sheets.

- To export a HTML file, select HTML KEY . A confirmation screen will be displayed.
- To export a CSV file, select CSV KEY . A confirmation screen will be displayed.
- Follow the instructions displayed.

For data transfer, an optional cable is required. Contact your local dealer for additional information.

Figure 3-6: Export Counters



JOB PARAMETERS

Job Parameters configures application settings. Options include Active Trip Counter, Application Rate, Tonnage, Bed Size, Gate Height, Density and Flow Factor.

MAIN SETUP MODE MENU STRUCTURE



1. From the Main Setup Screen , select JOB PARAMETERS.

Figure 3-7: Job Parameters



NOTE: For specific calibration options to appear, a specific sensor needs to be installed or a program mode needs to be selected. Sensor availability is activated on the Sensor Presence screen in the OEM section. Program Mode is established in the OEM section.

Active Trip Counter

Active Trip Counter selects one of up to ten (10) active trip counters to view the desired trip information. The trip that is “active” is displayed/active on the Operation Screen.

NOTE: The selected trip counter will have all data modified (added to) when additional operations are activated. If current trip counter is not cleared, the new data will be added to the existing data.

Application Rate

Application Rate defines a target rate of product being applied per hectare/acre. This setting will set the same for all active trips.

Tonnage

Tonnage converts pounds/kilograms to tons. It is used when the application rate exceeds the number of digits allowed on the screen display.

Bed Size

Bed Size defines the maximum amount that can fit in the holding container.

Gate Height

Gate Height defines the height of the gate opening.

Density

Density defines the weight of the material being applied.

Flow Factor

The fertilizer's ability to flow is affected by a number of factors (shape, grain, weight, moisture). These factors may vary with each batch and it may change due to weather (humidity, etc.). In order to accommodate for this, the IC18 uses a flow factor to compensate for the nature of the applied fertilizer.

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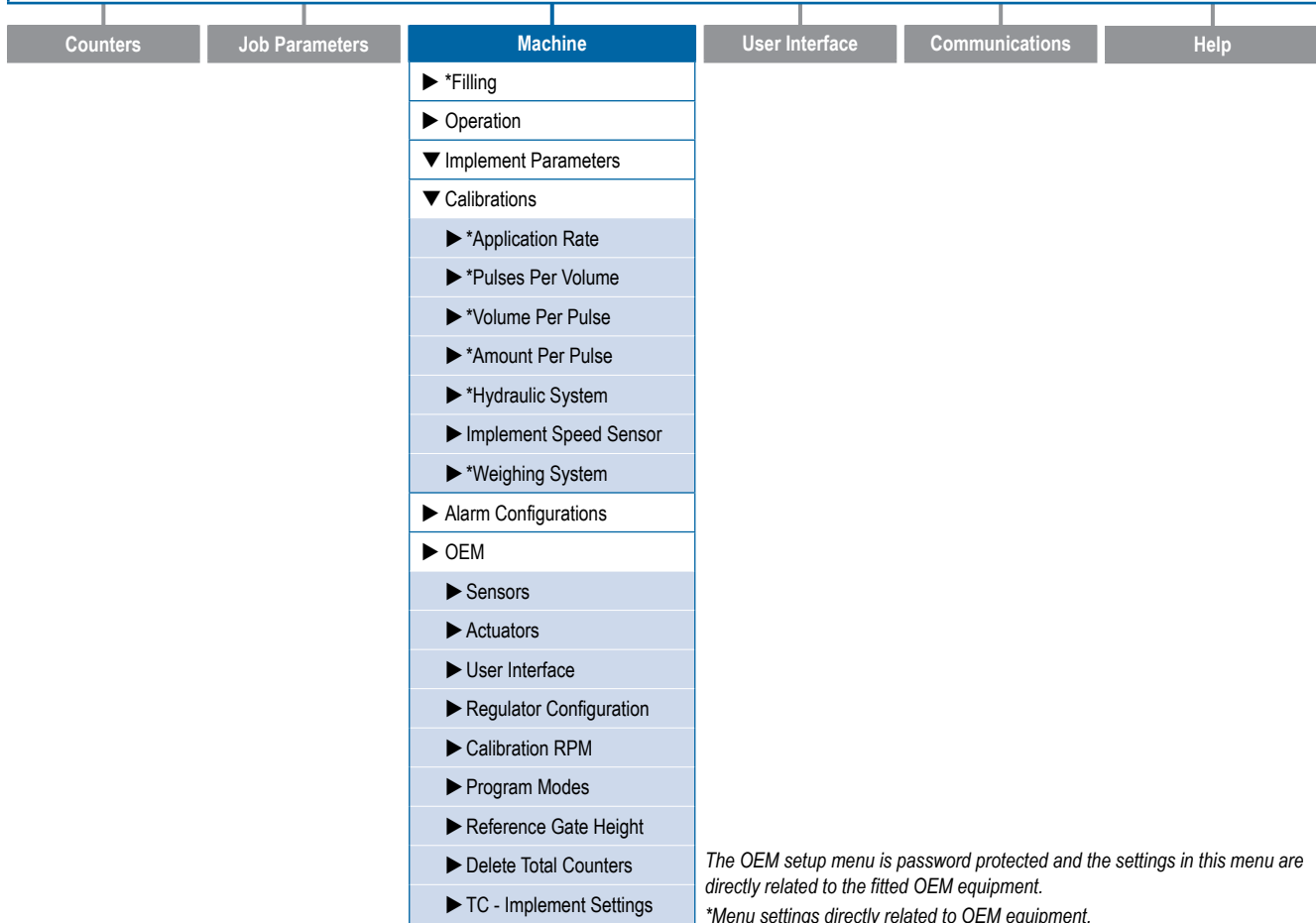
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MACHINE

Machine configures machine settings. Options include Filling, Operation, Implement Parameters, Calibrations, Alarm Configurations and OEM.

MAIN SETUP MODE MENU STRUCTURE



The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

*Menu settings directly related to OEM equipment.


- From the MAIN SETUP SCREEN , select MACHINE.
- Select from:
 - ▶ Filling – establishes the amount of material remaining in the bed.
 - ▶ Operation – establishes Speed Source, Application Rate Step and Simulated Speed.
 - ▶ Implement Parameters – establishes the Working Width, Fast Empty Bed RPM and Master Switch location.
 - ▶ Calibrations – establishes either manual or automatic settings of the sensors.
NOTE: Options may vary depending on OEM settings.
 - ▶ Alarm Configurations – establishes alarms “on” or “off” as well as sets their trigger level.
 - ▶ OEM – The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. Refer to the OEM chapter for information regarding OEM settings.

Figure 3-8: Machine



Filling

Filling establishes the amount of material remaining in the bed.


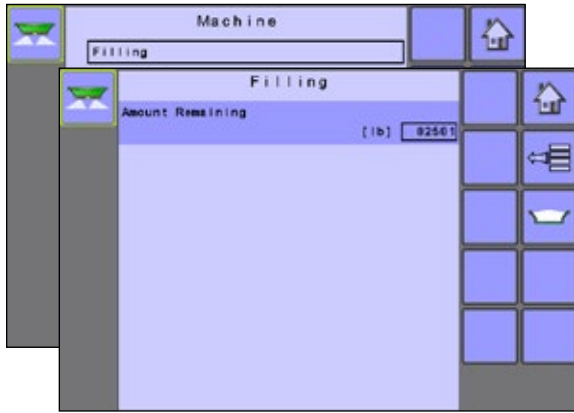
NOTE: The size of the bed is established in the OEM menu. This is the number that will repopulate when the FULL BED KEY  is pressed.

Figure 3-9: Filling



Filling - NOT AVAILABLE


Filling is not available when a weight system is activated.

Amount Remaining

Amount Remaining displays the calculated material left in the bed. The amount can be manually adjusted.

Full Bed

Full bed returns the amount remaining value to the maximum amount of material in the bed.

- To reset the amount remaining value, press the FULL BED KEY .

Operation

Operation establishes Application Rate Step, Speed Source and Simulated Speed.

Figure 3-10: Operation



Application Rate Step

Application Rate Step is the percent of increase/decrease “boost” of the active application rate at which the product is being applied.

Figure 3-11: Step % Increase/Decrease



Speed Source

Speed Source selects whether to base the machine’s speed on input from the CAN, the Implement or a Simulated source. Selecting “Implement” will allow for the configuration of pulses per 100 meters. Selecting “Simulated” will allow for simulated speed to be entered using the “Edit Value” option. Selecting “CAN” allows for speed being supplied by the ISOBUS CAN (usually from the TECU) to be used.

NOTE: If “Implement” is selected, refer to the Calibrations section for further instructions.

Simulated Speed

Simulated Speed establishes a speed to be used when using the Simulated Speed source.

Implement Parameters

Implement Parameters establishes Working Width, Fast Empty Bed RPM and Master Switch location.

Figure 3-12: Implement parameters




Working Width



Working Width establishes the desired distance between each adjacent pass while spreading.

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Fast Empty Bed RPM

Fast Empty Bed RPM establishes the revolutions per minute of the roller used to drive the conveyor during the Fast Empty. The availability of Fast Empty Bed is established in the OEM menu under Program Modes. When set to "On", the FAST EMPTY BED KEY  will be available on the Home Screen.

Master Switch

Master Switch is used to allow the operator to choose between a remote switch or console. Select "Remote Switch" when using a switchbox to operate equipment. Select "Console" to use the START/STOP KEY   on the Operation Screen to operate equipment.

Calibrations

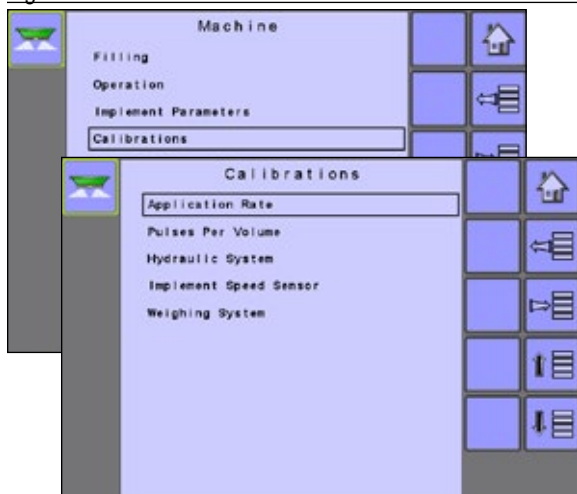
Calibrations establishes either manual or automatic settings of the sensors. Different options will be available depending on the OEM-> Program Modes settings.

