

Software version 1.05





A Subsidiary of Spraying Systems Co."

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- 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- PRODUCT OVERVIEW

Congratulations on the purchase of your new IC18 ECU built on the ISOBUS architecture. This IC18 unit has the capability of either sprayer or NH3 control when integrated into the implement of either capability. When used within the guidelines of the this manual, the IC18 controller will be a reliable application tool.

This manual covers the NH3 functions of the IC18 ECU. For Sprayer functions, see manual number 98-05204. Use with your existing VT or Matrix® 570VT

- · Works seamlessly and displays on any ISOBUS VT
- · Easy navigation menu and data rich display
- · IC18 Sprayer ECU suitable for use with NH3 and liquid fertilizer
- · Automatic boom section control upgrade option
- · Variable rate control available providing your VT has GPS and task control capability
- · Easy navigation menu and data rich display
- · Add additional ISOBUS ECUs as your needs change
- · Provides basic rate control
- Standardized plugs, cables and software simplify installation and connectivity and result in true "plug and play" technology. IC18 ECU resides on the implement, reducing hardware in the cab

Figure 1-1: IC18 Job Computer



# **OPTIONAL SYSTEM COMPONENTS**

## Matrix 570VT

The Matrix 570VT is a simple to operate, ISOBUScertified 5.7" color touch screen display suitable for bright daylight and nighttime operation

#### Figure 1-2: Matrix 570VT



## **IC18** Spreader **Electronic Control Unit**

Use with your existing VT or the Matrix 570VT for dry product application

- · Works seamlessly and displays on any ISOBUS VT
- · 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 VT has variable rate task control capabilities
- Standardized plugs, cables and software simplify installation and connectivity and result in true "plug and play" technology. IC18 ECU resides on the implement, reducing hardware in the cab

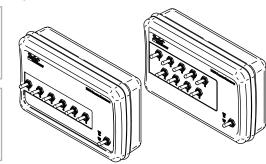
Figure 1-4: IC18 Spreader Electronic Control Unit



Manual section control with remote master capibility. The switchboxs are available in two configurations.

- ▶ 9 sections output or 8 sections and a master output
- ▶ 6 sections output or 5 sections and a master output

Figure 1-3: Switchboxes



## BoomPilot Electronic Control Unit for IC18

BoomPilot (automatic boom section control) is possible in combination with software built into the IC18 Sprayer/NH3 Electronic Control Unit (ECU). The ECU should be combined with the appropriate cable to interface with your BoomPilot system, spray controller and/or spraying machine for quick and easy installation. Electronic Control Units and their related cables are designed to control as many boom sections as the spray controller to which they are connect, up to a maximum of 9 boom sections.

Figure 1-5: BoomPilot Electronic Control Unit

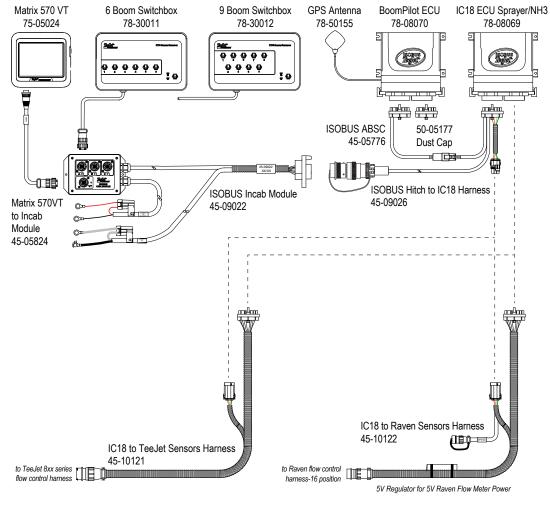


3

# CONFIGURATIONS

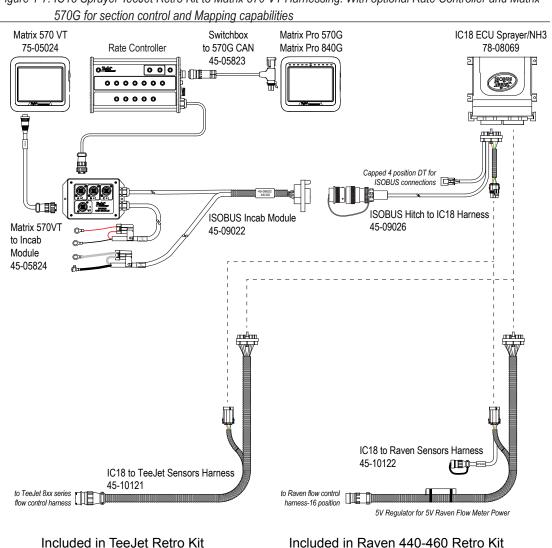
The following diagrams are reflective of typical IC18 Job Computer configurations. Due to the variety of possible configurations, these should be used for reference purposes only.

Figure 1-6: IC18 Sprayer Retro Kit to Matrix 570VT Harnessing with BoomPilot ECU and Optional Switchboxes





Included in Raven 440-460 Retro Kit



5



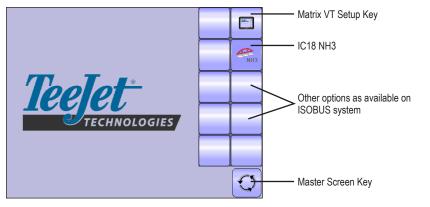
# **CHAPTER 2 – GETTING STARTED**

- 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.
- The menu structure on your display might vary from the one displayed in this User Manual depending on the virtual terminal being used.

## **START UP**

Power is continuously supplied to the job computer. The virtual terminal will give access to the job computer options and operation.