Calibration options may include the following:

- ◀ Application Rate – establishes a corrected flow factor or calibration number using a calibration function.
- ◀ Pulses Per Volume – establishes number of pulses for one (1) cubic foot or one (1) cubic centimeter.
- ◀ Volume Per Pulse – establishes the amount of cubic feet or cubic centimeters per one (1) pulse.
- ◀ Amount Per Pulse – establishes amount of application per one (1) pulse.
- ◀ Hydraulic System – used to calculate the maximum RPM at the machine's full throttle rate.
- ◀ Implement Speed Sensor – establishes the wheel pulses over a specified distance.
- ◀ Weighing System – used to determine the amount of product in the bed.

NOTE: For specific calibration options to appear, a specific sensor needs to be installed. Sensor availability is activated on the Sensors screen in the OEM section. For additional details, see the OEM chapter of this manual or the Setting Menu Options table.

Figure 3-13: Calibrations



Application Rate

An application rate test establishes a corrected flow factor or calibration number using a calibration function. This figure is determined by measuring the bed at a predetermined and pre measured amount and then again after a sufficient amount has been spread. Based on the differences between the measured and known amounts, a factor is determined to accurately calculate future application rates.

NOTE: Options will vary depending on options set in OEM-> Program Modes-> Flow Correction Type.

Figure 3-14: Application Rate



Expected Application Rate

Expected Application Rate is the target rate of application in pounds per acre.

Actual Application Rate

Actual Application Rate is the actual rate of application that is calculated once the test has been completed.




Active Flow Factor

Active Flow Factor is the current flow factor.

Corrected Flow Factor Calibration

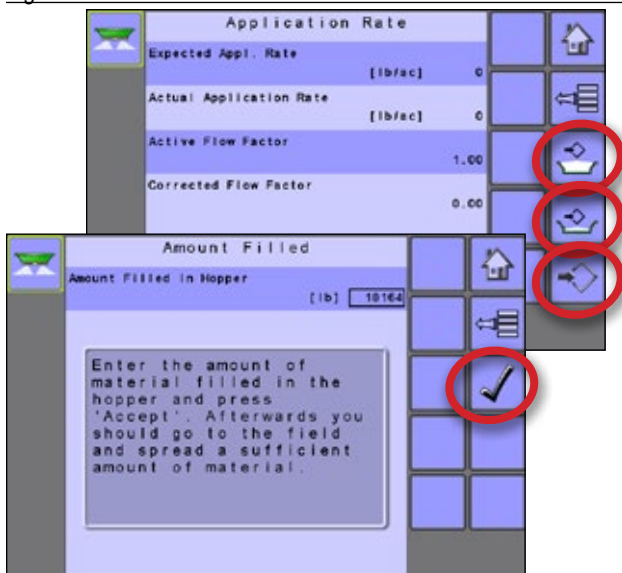
Corrected Flow Factor calibration is the actual flow factor that is calculated once the test is completed.

Corrected Flow Factor Procedure:

- Select BEGIN APPLICATION KEY .
- Follow the instructions displayed.
- Press END APPLICATION KEY .
- Follow the instructions displayed.
- Press APPLY CORRECTED CALIBRATION KEY .
- Follow the instructions displayed.

NOTE: Material will be dispensed during this procedure. Be sure that remaining bed contents can be determined.

Figure 3-15: Corrected Flow Factor Procedure






Active Calibration Number

Active Calibration Number is the current calibration number.

Corrected Calibration Number

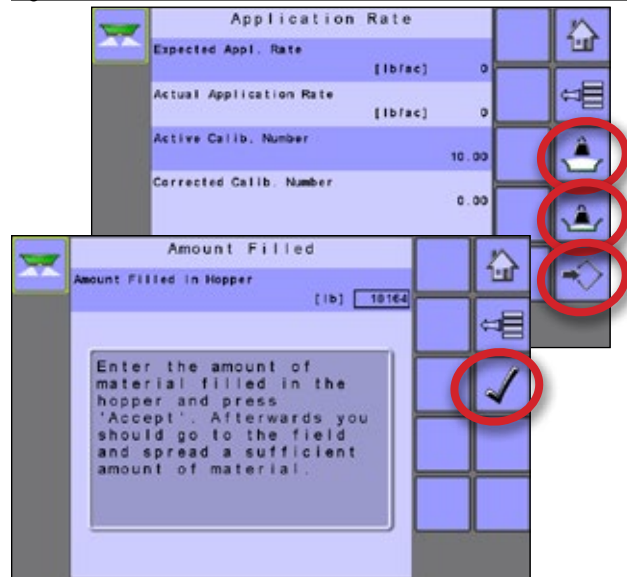
Corrected Calibration Number calibration is the actual calibration number that is calculated once the test is completed.

Corrected Calibration Number Procedure:

- Select BEGIN APPLICATION KEY .
- Follow the instructions displayed.
- Press END APPLICATION KEY .
- Follow the instructions displayed.
- Press APPLY CORRECTED CALIBRATION KEY .
- Follow the instructions displayed.

NOTE: Material will be dispensed during this procedure. Be sure that remaining bed contents can be determined.

Figure 3-16: Corrected Calibration Number Procedure



Pulses Per Volume

Pulses Per Volume establishes number of pulses for one (1) cubic foot or one (1) cubic centimeter. This value can be established manually or calibrated automatically. Each type of spreader has a variety of variables that factor into the pulses per volume number (roller diameter, gate height and width, sensor type, type of belt or chain, etc.). The pulses per volume number factors these variables into the spreader output.

NOTE: This option is ONLY available when OEM->Program Mode->Program Style is set to North American and the console units are set to US.

NOTE: The calibration is based on the Reference Gate Height, which defaults to 4 in / 10 cm. This number is accessed in the OEM Menu. The actual Gate Height during calibration MUST match the reference gate height setting.

Figure 3-17: Pulses per Volume




Manual Calibration

Manual calibration establishes the pulses based on a user entered value.

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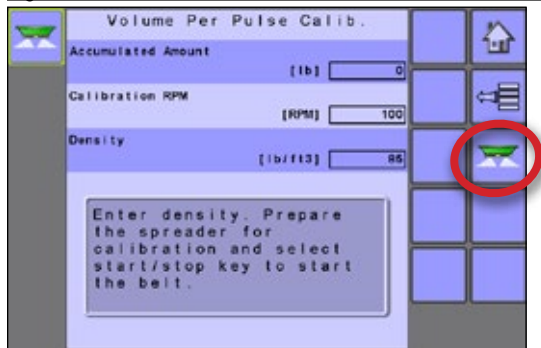
Automatic Calibration

Automatic calibration establishes the pulses using the automatic calibration function.

- To calibrate the pulses per volume, select CALIBRATION KEY .
- Follow the series of instructions displayed.

NOTE: Material will be dispensed during this procedure. Be sure that a collection device is in place so that a proper volume can be determined.

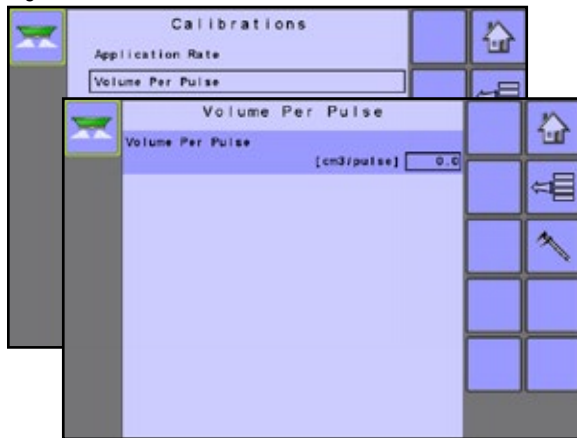
Figure 3-18: Pulses Per Volume Calibration



Volume Per Pulse

Volume Per Pulse establishes the amount of cubic feet or cubic centimeters per one (1) pulse. This value can be established manually or calibrated automatically. Each type of spreader has a variety of variables that factor into the volume per pulse number (roller diameter, sensor type, type of belt or chain, etc.). The volume per pulse number factors these variables into the spreader output

Figure 3-19: Volume Per Pulse




Manual Calibration

Manual calibration establishes the pulses based on a user entered value.

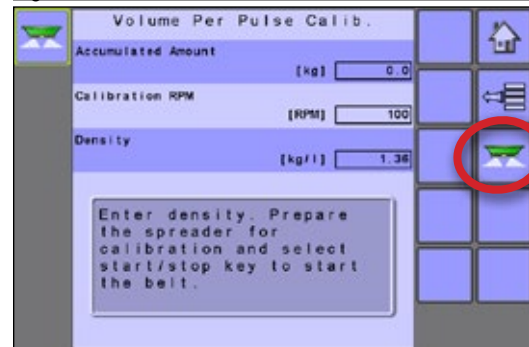
Automatic Calibration

Automatic calibration establishes the volume using the automatic calibration function.

- To calibrate the volume per pulse, select CALIBRATION KEY .
- Follow the series of instructions displayed.

NOTE: Material will be dispensed during this procedure. Be sure that a collection device is in place so that a proper volume can be determined.

Figure 3-20: Volume Per Pulse Calibration



Amount Per Pulse

Amount Per Pulse establishes amount of application per one (1) pulse. This value can be established manually or calibrated automatically. Each type of spreader has a variety of variables that factor into the pulses per amount number (roller diameter, gate height and width, sensor type, type of belt or chain, etc.). The amount per pulse number factors these variables into the spreader output.

NOTE: This option is available when OEM->Program Mode is set to Weight Based.

NOTE: The calibration in North America Mode is based on the Reference Gate Height, which defaults to 4 in / 10 cm. This number is accessed in the OEM Menu. The actual Gate Height during calibration MUST match the reference gate height setting.

Figure 3-21: Amount Per Pulse




Manual Calibration

Manual calibration establishes the amount based on a user entered value.