Figure 2-1: Master Screen - Crop Sprayer Mode

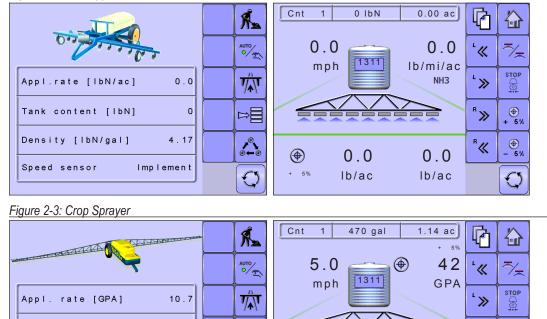


OVERVIEW

# **APPLICATION MODE**

The IC18 job computer is programed to be either a sprayer or NH3 applicator. 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 2-2: NH3 Applicator



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This manual discusses specifically the functions and options in NH3 Mode. See the specific IC18 Crop Sprayer

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<sup>₿</sup>≪

0

psi

025 (purple)

40 60 80

. + <sup>€</sup>%

\_ - 5%

GETTING STARTED

Tank volume [gal]

Nozzle

Speed sensor

1321

025 (purple)

Simulated

User Manual for functions and options in Crop Sprayer Mode.

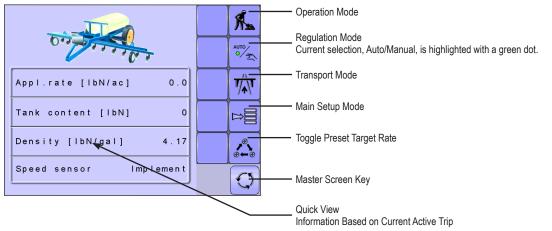
# PAGE LAYOUT AND NAVIGATION

The Master Screen gives access to the systems currently available on your VT. From the Master Screen, the Home Screen gives access to the IC18's available functions.

#### Home Screen

The Home Screen gives access to the IC18's available functions: Operation Mode, Transport Mode and Main Setup.

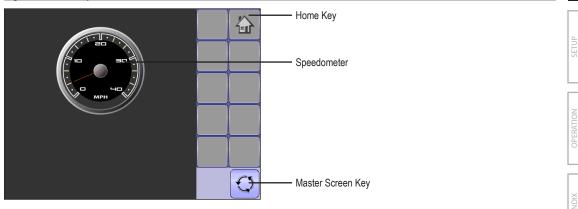
Figure 2-4: Home Screen - NH3 Mode



## **Transport Mode**

While in Transport Mode, all operation functions are locked off and cannot be activated.

Figure 2-5: Transport Mode

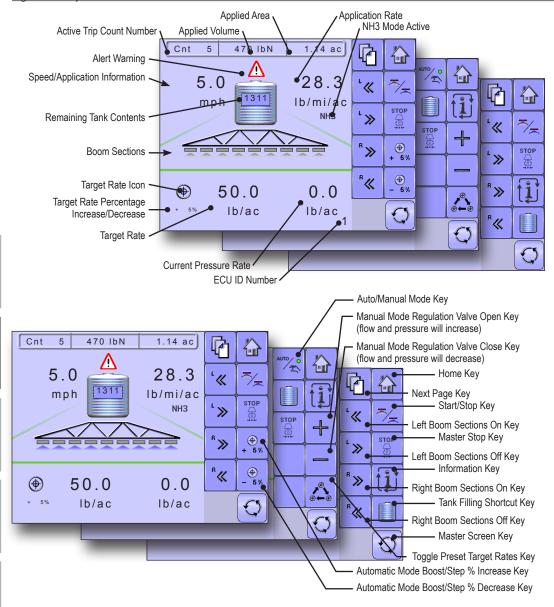


**GETTING STARTED** 

#### **Operation Mode**

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

Figure 2-6: Operation Mode Screen Overview

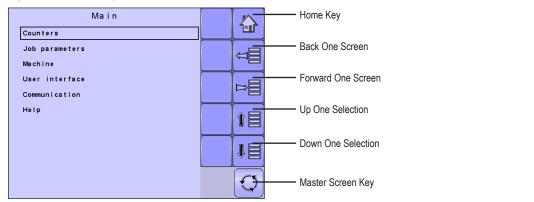


GETTING STARTED

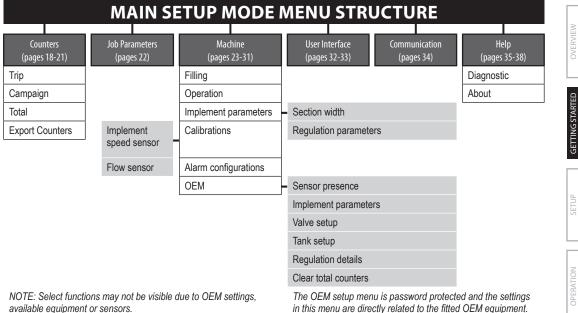
#### Main Setup Mode

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

#### Figure 2-7: Main Setup Screen



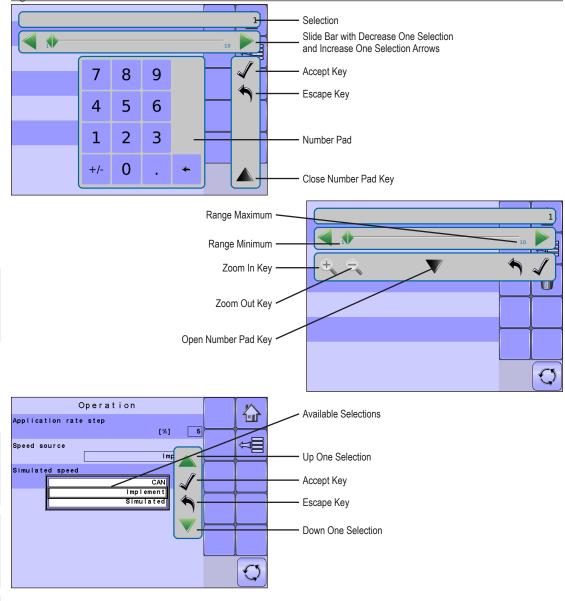
The table below outlines the additional menus and directs you to the setup pages for further information.



in this menu are directly related to the fitted OEM equipment. Refer to the IC18 Sprayer/NH3 OEM Setup Manual for information regarding OEM settings.

#### Main Setup Menu Icons and Section Overviews

Figure 2-8: Enter Selection Screens



GETTING STARTED

Section or Icon	Description
Accept Key 🖌	Accepts the new selection
Close Number Pad Key 🔺	Minimizes the number pad
Decrease One Selection Arrow ┥	Decreases the setting
Down One Selection Arrow 🔻	Highlights the selection below
Escape Key 🔦	Escapes without saving changes
Increase One Selection Arrow	Increases the setting
Number Pad	Use the numbers to set the selection value
Open Number Pad Key 💌	Maximizes the number pad
Selection	Displays the current or new selection
Slider 🔶	Slide to the left to decrease or right to increase the selection
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.
Up One Selection Arrow 🔺	Highlights the selection above
Zoom In Key 🔩 🔩	Narrows slide bar range. Gray = maximum zoom level.
Zoom Out Key 🔍 🔍	Expands slide bar range. Gray = minimum zoom level.

APPENDIX



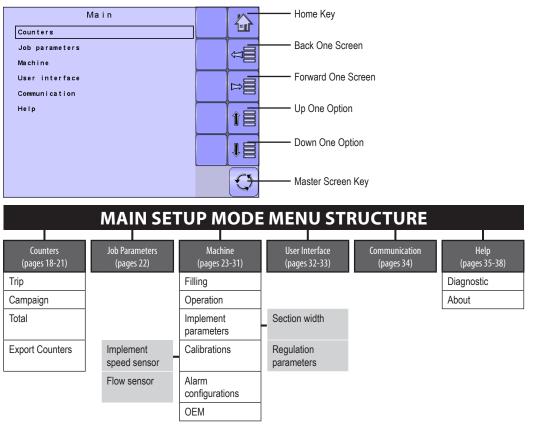
# **CHAPTER 3 – MAIN SETUP IN NH3 MODE**



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 virtual terminal being used.

Figure 3-1: Main Setup Screen



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 Manual for information regarding OEM settings.

## **Main Setup Screen**

NOTE: Settings are NOT automatically saved when selected. The ACCEPT KEY I must be selected to save the setting. Select the ESCAPE KEY to escape without saving settings and return to the previous menu.

To access the Main Setup screens:

- 1. Select IC18 NH3 KEY 🚾 from the Master Screen.
- 2. Select MAIN SETUP SCREEN KEY 🖻 from the Home Screen.
- 3. 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 active trip counter and application rate.
  - ► Machine used to configure machine settings:
    - Filling establishes the amount of material remaining in the tank and the density of that material.
    - Operation establishes Application Rate Step, Speed Source, and Simulated Speed
    - Implement Parameters establishes the Section Width and Regulation Parameters
    - Calibrations establishes either manual or automatic settings of the sensors
    - Alarm Configurations establishes alarms for CAN Speed Source Timeout, Active Trip Count Information mode and Tank Content Minimum
    - 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 Manual for information regarding OEM settings.
  - User Interface used to allow the operator to select the system virtual terminal (VT), switchbox pairing, BoomPilot ECU pairing and soft key numbering as well as view serial numbers and ECU identification numbers:
  - Communication used to establish the IC18's ability to communicate with an external computer:
  - ► Help allows the operator to choose between Diagnostics and the About screen:
    - 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
- NOTE: The menu structure on your display might vary from the one displayed in this User Guide depending on the virtual terminal being used. This User Guide will display all possible options.

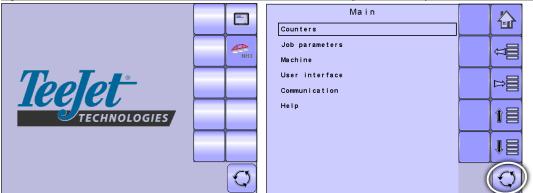
Master Screen Key on Main Setup Screen

## **Master Screen**

The Master Screen gives access to the systems currently available on your VT.

• To view the Master Screen options, select MASTER SCREEN KEY 🖾 in bottom right corner of any screen.

Figure 3-2: Master Screen



## **Home Screen**

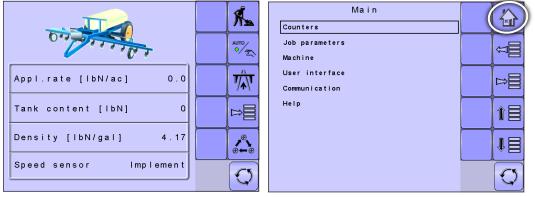
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The Home Screen gives access to the IC18's available functions: Operation Mode, Transport Mode and Main Setup.

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

Figure 3-3: Home 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.

	MAIN SETUP MENU								
Counters	Job Parameters	Machine	User Interface	Communication	Help				
Trip Campaign									
Total									
Export Counters									

- 1. From the Main Setup Screen 📕, select COUNTERS. Figure 3-4: 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
- NOTE: 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.

-		
Counters Job paramete	Main	
Machine	Counters	$\sim$
User interf	Trip	1:1
Communicati Help	Campa i gn	
нетр	Total	
	Export counters	b
		TE
		1
		Ø

APPENDIX

# **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.

#### 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 select the Active Trip Counter, use the number pad or slide bar.
- To clear the Trip Counters, select TRASH CAN KEY 1. A confirmation screen will be displayed.

#### Area Counter

Displays applied coverage area for the selected Active Trip.

#### Distance Counter

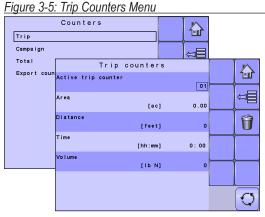
Displays distance traveled for the selected Active Trip.

#### Time Counter

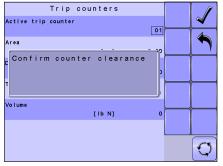
Displays time traveled for the selected Active Trip.

#### Volume Counter

Displays volume of material applied during the selected Active Trip.



#### Figure 3-6: Confirm Counter Clearance



OVERVIEW

# **Campaign Counters**

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

 To clear the Campaign Counters, select TRASH CAN KEY 1. A confirmation screen will be displayed.

#### Area Counter

Displays total applied coverage area for all trips.

#### **Volume Counter**

Displays total volume of material applied during all trips.

#### Time Counter

Displays total time traveled for all trips

## **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.

#### Area Counter

Displays total applied coverage area for all trips.

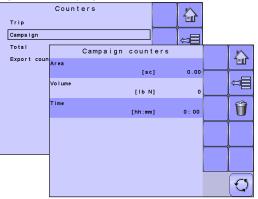
#### Volume Counter

Displays total volume of material applied during all trips.