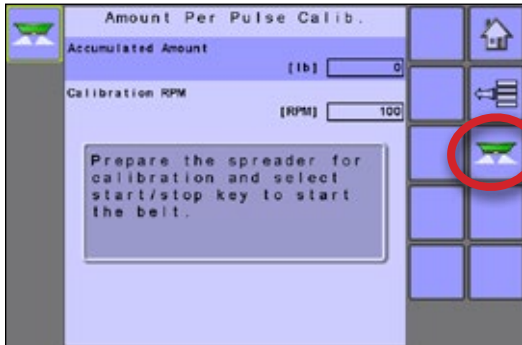
Automatic Calibration

Automatic calibration establishes the amount using the automatic calibration function.

- To calibrate the pulses per amount, select CALIBRATION KEY .
- Follow the series of instructions displayed.

NOTE: Material will be dispensed during this procedure. Be sure that a collection device is in place so that a proper weight can be determined.

Figure 3-22: Amount Per Pulse Calibration



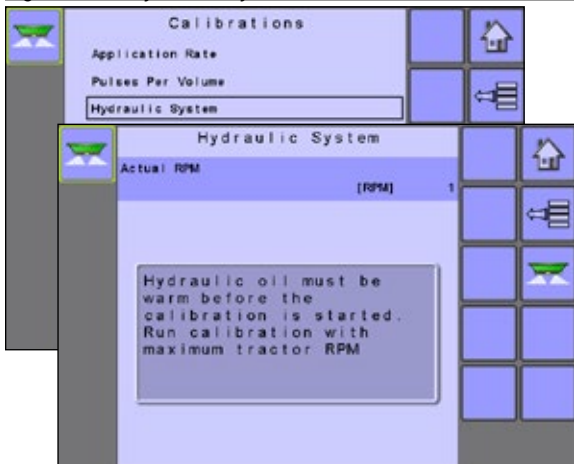
Hydraulic System

The Hydraulic System menu is used to calculate the maximum RPM at the machine's full throttle rate.

Duty Cycle Offset Calibration RPM value is used while making a Hydraulic Calibration (Machine-> OEM-> Regulator Configuration-> PWM Signal-> Duty Cycled Offset Calibrations RPM). Once calibration is started, the roller RPM has to reach that minimum value within 10 seconds, else a warning will appear. This is to make sure tractor is providing enough hydraulic oil to make a valid Hydraulic Calibration.



NOTE: Hydraulic Calibration is used to automatically determine OEM "Maximum Duty Cycle" and "Duty Cycle Offset" values (Machine->OEM-> Regulator Configuration-> PWM Signal).

Figure 3-23: Hydraulic System



Automatic Calibration

Calibration establishes the Actual RPM using the automatic calibration function.

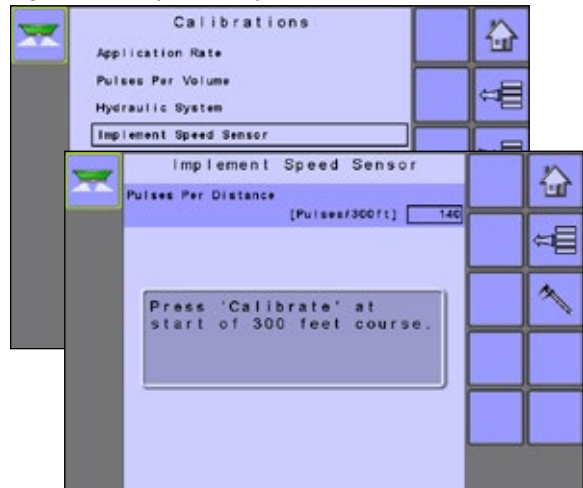
- To run the hydraulic calibration, press START KEY .
- Once the Actual RPM has been populated, press the STOP KEY  to complete the calibration.
- Follow the series of instructions displayed.

NOTE: Manual calibration is not available for Hydraulic System Calibration.

Implement Speed Sensor

The Implement Speed Sensor establishes the wheel pulses over a specified distance. This value can be established manually or calibrated automatically.

Figure 3-24: Implement Speed Sensor




Manual Calibration

Manual calibration establishes the pulses based on a user entered value.

Automatic Calibration

Automatic calibration establishes the pulses using the automatic calibration function.

- To calibrate pulses per distance, select CALIBRATION KEY .
- Follow the series of instructions displayed.

The counted wheel pulses will be displayed during the automatic calibration.

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Weighing System

A weighing system is used to determine the amount of product in the bed. The weighing system must be calibrated and its taring point established.

Figure 3-25: Calibrate Weighing System



Calibrate Weighing System

Establishes a calibration figure for calibrating the weighing system sensor. This figure is determined by measuring the bed at empty and at a predetermined and pre measured amount. Based on the differences between the measured and known amounts, a factor is determined to accurately calculate all future weights.

NOTE: If the Weighing System is turned on in the OEM menu, (OEM-> Sensors-> Sensor Configuration) the Weighing System menu item will show as an option on the Calibrations page.

Figure 3-26: Weighing System Calibration




Manual Calibration

Manual calibration establishes the calibration based on user entered values.

Automatic Calibration

If the calibration figure for the weighing system sensor is not known or to make sure the value is correct, automatic calibration establishes the calibration.

- To calibrate the weighing system sensor, select CALIBRATION KEY .
- Follow the series of instructions displayed.

Tare Weighing System

Establishes the zero point or the starting point for the weighing system sensor. This point is determined by measuring the bed at empty.


- To calibrate the weighing system sensor, select CALIBRATION KEY .
- Follow the series of instructions displayed.

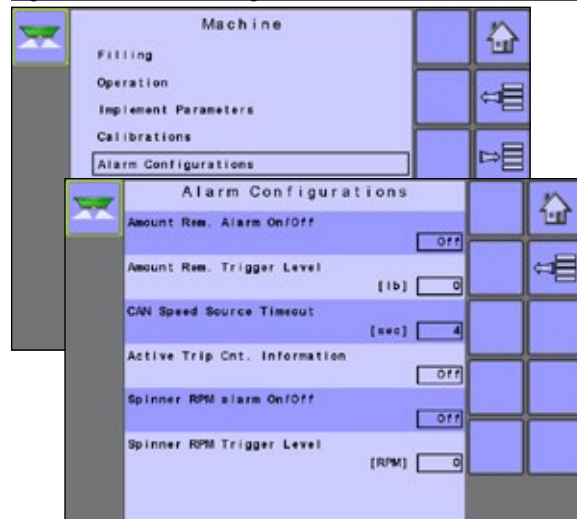
Figure 3-27: Tare Weighing System



Alarm Configurations

Alarm Configurations establishes alarms "on" or "off" as well as sets their trigger level.

Figure 3-28: Alarm Configurations



Amount Remaining Alarm On/Off

The Amount Remaining Alarm will appear if the bed amount has reached the low limit level entered. Select either "On" to activate the alarm, or "Off" to deactivate the alarm.

Amount Remaining Trigger Level

Amount Remaining Trigger Level establishes the low limit that will trigger the Amount Remaining Alarm.

CAN Speed Source Timeout

CAN Speed Source Timeout establishes the number of seconds the system will continue to run on CAN speed without receiving CAN input before the alarm triggers.

Active Trip Count Information

The Active Trip Count Information Alarm will appear on power up to identify to the user which trip counter is active and that this specific counter will be used for storing work data. Select either “On” to activate the alarm, or “Off” to deactivate the alarm.

Spinner RPM Alarm On/Off

The Spinner RPM Alarm will appear if the spinner RPM falls below the low limit level entered under Spinner RPM Trigger Level. Select either “On” to activate the alarm, or “Off” to deactivate the alarm. The availability of a Spinner RPM Sensor is established in the OEM menu under Sensors.

Spinner RPM Trigger Level

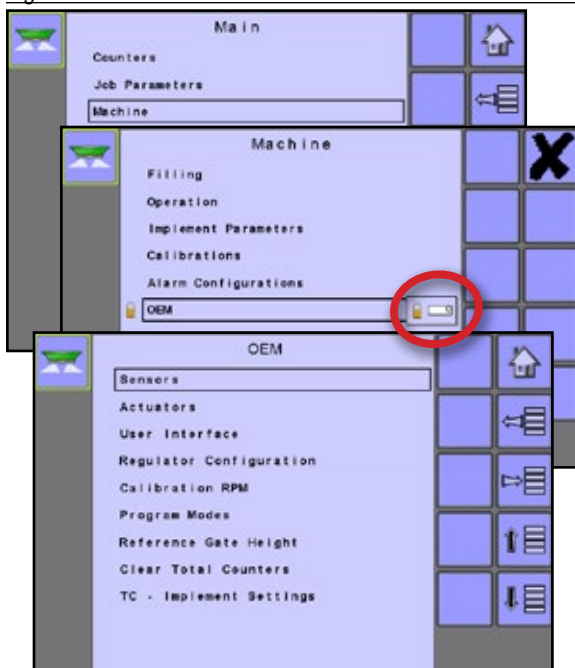
Spinner RPM Trigger Level establishes the low limit that will trigger the Spinner RPM Alarm.

OEM



The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. To obtain an access code, contact your local dealer or TeeJet Technologies Customer Service.

NOTE: Some setup options are available or unavailable depending on the OEM settings. See the “Settings Menu Options Table” for more information.