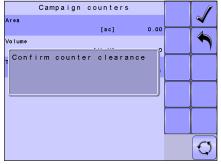
#### Time Counter

Displays total time traveled for all trips.

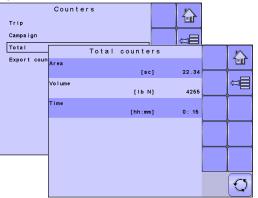
#### Figure 3-7: Campaign Counters



#### Figure 3-8: Confirm Campaign Clearance



#### Figure 3-9: Total Counters



# **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.

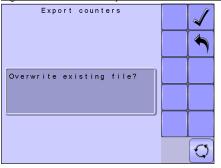
- To export a HTML file, select HTML KEY 🖬 . A confirmation screen will be displayed.
- To export a CSV file, select CSV KEY 🔜 . A confirmation screen will be displayed.

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

#### Figure 3-10: Export Counters



#### Figure 3-11: Confirm Export Counters



# **JOB PARAMETERS**

Job Parameters configures application settings. Options include Active Trip Counter and Preset Application Rates.

# MAIN SETUP MODE MENU STRUCTURE

Machine

Counters

Job Parameters

User Interface

Communication

Figure 3-12: Job Parameters

Help

- 1. From the Main Setup Screen <sup>▶</sup>, select JOB PARAMETERS.
- NOTE: Settings are NOT automatically saved when selected. The ACCEPT KEY I must be selected to save the setting. Select the ESCAPE KEY to escape without saving settings and return to the previous menu.

#### 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.

 To select the Active Trip Counter, use the number pad or slide bar.

	Main	
Counters		
Job paramet	ers 🖉	
Machine	Job parameters	M
User interf	Active trip counter	1-11
Communicati		
Help	Preset appl. rate #1 [IbN/ac]0.0	
	Preset appl. rate #2 [lbN/ac] 0.0	
	Preset appl. rate #3 [lbN/ac] 0.0	
	Preset appl. rate #4 [IbN/ac] 0.0	
	Preset appl. rate #5 [ibN/ac]	Ø

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

#### **Preset Application Rates**

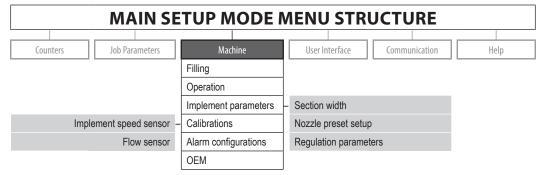
Preset Application Rates define up to five (5) target rates of product being applied per hectare/acre. These settings will set the same for all active trips. Target rates set to "0.0" will not be in included in the TOGGLE PRESET TARGET RATE options 🛆 on the Operation Screen or Home Screen.

• To select the Application Rate, use the number pad or slide bar.

APPENDIX

# MACHINE

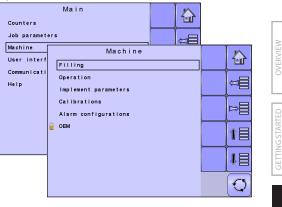
Machine configures machine settings. Options include Filling, Operation, Implement Parameters, Calibrations, Alarm Configurations and OEM.



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

- 1. From the Main Setup Screen <sup>▶</sup>, select MACHINE.
- 2. Select from:
  - Filling establishes the amount of material remaining in the tank and the density of that material.
  - Operation establishes Application Rate Step, Speed Source, and Simulated Speed.
  - Implement Parameters establishes the Section Width and Regulation Parameters.
  - Calibrations establishes either manual or automatic settings of the sensors.
  - Alarm Configurations establishes alarms for CAN Speed Source Timeout, Active Trip Count Information mode and Tank Content Minimum

#### Figure 3-13: Machine



- 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 Manual for information regarding OEM settings.
- NOTE: 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.

# Filling

Filling establishes the amount of material remaining in the tank and the density of that material.

NOTE: The size of the tank is established in the OEM menu. This is the number that will repopulate when the Full Tank Key 1 is pressed. Figure 3-14: Filling

#### Actual Content

Actual Content displays the current volume of content in the tank. The volume can be manually adjusted.

• To adjust thevolume, use the number pad or slide bar.

#### **Density Factor**

Density Factor establishes the weight per volume setting based on the type of fertilizer being used.

• To select the Density Factor, use the number pad or slide bar.

The fertilizer's ability to flow is affected by a number of factors. These factors may vary with each batch and it

may change due to weather (humidity, etc.). In order to accommodate for this, the job computer uses a density factor to compensate for the nature of the applied fertilizer.

#### Full Tank

Full Tank returns the Actual Content volume value to the maximum volume of the tank

To reset the Actual Content value, press the FULL TANK KEY

iguio o i		
Filling Operation	Machine	
Implement p Calibration	IANK FILLING Actual content	
Alarm confi	[Ib N] 11023	
OEM	Density Factor [IbN/gal NH3] 4.17	
		Q

APPENDIX

# Operation

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

#### 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.

• To select the Application Rate Step, use the number pad or slide bar.

#### Speed Source

Speed Source selects whether to base the machine's speed on input from the CAN, an Implement or a Simulated source. Selecting "Implement" will allow for the configuration of pulses per 300 feet / 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.

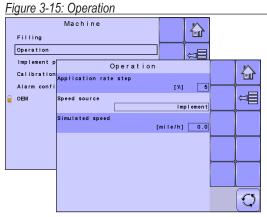
• To select the Speed Source, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

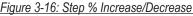
NOTE: If "Implement" is selected, refer to the Calibrations section for further instructions.

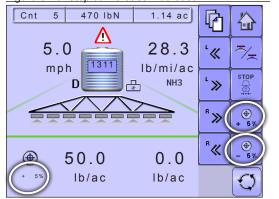
#### Simulated Speed

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

• To select the Simulated Speed, use the number pad or slide bar.







## **Implement Parameters**

Implement Parameters establishes the following:

- Section Width sets the spraying width during application.
- Regulation Parameters establishes adjustments to the rough and fine valve calibrations.

## **Section Width**

Section Width sets the spraying width during application.

#### **Boom Section Width**

Section Width establishes the boom sections widths for each boom section.

- NOTE: The number of boom sections available is set on the Implement Parameters screen in the OEM section.
  - To select the Boom Section Width, use the number pad or slide bar.