Figure 3-29: OEM – Unlock



To access the OEM screens:

1. From the Main Setup Screen , select MACHINE.
2. Select OEM.
3. Select the Access Code Entry Box to the right of the menu option.
4. Use the number pad or slide bar to enter the access code.
5. Select the ACCEPT KEY  to complete the unlock process
6. Select from:
 - ▶ Sensors – used to establish the parameters for Spinner RPM, Spinner RPM Revolution, Hydraulic Motor RPM Revolution and Weighing systems and Tank Empty Sensor.
 - ▶ Actuators – used to select the type of valve used to control the spreader belt and if a Dump Valve is installed.
 - ▶ User Interface – used to establish the displayed tolerance for application rate.
 - ▶ Regulator Configuration – used to establish:
 - ◀ Regulator Test – used to verify the regulation control matches theory and actual settings.
 - ◀ Valve Configuration – sets the control settings for the regulation valve when the belt valve type is set to Servo.
 - ◀ PID Parameters – sets the course, midrange and fine adjustments of the regulation valve.
 - ◀ PWM Signal – sets the PWM signal frequency; duty cycle maximum, offset and offset calibration RPM; and jitter frequency and amplitude when the belt valve type is set to PWM.
 - ◀ Load Valve Parameters – establishes a valve parameter set when the belt valve type is set to PWM.
 - ▶ Calibration RPM – used to program the desired roller RPM, the bed chain speed, used during the calibration process.
 - ▶ Program Modes – used to designate various options that impact system functions including program style, calibration type, flow factor, step percentage and fast empty working width reduction and adding a campaign count password.
 - ▶ Reference Gate Height – establishes the gate height reference when in North American Program Style.
 - ▶ Delete Total Counters – used to clear the Total Count system counter for Area, Amount and Time.
 - ▶ TC - Implement Settings – used to establish implement geometry and connection type.

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USER INTERFACE

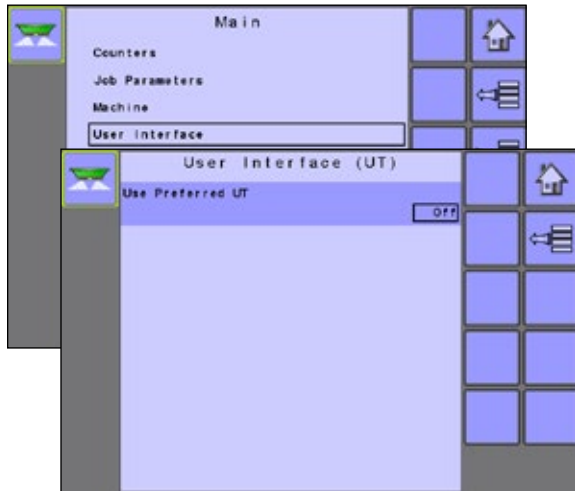
User Interface allows the operator to select the system Universal Terminal (UT) if more than one UT is available on the ISOBUS CAN.

MAIN SETUP MODE MENU STRUCTURE



1. From the Main Setup Screen , select USER INTERFACE.

Figure 3-30: User Interface



Use Preferred UT

Use Preferred UT sets the UT preference to either “on” or “off”. If “On” is selected, the preferred UT will be used. If “Off” is selected, the system will arbitrarily select which UT to use (if more than one UT is available on the ISOBUS CAN).

NOTE: This should always be set to “Off” unless another UT is on the CAN bus.

COMMUNICATION

Communication establishes the IC18's ability to communicate with an external computer.

MAIN SETUP MODE MENU STRUCTURE



1. From the Main Setup Screen , select COMMUNICATION.

Figure 3-31: Communication



Amount of Memory Left

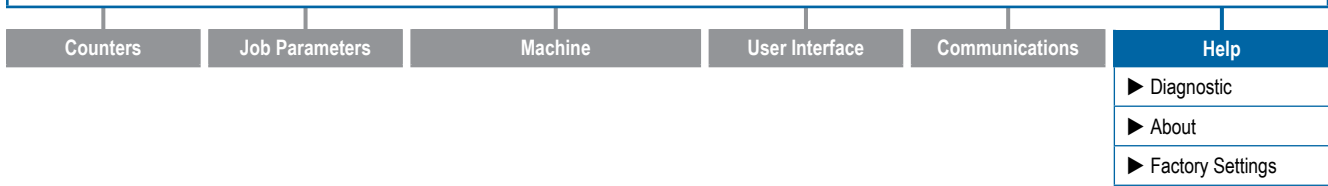
Displays the consoles memory availability for storage and file transfer.

NOTE: For more information about transferring data from a PC, please contact your local dealer or TeeJet Technologies Customer Service.

HELP

The Help menu allows the operator to perform Diagnostics, access the About screen and reset the system to Factory Settings. These menus are typically accessed upon Customer Service personnel request only.

MAIN SETUP MODE MENU STRUCTURE




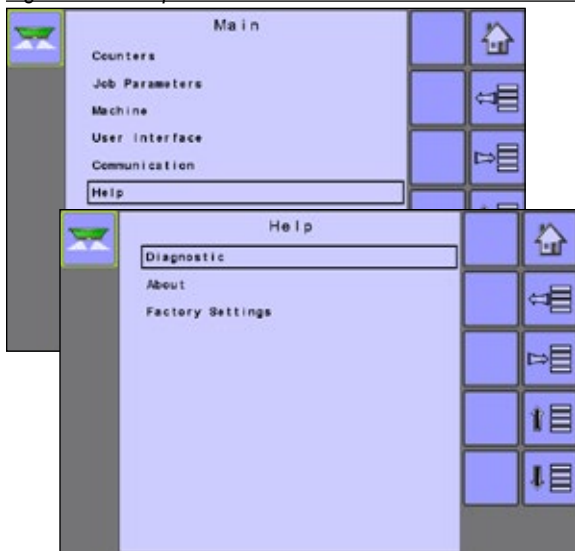
1. From the Main Setup Screen , select HELP.
2. Select from:
 - ▶ Diagnostic – used to troubleshoot input/output of the controller (sensor or actuator).
 - ▶ About – provides information on the console such as software version, serial number, CAN BUS information, etc.
 - ▶ Factory Settings – used to reset the system to factory default settings.

Figure 3-32: Help

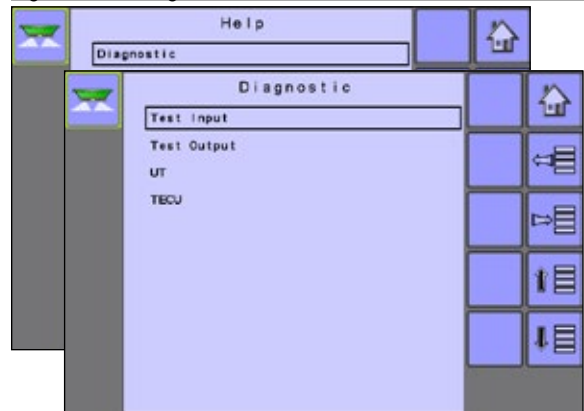


Diagnostic

Diagnostic is used to troubleshoot input/output of the controller (sensor or actuator).

- ▶ Test Input – displays the input high and low values on the installed sensors.
- ▶ Test Output – allows the regulation valve to be tested at different percentages of duty cycle.
- ▶ UT – provides information regarding the Universal Terminal (UT) controller.
- ▶ TECU – provides information regarding the Tractor Electronic Control Unit (TECU).

Figure 3-33: Diagnostic



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Test Input

Test Input displays the input high and low values on the installed sensors.


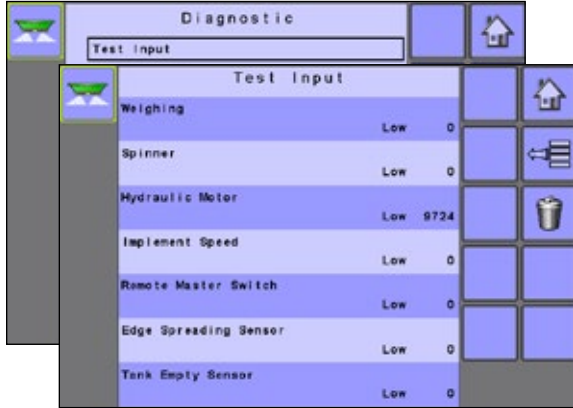
- To reset the sensors to "0", select TRASH CAN KEY .

Figure 3-34: Test Input



Test Output

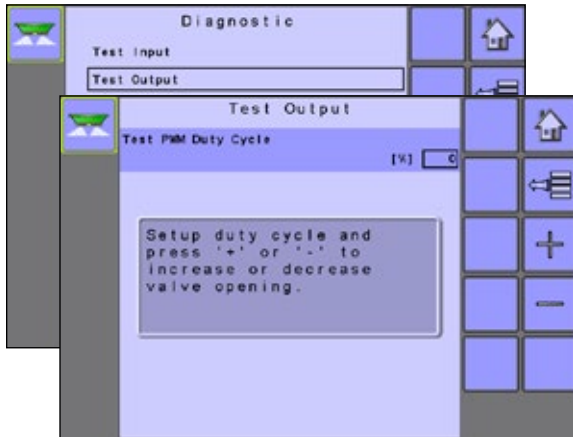
Test Output allows the regulation valve to be tested at different percentages of duty cycle.

Test PWM Duty Cycle

Liquid Valve PWM Duty Cycle is used to test the regulating valve at different percentages of duty cycle.



- Press the PLUS/MINUS KEYS   to test the regulation valve at the specified duty cycle percentage increase/decrease.

Figure 3-35: Test Output



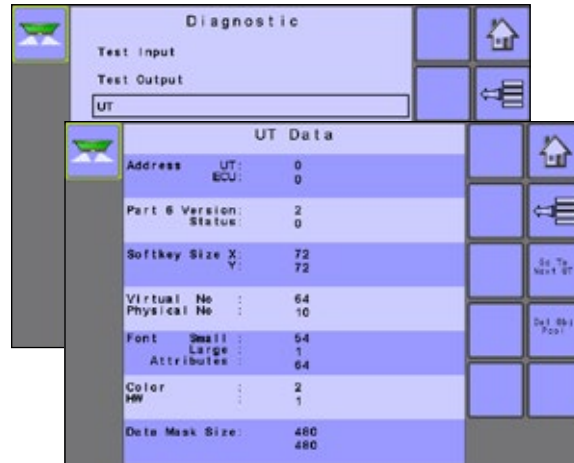
UT Data

The UT menu provides information regarding the universal terminal controller (i.e., address version, etc.).

- If more terminals/controllers are used, switch between these by pressing the GO TO NEXT UT KEY .
- Press the DELETE OBJECT POOL KEY  to force the UT to delete saved data and upload new information from the IC18 Job Computer on the next power cycle.

NOTE: Restart the IC18 Job Computer to implement and display changes.