#### **One-Touch Equal Widths**

One-Touch Equal Widths sets all boom section widths to the value set for #1 Boom Section.

 To set all boom section widths, press the EQUAL SECTION WIDTH KEY

#### **Regulation Parameters**

Regulation Parameters establishes adjustments to the valve calibrations.

NOTE: Adjusting the Valve Calibration settings involves significant changes and adjustments should therefore be made in small steps.

#### Valve Calibration, Rough

Rough regulation value calibration allows you to regulate the speed of the pressure regulating valve to accommodate different application needs. Operating conditions may necessitate a higher or lower response

# Figure 3-17: Implement parameters Machine Filling Operation Implement p Calibration Alarm confi Regulation parameters

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18

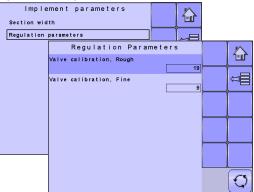
 $\mathfrak{O}$ 

#### Figure 3-18: Section Width

OEN

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lmple	eme	en	t pa	ramete	ers		$\left  \right\rangle$	
Section wid	lth							
Regulation	par	am	eters					
				Sect	ion wid	t h		
	#	1	Boom	section		[inch]	118	1-11
	#	2	Boom	section		[inch]	118	
	#	3	Boom	section		[inch]	118	
	#	4	Boom	section		[inch]	118	
	#	5	Boom	section		[inch]	118	Q <u>Q</u> Q
	#	6	Boom	section		[inch]	118	
	#	7	Boom	section		[inch]	118	
	#	8	Boom	section		[inch]	118	
	#	9	Boom	section		[inch]	118	
								$\odot$

#### Figure 3-19: Regulation Parameters



speed for the regulating valve. This value sets the speed for coarse adjustments in relation to a large percentage outside of the target application rate

- ▶ If the system is too slow in finding the correct rate, the values should be increased.
- ▶ If the system is too unstable, the values should be decreased.
  - To select the Valve Calibration, Rough, use the number pad or slide bar.

If your system is plumbed in a bypass mode, the valve speed number of 9 works very well in most applications If your system is plumbed in a throttling mode, start with a valve speed number of 3 and adjust the number according to your application requirements. Low fl ow situations will require a slower response time. Adjusting agitation volumes to accommodate the regulating valve to work in a more fully open position allows for a faster response time, with little to no searching.

NOTE: This speed value can be adjusted to optimize system performance. If you notice that the valve seems to "search" for the programmed application rate by cycling the pressure up and down continuously, reduce the number until the "searching" is minimized or eliminated. Conversely, a higher number will increase the valve response speed and speed up the rate of adjustment.

#### Valve Calibration, Fine

Fine regulation value calibration allows you to regulate the speed of the pressure regulating valve to accommodate different application needs. Operating conditions may necessitate a higher or lower response speed for the regulating valve. This digit sets the speed for the fine tune adjustment in relation to a small percentage close to the target application rate.

- ▶ If the system is too slow in finding the correct rate, the values should be increased.
- ▶ If the system is too unstable, the values should be decreased.
  - To select the Valve Calibration, Fine, use the number pad or slide bar.

If your system is plumbed in a bypass mode, the valve speed number of 5 works very well in most applications. If your system is plumbed in a throttling mode, start with a valve speed number of 3 and adjust the number according to your application requirements. Low flow situations will require a slower response time. Adjusting agitation volumes to accommodate the regulating valve to work in a more fully open position allows for a faster response time, with little to no searching.

NOTE: This speed value can be adjusted to optimize system performance. If you notice that the valve seems to "search" for the programmed application rate by cycling the pressure up and down continuously, reduce the number until the "searching" is minimized or eliminated. Conversely, a higher number will increase the valve response speed and speed up the rate of adjustment.

# Calibrations

Calibrations establishes either manual or automatic settings of the sensors.

NOTE: For specific calibration options to appear, a specific sensor needs to be installed. Sensor availability is activated on the Sensor Presence screen in the OEM section.

#### **Implement Speed Sensor**

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

#### Manual Calibration

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

• To select the Pulses per Distance, use the number pad or slide bar.

#### Automatic Calibration

Automatic calibration establishes the pulses using the automatic calibration function.

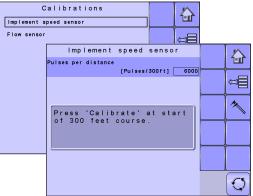
- To calibrate the pulses per distance, select CALIBRATION KEY 🔊 .
- · Follow the series of instructions displayed.
- Select the ACCEPT KEY  $\checkmark$  to complete the calibration

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

#### Figure 3-20: Calibrations

Filling Operation	Machine	
Implement p Calibration Alarm confi OEM	Calibrations Implement speed sensor Flow sensor	
		Û IJ
		₽
		Î
		1
		Q

Figure 3-21: Implement Speed Sensor



## **Flow Sensor**

The Flow Sensor establishes the impluses per gallon/ liter. This value can be established manually or calibrated automatically.

#### Manual Calibration

Manual calibration establishes the calibration and limits based on user entered values.

- To select the Flow Meter Calibration, use the number pad or slide bar.
- To select the Low Limit, use the number pad or slide bar.
- To select the High Limit, use the number pad or slide bar.

#### Automatic Calibration

If the number of pulses per gallon/liter for the flow meter is not known or to make sure the value is correct, automatic calibration establishes the calibration and limits.

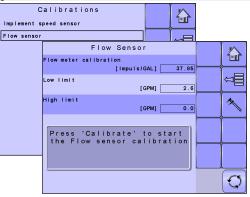
- To calibrate the flow sensor, select CALIBRATION KEY <a>\_\_\_\_\_\_.</a>
- Follow the series of instructions displayed.
- Select the ACCEPT KEY ✓ to complete the calibration

The impulses counted will be displayed during the automatic calibration.

An option to enter a Collected Volume is displayed if there is no calculated volume.

• To enter the Collected Volume, use the number pad or slide bar.





# **Alarm Configurations**

Alarm Configurations establishes alarms for CAN Speed Source Timeout, Active Trip Count Information mode and Tank Content Minimum.