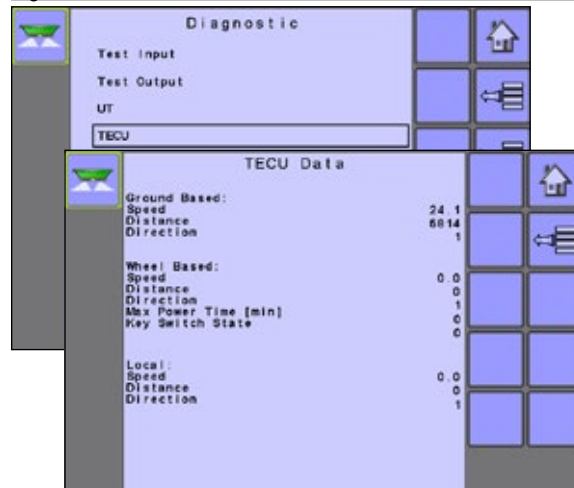
Figure 3-36: UT Data



TECU

The Tractor Electronic Control Unit (TECU) is a control unit, residing on the tractor, that performs basic functions such as power handling, speed info, etc. The TECU data is displayed on this page.

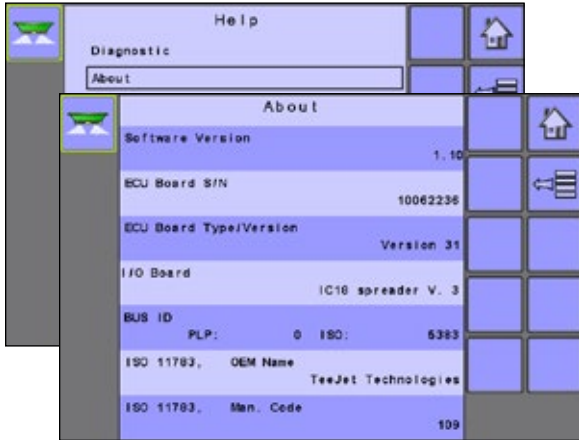
Figure 3-37: TECU Data



About

The About screen provides information on the IC18 such as software version, build number, etc. This information may become useful in case of technical support.

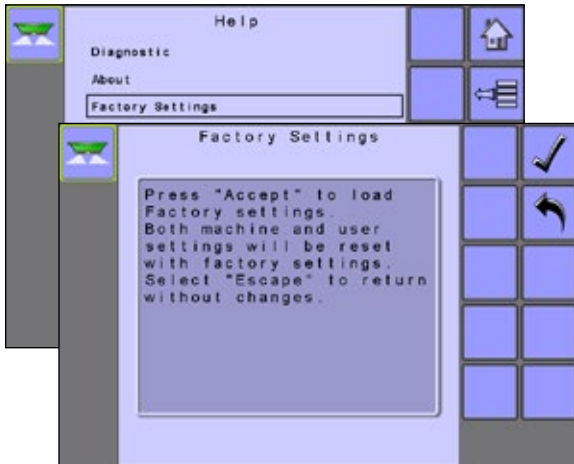
Figure 3-38: About



Factory Settings

The Factory Settings screen resets both machine and user settings to default settings from the factory.

Figure 3-39: Factory Settings



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SETTINGS MENU OPTIONS

The main settings menu contains six (6) options: Counters, Job Parameters, Machine, User Interface, Communication and Help. Each of these options either directly access settings or additional menus. The table below outlines the additional menus, options available on that menu item, and directs you to the setup pages for further information.

Settings Menu Options Legend:

■ = Sensor Configuration, ◆ = Actuator Configuration, ● = Program Modes, ✓ = Menu Item Always Available

* Options may also be set up from Operations screen

- | | | |
|---------------------------------------|--------------------------------------|---|
| 1 Spinner RPM Sensor: On | 6 Program Style: European Mode | 11 Flow Correction Type: Calibration Number |
| 2 Weighing System: Off | 7 Program Style: North American Mode | 12 Step Percent: On |
| 3 Weighing System: On | 8 Calibration Type: Weight Based | 13 Work Width Reduction: On |
| ◆ Belt Valve Type: PWM (motor driven) | 9 Calibration Type: Volume Base | 14 Campaign Count Password: On |
| ◆ Belt Valve Type: Servo (coil based) | 10 Flow Correction Type: Flow Factor | |

Counters	Trip		✓		
	Campaign	Area	✓		
		Amount	✓		
		Time	✓		
		Password to Clear	14		
		Total	✓		
	Export	✓			
Job Parameters	Active Trip Counter		✓		
	Application Rate		✓		
	Tonnage		✓		
	Bed Size		✓		
	Gate Height		7		
	Density		9		
	Flow Factor		10		
Machine	*Filling		2		
	Operation	Application Rate Step	12		
		Speed Source	✓		
		Simulated Speed	✓		
		Working Width Step	13		
	Implement Parameters		✓		
	*Application Rate	Expected Application Rate		10 11	
		Actual Application Rate		10 11	
		Active Flow Factor		10	
		Corrected Flow Factor		10	
		Active Calibration Number		11	
		Corrected Calibration Number		11	
		Calibrations	Pulses Per Volume		7 9
			Volume Per Pulse		6 9
			Amount Per Pulse		8
Hydraulic System			◆		
Implement Speed Sensor			✓		
Weighing System		3			

(Continued on next page)

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Machine (Continued)	- Alarm Configurations	Amount Remaining Alarm on/off	✓	
		Amount Remaining Trigger Level	✓	
		CAN Speed Source Timeout	✓	
		Active Trip Count Information	✓	
		Spinner RPM Alarm	1	
	- Sensors	✓		
	- Actuators	✓		
	- User Interface	✓		
		- Regulator Test	✓	
		- Valve Configuration	✓	
	- OEM	- Regulator Configurations	Coarse Adjustment	✓
			- PID Parameters - Fine Adjustment	✓
			Midrange Adjustment	✓
			- PWM Signal	✓
		- Load Valve Parameters	✓	
	- Calibration RPM	✓		
	- Program Modes	✓		
	- Reference Gate Height	7		
	- Clear Total Counters	✓		
	- TC - Implement Settings	✓		
User Interface	✓			
Communication	✓			
Help	✓			

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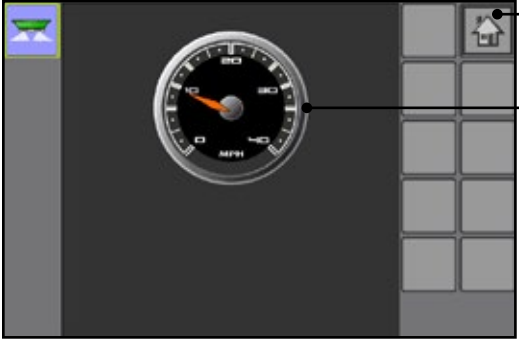


While in Transport Mode, all operation functions are locked off and cannot be activated. Transport Mode displays the speed in analogue mode.

Figure 4-1: Navigating to Transport Mode from the Home Screen



Figure 4-2: Transport Mode



Home Key - Exits Transport Mode and gives access to the IC18's available functions: Operation Mode, Transport Mode and Main Setup

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CHAPTER 5 – HOME SCREEN SHORTCUTS

Fast Empty Key Shortcut

The FAST EMPTY SHORTCUT KEY  allows the user to empty the bed of its contents without having the spinners on.


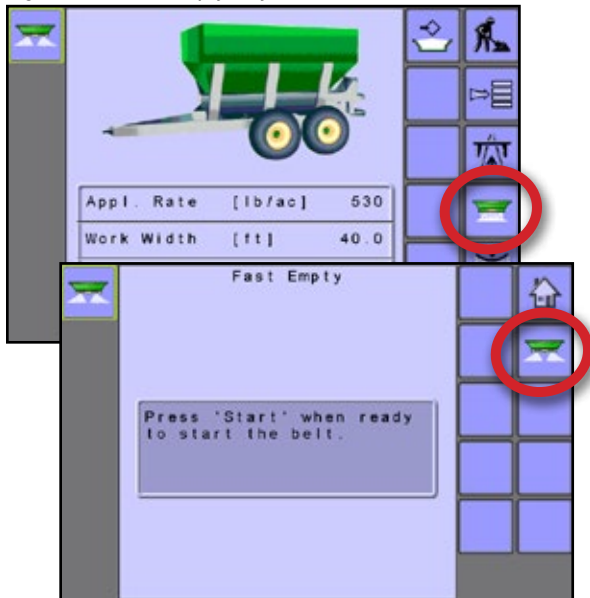

- Press the FAST EMPTY SHORTCUT KEY .
- Follow instructions on screen.

Figure 5-1: Fast Empty Key



Filling Shortcut Key



When available, FILLING SHORTCUT KEY  gives the user quick access to and from the filling options.

Weighing System Sensor Activated

Fill Bed Access Key Unavailable – When a weighing system sensor is installed and activated, the bed amount is determined by the sensor.

Weighing System Sensor NOT Activated

Filling Shortcut Key Available – The Filling Shortcut Key gives one press access to the Filling Menu. There the amount of material remaining in the bed is established and/or the amount remaining value can be reset to the maximum volume of the bed.

- Press the FILLING SHORTCUT KEY .
- Press Amount Remaining to manually adjust the amount in the bed.
- Press the FULL BED KEY  to set to full amount.


The size of the bed is established under Machine -> OEM -> Bed Size. This is the number that will repopulate when the FULL BED KEY  is pressed.

Figure 5-2: Filling Shortcut Key



Application Rate Shortcut Key


The APPLICATION RATE SHORTCUT KEY  gives the user access to calibrate the Active Flow Factor. For more information, see Main Setup-> Machine-> Calibrations-> Application Rate.