#### **CAN Speed Source Timeout**

CAN Speed Source Timeout establishes how long the system can operate after the CAN speed source input is lost and the alarm is triggered.

• To select the CAN Speed Source Timeout time, use the number pad or slide bar.

#### Active Trip Count Information

Active Trip Count Information sets the associated alarm to on or off.

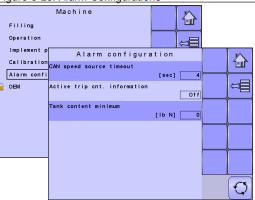
 To select the Active Trip Count Information mode, select an option from the drop down menu or use the UP/ DOWN ARROWS to highlight the option.

#### Tank Content Minimum

Tank Content Minimum establishes the minimum volume level at which an alarm will sound. Without a Tank Sensor, the minimum is determined by calculating the difference between the established actual tank content volume and the calculated applied content volume. With a Tank Sensor, the minimum is directly related to the sensor reading.

• To select the volume, use the number pad or slide bar.

#### Figure 3-23: Alarm Configurations

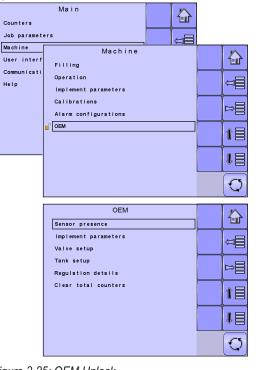


### OEM

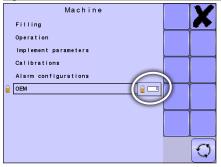
The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. To obtain an access code, contact your local dealer or TeeJet Technologies Customer Service. To access the OEM screens:

- 1. From the Main Setup Screen <sup>■</sup>, 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:
  - Sensor presence used to establish sensors for Flow and Liquid Pressure
  - Implement parameters used to establish the Sprayer Mode and Number of Sections
  - Valve setup used to establish the Regulation Valve Type and Section Valve Behavior
  - Tank setup used to establish maximum and minimum tank content
  - Regulation details used to adjust the control of the regulation valve
  - Clear total counters used to delete the Total Count system counter for Area, Volume and Time back to the default settings
- NOTE: 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. OEM

#### Figure 3-24: Machine to OEM



#### Figure 3-25: OEM Unlock



### **USER INTERFACE**

User Interface allows the operator to select the system virtual terminal (VT), switchbox pairing, BoomPilot ECU pairing and soft key numbering as well as view serial numbers and ECU identification number.



- 1. From the Main Setup Screen <sup>□</sup>, select USER INTERFACE.
- NOTE: 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.

### Use Preferred VT

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

#### Figure 3-26: User Interface

	Main	
Counters		
Job paramet	ers	
Machine	User interf	ace 🔊
User interf	Use preferred VT	1-11
Communicati		Off
Help	This IC18: S/N: 10013059 ECU I	ID: 1069
	Pair with switchbox ECU I	ID: Auto
	Pair with BoomPilot ECU ECU I	ID: Auto
	Currently paired with: SwBox: 2097151 BPEC	CU: none
	Show number on soft key	No C

NOTE: This should always be set to "off" unless another VT is on the CAN bus.

• To set the Use Preferred VT mode, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

#### This IC18 Information

Displays IC18's serial number and associated ECU identification number.

#### Pair with Switchbox

The pairing of a switchbox can be set to be done automatically, not at all or to a specific switchbox ECU ID number on the CAN network.

• To set the Switchbox pairing, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

#### Pair with BoomPilot ECU

The pairing of a BoomPilot ECU can be set to be done automatically, not at all or to a specific BoomPilot ECU ID number on the CAN network.

• To set the BoomPilot ECU pairing, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

#### **Currently Paired With Information**

Displays the current ECU ID numbers for a paired switchbox or BoomPilot ECU.

- If no switchbox or BoomPilot ECU is on the system, "none" will be shown.
- If a specific switchbox or BoomPilot ECU has been chosen to be paired with and it is not available on the system, "none" will be shown.

#### Show Number on Soft Key

Show Number on Soft Key establishes if a user assigned identification number will be visible on the Master Screen, Home Screen and Operation Screen.

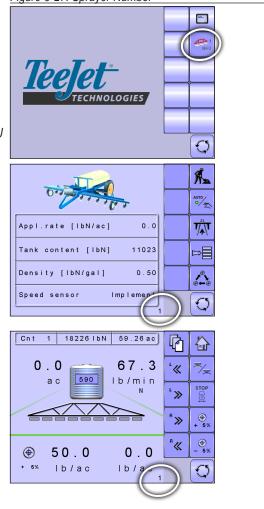
- To set the Soft Key Number mode, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.
- NOTE: Typically used only if more than one (1) IC18 ECU is on the CAN bus.

#### Sprayer Number (FI)

Sprayer Number is the identification number referring specifically to the IC18 ECU referenced under the "This IC18" information row on the User Interface screen.

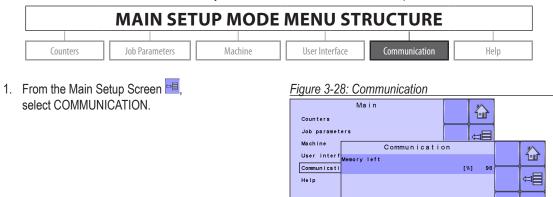
• To set the Sprayer Number, use the number pad or slide bar.

Figure 3-27: Sprayer Number



### COMMUNICATION

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



PC communication is enabled until you leave this page.

Ø

OVERVIEW

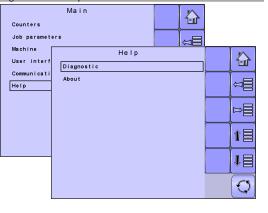
### HELP

The Help menu allows the operator to choose between Diagnostics and the display of information about serial number, CAN BUS information, etc. These menus are typically accessed upon Customer Service personnel request only.

MAIN SETUP MODE MENU STRUCTURE						
Counters	Job Parameters	Machine	User Interface	Communication	Help	
					Diagnostic	
					About	

- 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, build number, etc.
- NOTE: Settings are NOT automatically saved when selected. The ACCEPT KEY I must be selected to save the setting. Select the ESCAPE KEY to escape without saving settings and return to the previous menu.

#### Figure 3-29: 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 sets the Liquid Valve PWM Dutycycle percentage as well as if Liquid Valve Direction, Master Valve, Fill Valve and Section Valves 1-9 are on or off.
- VT provides information regarding the virtual terminal controller.
- ► TECU provides information regarding the TECU.

### **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 1.

#### Figure 3-30: Diagnostic

Diagnostic About	Help	
	Diagnostic Test input	
	Test output VT	Ţ]
	TECU	₽
		<b>î</b> E
		$[\mathcal{Q}]$

#### Figure 3-31: Test Input

	Diagnostic				
Test input					
Test output				Â	
VT	Test	input			$\sim$
TECU	Implement speed				1-11
			High	0	
	Flow sensor		High	o	₽Ţ
					8
					CS
					U)

APPENDIX

### Test Output

Test Output sets the Liquid Valve PWM Dutycycle percentage as well as if Liquid Valve Direction, Master Valve, Fill Valve and Section Valves 1-9 are on or off.

#### Liquid Valve PWM Dutycycle

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

• To set the Liquid Valve PWM Dutycycle, use the number pad or slide bar.

#### Liquid Valve Direction

Liquid Valve Direction is used to verify the option of the Liquid valve direction is correct to a specific duty cycle.

- Set the Liquid Valve PWM dutycycle to the percentage to be tested.
- Change the Liquid valve direction to "on" and the liquid valve will open at the specific dutycycle.
- Change it back to off and the valve will close.

#### Master Valve

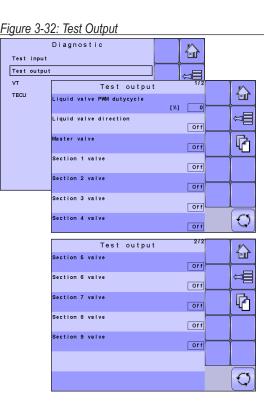
Master Valve is used to test if the Master Valve is operating correctly. If you change the setting to "on", the valve will open, change it to "off" and the valve will close.

• To set the Master Valve, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

#### Section Valves

Section Valves is used to test if the section Valve is operating correctly. If you change the setting to "on", the valve will open, change it to "off" and the valve will close.

• To set the Section Valves, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.



### VT Data

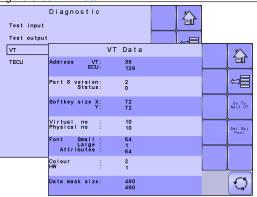
The Virtual Terminal (VT) menu provides information regarding the virtual terminal controller (i.e., address version, etc.).

- If more terminals/controllers are used, switch between these by pressing the GO TO NEXT VT KEY
- Press the DELETE OBJECT POOL KEY to delete saved information on the VT. This forces the VT to upload all information from the IC18 on the next power cycle.
- NOTE: Restart the IC18 Job Computer to implement and display changes.

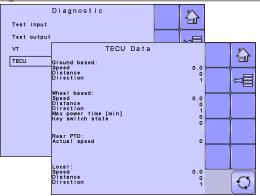
### TECU

The TECU is a control unit, residing on the tractor, that performs basic functions such as power handling, speed info, etc. The TECU data are displayed on this page.

#### Figure 3-33: VT Data



#### Figure 3-34: TECU



### 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 3-35: About

	Help	
Diagnostic		
About		
	About	$\wedge$
	Software version	
	1.05x.00684	
	ECU board S/N 10013059	Ĵ0
	ECU Board Ver. 31	
	I/O board IC18 sprayer/Ver. 3	
	BUS ID PLP: 0 ISO: 1069	
	ISO 11783, OEM name TeeJet Technologies	
	ISO 11783, Man. code 109	$\bigcirc$

# CHAPTER 4 – 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 virtual terminal being used.

### **AUTOMATIC OR MANUAL REGULATION MODE**

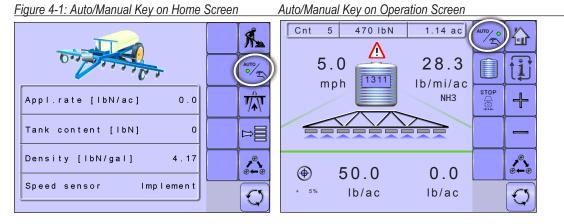
Automatic regulation mode will automatically adjust the application rate based on the current speed in reference to the target rate. The target rate can be adjusted using the Boost/Step % Increase/Decrease Keys 🕵 🔊 on the Operation Screen. Preset Application Rates define up to five (5) target rates for product being applied per hectare/acre. These can be toggled using the Toggle Preset Target Rate Key 🛆 on the Operation Screen or Home Screen.

Manual regulation mode will retain an established regulation valve setting regardless of speed. The regulation valve setting can be adjusted using the Regulation Valve Open/Close Keys + - on the Operation Screen.

If a switchbox is being used to control the boom sections, automatic or manual regulation mode can be set on the Operation Screen.

When using the IC18, not a switchbox, for boom section control, automatic or manual regulation mode needs to be established on the Home Screen before entering Operation Mode.

1. On the Home Screen in or Operation Screen is, establish Automatic Operation Mode or Manual Operation Mode by pressing the AUTO/MANUAL KEY is so that the green dot is on AUTO (automatic) or the hand (manual) accordingly.