Figure 5-3: Application Rate Shortcut Key

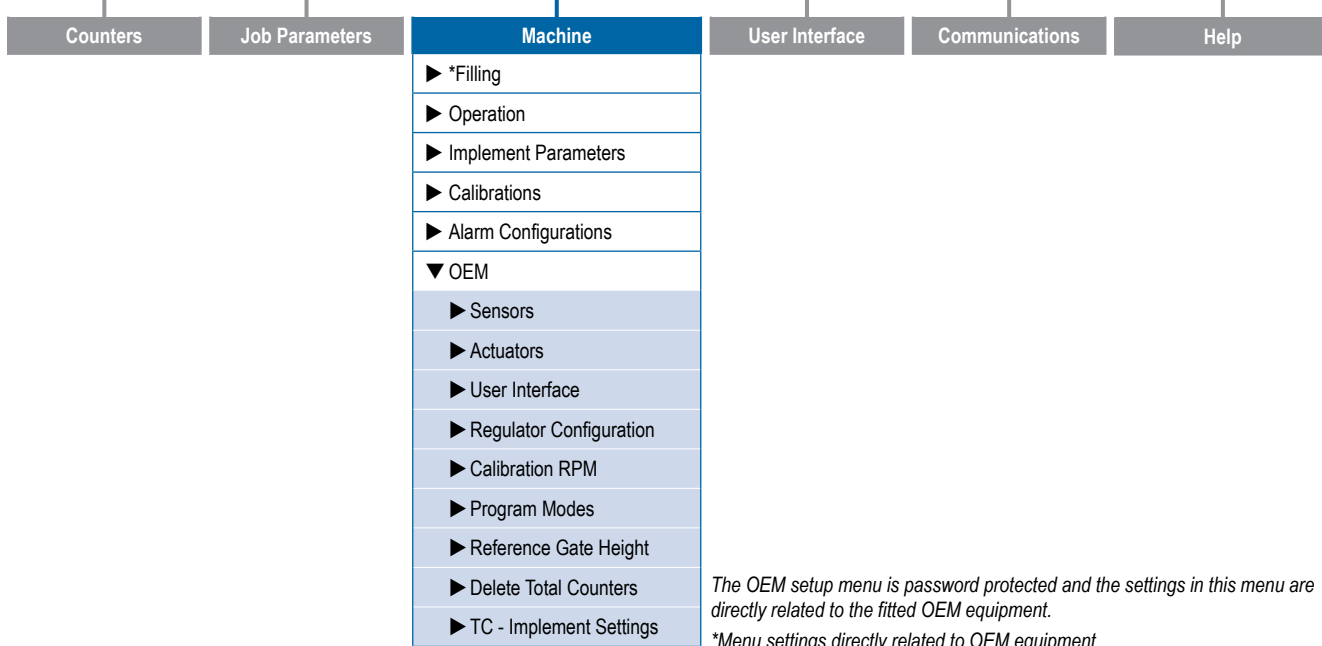


CHAPTER 6 – OEM OPTIONS

The OEM setup menu is password protected and the settings in the menu are directly related to the fitted OEM equipment. Contact the manufacturer or local dealer for service.


NOTE: Some setup options are available or unavailable depending on the OEM settings. See the “Settings Menu Options Table” for more information.

MAIN SETUP MODE MENU STRUCTURE



The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

*Menu settings directly related to OEM equipment.

- From the Main Setup Screen , select MACHINE.
- Select OEM.
- Select the Access Code Entry Box to the right of the menu option.
- Use the number pad or slide bar to enter the access code.
- Select the ACCEPT KEY to complete the unlock process
- Select from:

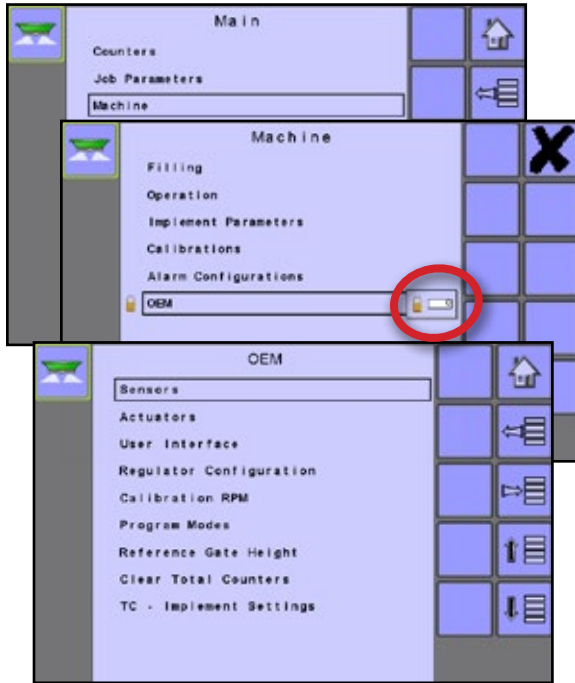
- ▶ Sensors – used to establish the parameters for Spinner RPM, Spinner RPM Revolution, Hydraulic Motor RPM Revolution and Weighing systems and Tank Empty Sensor.
- ▶ Actuators – used to select the type of valve used to control the spreader belt and if a Dump Valve is installed.
- ▶ User Interface – used to establish the displayed tolerance for application rate.
- ▶ Regulator Configuration – used to establish:
 - ◀Regulator Test – used to verify the regulation control matches theory and actual settings.
 - ◀Valve Configuration – sets the control settings for the regulation valve when the belt valve type is set to Servo.
 - ◀PID Parameters – sets the course, midrange and fine adjustments of the regulation valve.
 - ◀PWM Signal – sets the PWM signal frequency; duty cycle maximum, offset and offset calibration RPM; and jitter

frequency and amplitude when the belt valve type is set to PWM.

◀Load Valve Parameters – establishes a valve parameter set when the belt valve type is set to PWM.

- ▶ Calibration RPM – used to program the desired roller RPM, the bed chain speed, used during the calibration process.
- ▶ Program Modes – used to designate various options that impact system functions including program style, calibration type, flow factor, step percentage and fast empty working width reduction and adding a campaign count password.
- ▶ Reference Gate Height – establishes the gate height reference when in North American Program Style.
- ▶ Delete Total Counters – used to clear the Total Count system counter for Area, Amount and Time.
- ▶ TC - Implement Settings – used to establish implement geometry and connection type.

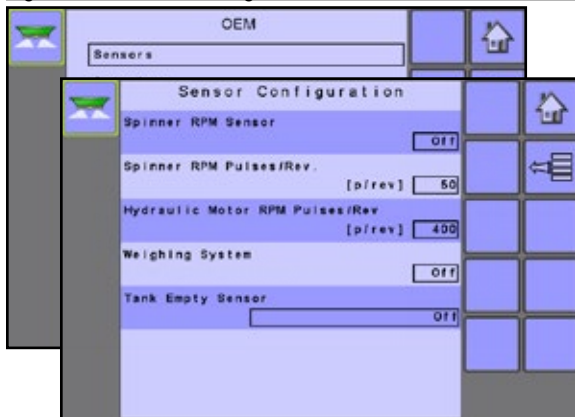
Figure 6-1: OEM



Sensors

Sensors establishes the parameters for Spinner RPM, Spinner RPM Revolution, Hydraulic Motor RPM Revolution, Weighing systems and Tank Empty. If the fitted sensors are not registered here, the sensor options will not be available in the calibration menus.

Figure 6-2: Sensor Configuration



Spinner RPM Sensor

Spinner RPM Sensor sets the associated sensor availability to “On” or “Off”.

Spinner RPM Pulses per Revolution

Spinner RPM Pulses/Revolution establishes the number of pulses per one (1) revolution for the Spinner RPM sensor.

Hydraulic Motor RPM Pulses per Revolution

Hydraulic Motor RPM Pulses/Revolution establishes the number of pulses per one (1) revolution of the hydraulic motor.

Weighing System

Weighing System sets the associated sensor availability to “On” or “Off”. When on, the Weighing System option is displayed on the Calibrations menu and the Fill Bed Access Key is not available on the Home Screen.

Tank Empty Sensor

Tank Empty Sensor sets the associated sensor availability to off or two different on options:

- ◀ Off – sensor is deactivated
- ◀ Warning On Signal – sensor gives an alert when fertilizer covers the sensor
- ◀ Warning On No Signal – sensor gives an alert when it has no fertilizer covering the sensor

Actuators

Actuators is used to select the type of valve used to control the spreader belt.

Figure 6-3: Actuator Configuration



Belt Valve Type

Belt Valve Type establishes the type of valve used to control the spreader belt. If a PWM valve is being used, select “PWM (Motor Driven)”. If a servo valve is being used, select “Servo (Coil Based)”.

Dump Valve Installed

Dump Valve Installed sets the associated valve availability to “On” or “Off”. Dump Valve can be used with a PWM or a Servo valve.

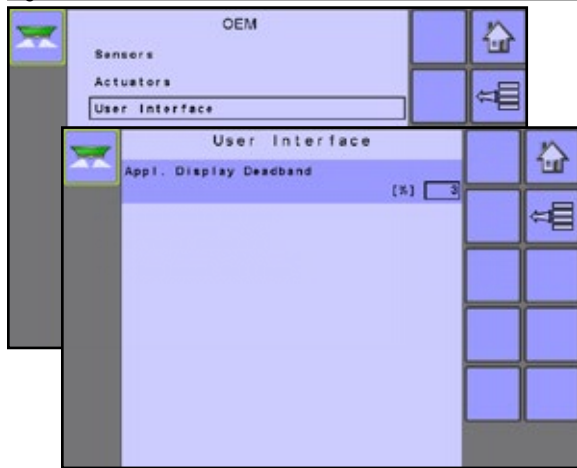
The Dump Valve diverts oil from the regulation valve to stop the belt. When the Dump Valve is installed and activated, the regulation valve will hold its position when the Master Switch is used to stop product application. When the Master Switch is pressed to begin product application, the Dump Valve will close and allow oil to flow to the regulation valve; therefore, the belt/chain will begin to rotate.

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User Interface

User Interface establishes the displayed tolerance for application rate (displayed deadband).

Figure 6-4: User Interface



Application Rate Display Deadband

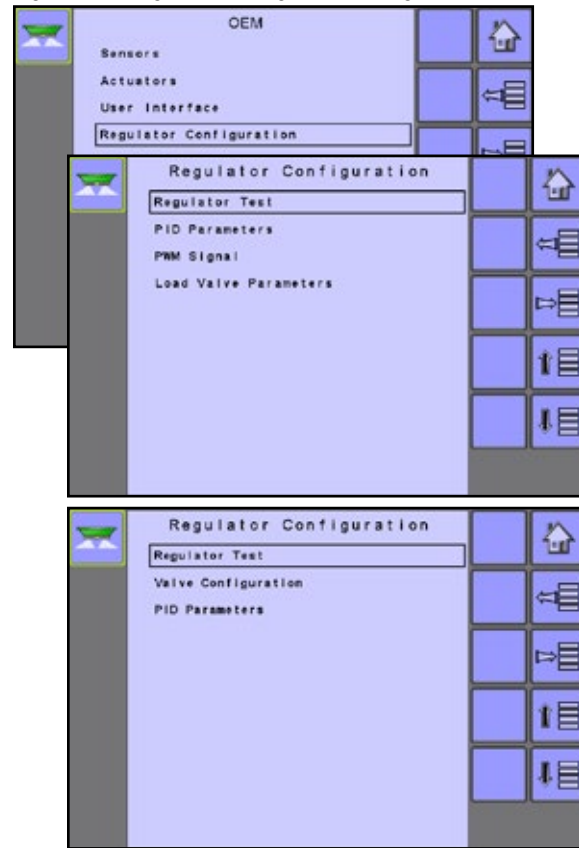
Application Rate Display Deadband is a deadband used for shifting between showing Target Application Rate vs. Actual Application Rate while spreading. Once actual application rate gets within the set percentage of the target application rate, target application rate is shown.

Regulator Configuration

Regulator Configuration establishes the following:

- ▶ Regulator Test – used to verify the regulation control matches theory and actual settings
- ▶ Valve Configuration (Belt Valve Type: Servo) – sets the control settings for the regulation valve
- ▶ PID Parameters – sets the course and fine adjustments of the regulation valve.
- ▶ PWM Signal (Belt Valve Type: PWM) – sets the control settings for the PWM Proportional valve
- ▶ Load Valve Parameters (Belt Valve Type: PWM) – allows OEM selection between pre-set P, I and D values (PID Parameters sets the course, fine and midrange adjustments of the regulation valve)

Figure 6-5: Regulator Configuration - Regulator Test



Regulator Test

The regulator test is used to verify the regulation control matches theory and actual settings.

Figure 6-6: Regulator Test



RPM Reference

RPM Reference displays the actual RPM for the given setpoint and duty cycle being tested.

Actual Duty Cycle

Actual Duty Cycle displays the actual duty cycle used during the regulator test.

RPM Setpoint

The RPM Setpoint is the RPM at which the Regulator Test will simulate the belt roller RPM.

Duty Cycle Step Percent

The Duty Cycle Step Percent is the percentage of increase/decrease in the RPM setpoint for the regulation test.

Valve Configuration (Belt Valve Type: Servo)

Valve Configuration sets the control settings for the regulation valve.

Available with OEM-> Actuators-> Belt Valve Type: Servo.

Figure 6-7: Valve Configuration



Minimum Regulation Voltage

Minimum Regulation Voltage sets the minimum voltage required to actuate the regulation valve.

Regulation Backlash

Regulation Backlash sets the amount of time needed for the regulation valve to begin moving after a direction change.

Regulation Deadband

Regulation Deadband sets the tolerance between actual and target rates for the regulation valve.

PID Parameters

PID Parameters sets the course, fine and midrange adjustments of the regulation valve.

Figure 6-8: PID Parameters



Course Adjustment

Course Adjustment is the proportional control (large adjustments) of the regulator valve.

Fine Adjustment

Fine Adjustment is the integral control (very small adjustment) of the regulator valve.

PWM Signal (Belt Valve Type: PWM)

PWM Signal sets the control settings for the PWM Proportional valve.

Available with OEM-> Actuators-> Belt Valve Type: PWM.

Figure 6-9: PWM Signal



Signal Frequency

Signal Frequency sets the recommended operating PWM frequency.

Maximum Duty Cycle

Maximum duty cycle sets the maximum amount of drive used by the regulator. Controlling output above this percentage has no effect on oil-flow through the valve.

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Duty Cycle Offset

Duty cycle offset (minimum duty cycle) sets the minimum amount of drive used by the regulator. Controlling output below this value has no effect on oil-flow through the valve.





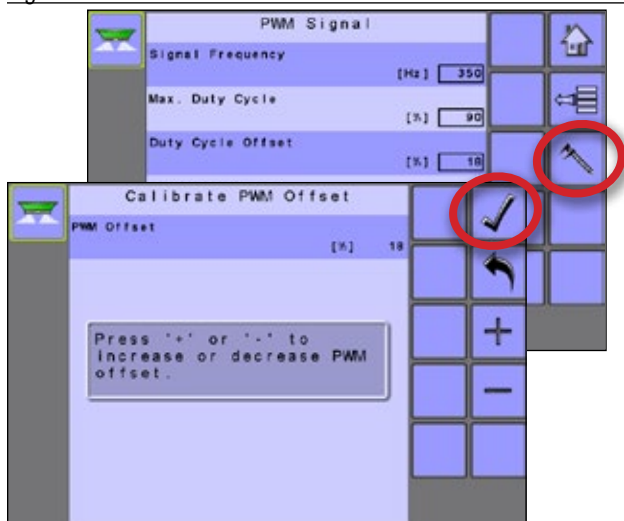
- To calibrate the PWM offset, select CALIBRATION KEY .
- Use the PLUS/MINUS KEYS   to increase or decrease the PWM offset percentage.
- Select the ACCEPT KEY  to save the selected percentage.

Figure 6-10: PWM Offset Calibration Procedure



Jitter Frequency (Dither Frequency)

Jitter Frequency (Dither Frequency) is a frequency superposed on top of the IC18 control output to help avoid stiction in the PWM proportional valve. Some Proportional valves requires this.

Jitter Amplitude (Dither Amplitude)

Jitter Amplitude (Dither Amplitude) is an amplitude superposed on top of the IC18 control output to help avoid stiction in the PWM proportional valve. Some Proportional valves requires this.

Duty Cycle Offset Calibration RPM

Duty Cycle Offset Calibration RPM value is used while making a Hydraulic Calibration (Main Setup-> Machine-> Calibration-> Hydraulic Calibration). Once calibration is started, the roller RPM has to reach this minimum value within 10 seconds, else a warning will appear. This is to make sure tractor is providing enough hydraulic oil to make a valid Hydraulic Calibration.

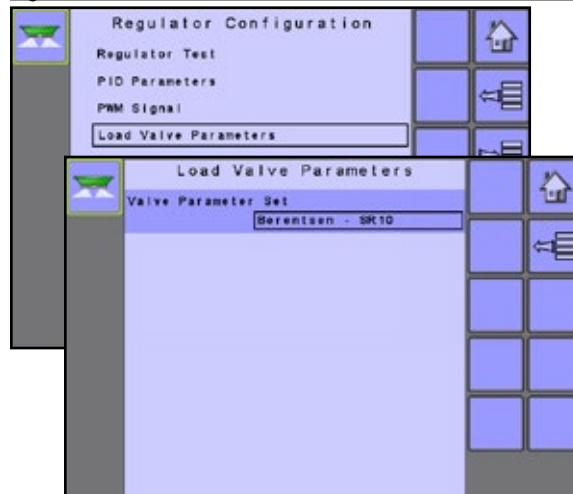
NOTE: Main Setup-> Machine-> Calibration-> Hydraulic Calibration is used to automatically determine OEM-> Regulation Configuration-> PWM Signal-> "Maximum Duty Cycle" and "Duty Cycle Offset" values.

Load Valve Parameters (Belt Valve Type: PWM)

Load Valve Parameters allows OEM selection between pre-set P, I and D values (PID Parameters sets the course, fine and midrange adjustments of the regulation valve).

Available with OEM-> Actuators-> Belt Valve Type: PWM.

Figure 6-11: Load Valve Parameters



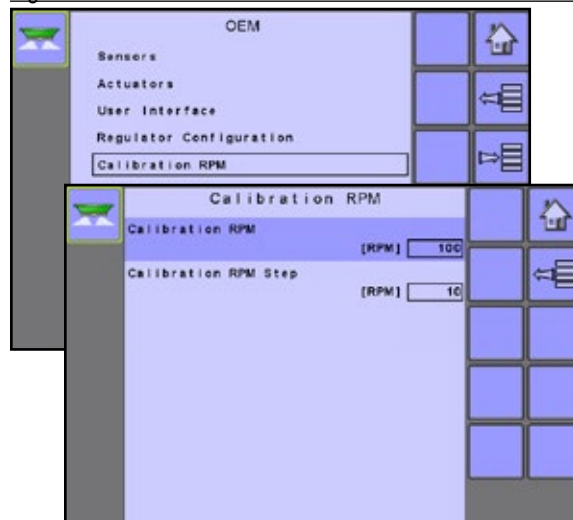
Valve Parameter Set

Valve Parameter Set establishes the pre-set values from either of two specific PWM proportional valve models: "Berendsen SR10" and "Danfoss PB12".

Calibration RPM

Calibration RPM is used to program the desired roller RPM, and the Calibration RPM Step percentage.

Figure 6-12: Calibration RPM



Calibration RPM

Calibration RPM is used to program the desired roller RPM while making a Volume/pulse calibration (Machine-> Calibration-> Volume per pulse).

Calibration RPM Step

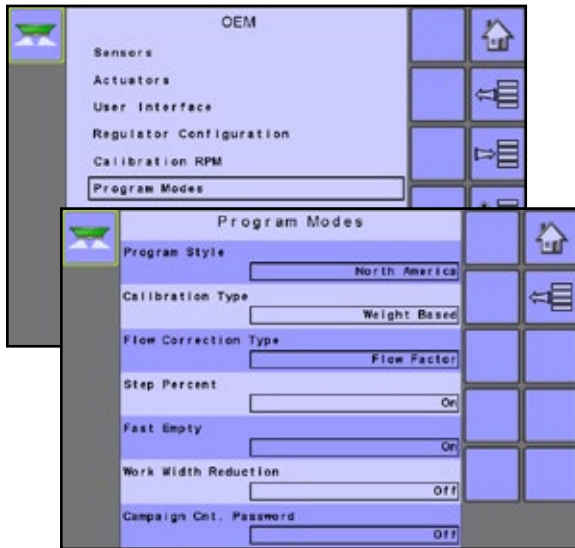
Calibration RPM Step is used to change the roller RPM in steps while making a Volume/pulse calibration.

Program Modes

Program Modes is used to designate various options that impact system functions.

NOTES: Program modes settings should not be changed without consulting TeeJet Technologies.

Figure 6-13: Program Modes



Program Style

Program Style establishes how calibrations are configured.

- ◀ European – Gate Height is NOT calculated into the product application and calibrations will be based on volume per pulse.
- ◀ North America – Gate Height is calculated into the product application and calibrations will be based on pulses per volume.

Calibration Type

Calibration Type establishes if your system is volume or weight based.

Flow Correction Type

Flow Correction Type establishes if a flow factor or calibration number will be used. If “Flow Factor” or “Calibration Number” is selected, Main Menu-> Machine-> Calibrations-> Application Rate will be available.

Step Percent

Step percent sets the associated menu option to “On” or “Off”. Target Rate Percentage Increase/Decrease Keys increase/decrease the application target rate per this established step percentage set in the Machine Operation setup screen under Application Rate Step. Automatic regulation mode will automatically adjust the application rate based on the current speed in reference to the target rate.

Fast Empty

Fast Empty sets the associated menu option to “On” or “Off”. The Fast Empty Key allows the user to empty the hopper of its contents without having the spinners on.

Work Width Reduction

Work Width Reduction sets the availability of the keys for changing current work width to appear on the Operation Screen. These keys will allow the operator to manually change the current working width if spreading into a wedge pattern field/track. Changes happens in steps of +/- 2 meter.

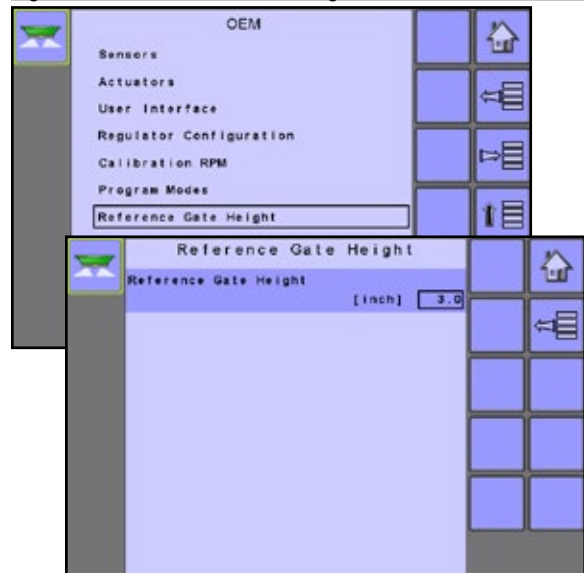
Campaign Count Password

Campaign Count Password establishes if a password is required to clear the Campaign Counters.

Reference Gate Height (Program Style: North America)

Reference Gate Height establishes the actual gate height (in inches) used during the calibration process. The calibration process uses one Reference Gate Height to calculate calibration values for all the various gate height settings. During the calibration process, the actual gate height used on the spreader and the Reference Gate Height must be the same. Performing a calibration using an actual gate height that is different than the Reference Gate Height will result in an incorrect calibration and may cause product to be misapplied. Available only in Program Style: North America.

Figure 6-14: Reference Gate Height



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Clear Total Counters

Clear Total Counters clears the Total Count system counter for Area, Volume and Time back to the default settings of “0”.


- To clear the total counters, select TRASH CAN KEY . A confirmation screen will be displayed.

Figure 6-15: Clear Total Counters



Area

Displays total applied area for all trips.

Volume

Displays total volume of material applied during all trips.

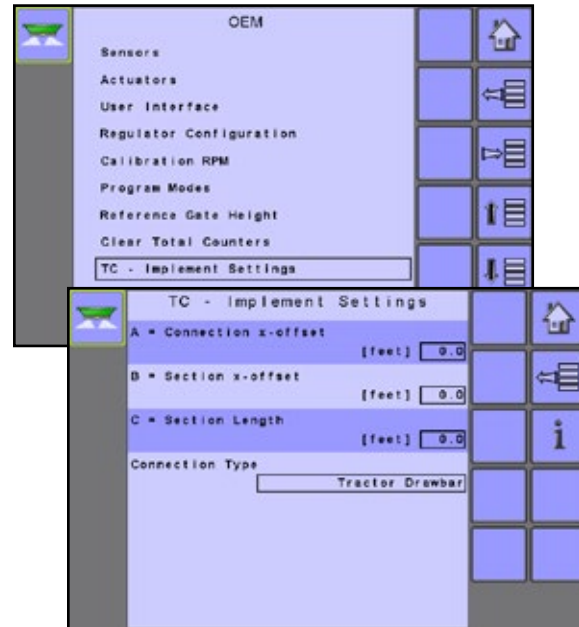
Time

Displays total time traveled for all trips.

TC-Implement Settings

TC-Implement Settings establishes the connector type and associated offsets between the vehicle and the implement

Figure 6-16: TC-Implement Settings



A = Connection x-offset

Measured in parallel to the centerline of the machine, defines the distance from the connection point to the center of the front axle of trailed implement..

B = Section x-offset

Measured in parallel to the centerline of the machine, defines the distance from the center of the front axle of trailed implement to the center of the section length (C).

C = Section Length


Measured in parallel to the centerline of the machine, defines the length of application for the section(s).

Connection Type

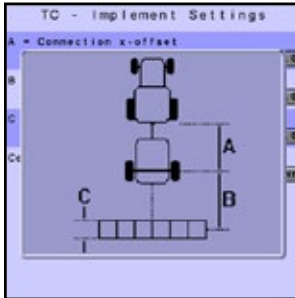
Connection Type establishes the type of connection between the vehicle and the implement.

Different machines have different options. The following machines are detailed in this manual. Contact your TeeJet dealer for information on your specific setup or if there are any questions.

- Unknown
- Tractor Drawbar
- 3-point Hitch Semi
- 3-point Hitch
- Hitch Hook
- Clevis Coupling
- Piton Coupling
- CUNA or Pivot Hitch
- Ball Type

Review the Help Screen  for more information about each connection type.

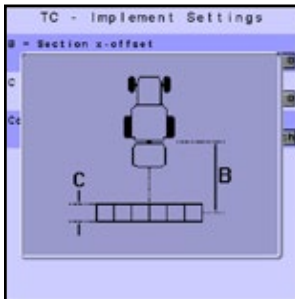
- A** – Connection x-offset
- B** – Section x-offset
- C** – Section Length



Connection Types:

- Unknown
- Tractor Drawbar
- 3-point Hitch Semi
- Hitch Hook
- Clevis Coupling
- Piton Coupling
- CUNA or Pivot Hitch
- Ball Type

- B** – Section x-offset
- C** – Section Length



Connection Types:

- 3-point Hitch

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APPENDIX A - FACTORY SETTINGS & RANGES

JOB PARAMETERS

Description	Factory Setting	Range/Options	User Setting
Active Trip Counter	1	1 - 10	1
			2
			3
			4
			5
			6
			7
			8
			9
			10
Application Rate	0.0 lb/ac 0.0 kg/ha	0.0 - 9999 lb/ac 0.0 - 9999 kg/ha	
Tonnage	Off	Off On	
Gate Height	4.0 in 10.0 cm	0.0 - 35.0 in 0.0 - 99.9 cm	
Density	0 lb/ft ³ 0.00 kg/l	0 - 300 lb/ft ³ 0.00 - 5.00 kg/l	
Flow Factor	1.00	0.2 - 2.00	

MACHINE

Filling

Description	Factory Setting	Range/Options	User Setting
Amount Remaining	16000 lb	0 - 90000 lb	
	8000 kg	0 - 45000 kg	

Operation

Description	Factory Setting	Range/Options	User Setting
Application Rate Step	0%	0-99 %	
Speed Source	CAN	CAN Implement Simulated	
Simulated Speed	0.0 mph	0.0 - 99.9 mph	
	0.0 km/h	0.0 - 99.9 km/h	

Implement Parameters

Description	Factory Setting	Range/Options	User Setting
Working Width	40.0 ft 12.2 m	0.0 - 290.0 ft 0.0 - 90.0 m	
Fast Empty Bed RPM	50 RPM	0 - 9999 RPM	
Master Switch	Console	Remote Switch Console	

Calibrations

Pulses Per Volume

Description	Factory Setting	Range	User Setting
Pulses Per Volume	10 pulses/ft ³	0 - 5000 /ft ³	

Volume Per Pulse

Description	Factory Setting	Range	User Setting
Volume Per Pulse	0.0 in ³ /pulse 0.0 cm ³ /pulse	0.0 - 90.0 in ³ /pulse 0.0 - 1500.0 cm ³ /pulse	

Amount Per Pulse

Description	Factory Setting	Range	User Setting
Amount Per Pulse	0.0 g/pulse	0.0 - 999.99 g/pulse	

Implement Speed Sensor

Description	Factory Setting	Range	User Setting
Pulses Per Distance	0.0 0	0 - 30000 /300 ft 0 - 40000 /100 m	

Alarm Configurations

Description	Factory Setting	Range/Options	User Setting
Amount Remaining Alarm On/Off	Off	On Off	
Amount Remaining Trigger Level	0 lb 0 kg	0 - 9000 lb 0 - 4500 kg	
CAN Speed Source Timeout	4 sec	0 - 999 sec	
Active Trip Count Information	Off	On Off	
Spinner RPM Alarm On/Off	Off	On Off	
Spinner RPM Trigger Level	0 RPM	0 - 9999 RPM	

USER INTERFACE

Description	Factory Setting	Options	User Setting
Use Preferred UT	Off	Off On	

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APPENDIX B - UNIT SPECIFICATIONS

Dimensions		7.5 x 7.25 x 2.375 in
		19.05 x 18.42 x 6.03 cm
Weight		1.42 lbs / 0.644kg
Connector		30 position Cinch pins. A1-K3
		30 position Cinch pins. L1-Y3
Environmental	Operating	-40 to +85°C
	Humidity	90% non-condensing
Input/Output		ISO 11783 (ISOBUS)
Power Requirement		<9 watts @12 VDC

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IC18 SPREADER JOB COMPUTER USER MANUAL



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