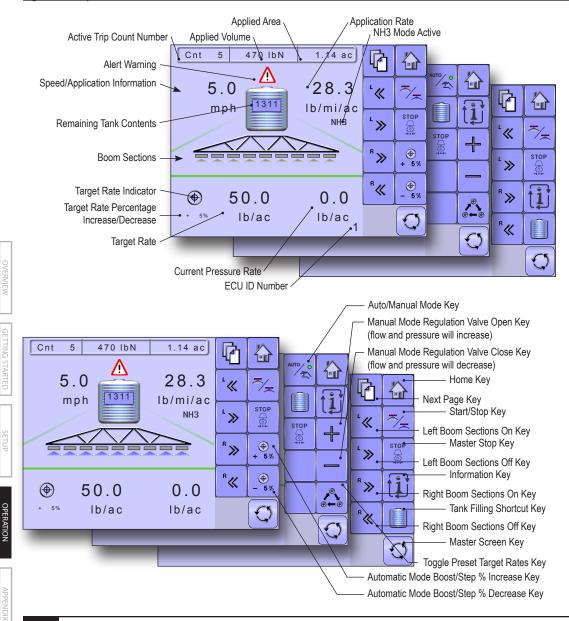
SETUP

**OPERATION** 

### **OPERATION MODE OVERVIEW**

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

Figure 4-2: Operation Mode Screen Overview



# **ISOBUS Job Computer : IC18 NH3**

### **Keys Descriptions**

lcon		Description				
	Home Key	Press to return to the Home Screen				
~ <u>,</u>	Start/Stop Key	Press to start or stop application				
i	Information Key	Press to toggle between display modes				
(⊕) + 5% - 5%	Boost/Step Percentage Increase/ Decrease Keys	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				
+ -	Manual Mode Regulation Valve Open Keys	Press + to open the regulation valve Press - to close the regulation valve				
<b>●</b> ● <del>–</del> ●	Toggle Preset Target Rates Key	Press to toggle between established target application rates				
AUTO •	Auto/Manual	Press to toggle between automatic and manual application modes.				
	Key	Automatic regulation mode will automatically adjust the application rate based on the current speed in reference to the target rate.				
		Manual regulation mode will retain an established regulation valve setting regardless of speed.				
	Tank Filling Shortcut Key	Press for one-press access to the Tank Filling setup screen				
STOP	Master Stop Key	Press to stop all application, close all regulation valves and change to manual regulation mode				
b	Next Page Key	Press to toggle between soft key options				
<sup>⊥</sup> ≪ <sup>ℝ</sup> ≫	<ul> <li>Boom</li> <li>Sections</li> <li><sup>®</sup>≪ On/Off</li> <li>Keys</li> </ul>	Press to turn on sections to left <u>*</u> , turn off sections from left <u>*</u> , turn on sections to right <u>*</u> or turn off sections from right <u>*</u>				

### **Section and Icon Descriptions**

Section or Icon	Description					
Job Information	This information bar displays the active count number, applied volume and applied area					
Count Number	Displays the current active trip or job number					
Applied Volume	Displays volume applied for the selected count number					
Applied Area	Displays applied area for the selected count number					
Speed/ApplicationDisplays vehicle speed or volume applied per minute or projected area per ho be covered or projected total area remaining to be covered depending upon v view is active.The Information Key toggles []] between display modes.						
Remaining Tank Contents	Displays the remaining tank content NOTE: If the contents are not entered in the Tank Filling Menu prior to applying, Tank Contents may not display the correct amount.					
Application Rate	Displays the actual application rate per hectare/acre					
Alarm <u>A</u>	Displayed if an alarm condition is active					
Boom Sections	Displays the active and inactive boom sections as well as if they are on sections as well as if they are on sections as blue) or off (spray is gray).					
NH3 Mode Active NH3	Displays if the unit is in NH3 mode.					
Pressure Range	This information section displays the target pressure and the current working pressure.					
Target Rate	Displays the current targe rate					
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					
Current Pressure Rate	Displays the current pressure to the nozzle					
ECU ID Number	Displays the soft key number assigned to the displayed IC18 ECU.					

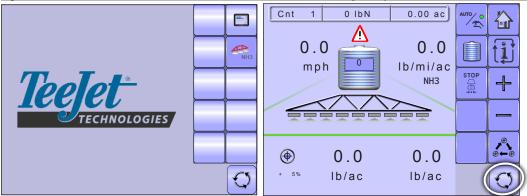
### **Master Screen**

The Master Screen gives access to the systems currently available on your VT.

• To view the Master Screen options, select MASTER SCREEN KEY 🖾 in bottom right corner of any screen.

Figure 4-3: Master Screen

Master Screen Key on Operation Mode Screen



### **Home Screen**

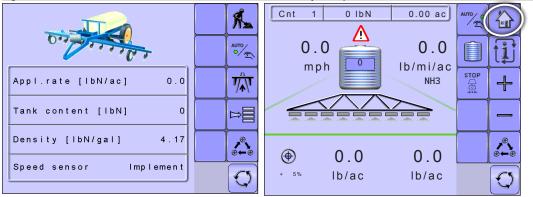
谷

The Home Screen gives access to the IC18's available functions: Operation Mode, Transport Mode and Main Setup.

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

Figure 4-4: Home Screen

Home Key on Operation Mode Screen



SETUP

**OPERATION** 

### **APPLICATION RATE OPTIONS**

### Target Rate Percentage Increase/Decrease

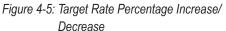
Target Rate Percentage Increase/Decrease Keys increase/decrease the application target rate per the established percentage set in the Machine Operation setup screen under Application Rate Step. Automatic regulation mode will automatically adjust the application rate based on the current speed in reference to the target rate. Preset Application Rates define up to five (5) target rates of product being applied per hectare/acre. These can be toggled using the Toggle Preset Target Rate Key in on the Operation Screen or Home Screen.

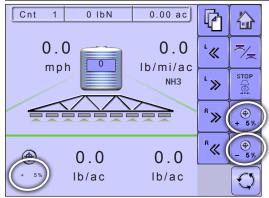
• To adjust the Target Rate, press the BOOST/STEP % INCREASE/DECREASE KEYS .

### Regulation Valve Manual Open/Close

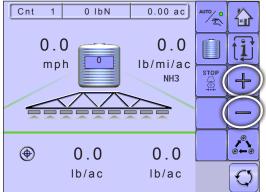
The regulation valve setting can be adjusted using the Regulation Valve Open/Close Keys + - on the Operation Screen. Manual regulation mode will retain an established regulation valve setting regardless of speed.

 To adjust the regulation valve, press the REGULATION VALVE OPEN/CLOSE KEYS + -





#### Figure 4-6: Regulation Valve Manual Open/Close



### **Target Rate**

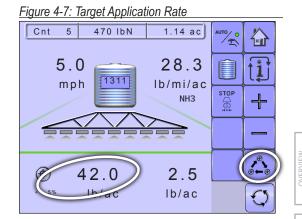
Preset Application Rates define up to five (5) target rates of product being applied per hectare/acre. These settings will set the same for all active trips. Target rates set to "0.0" will not be included in the toggle preset target rate options  $\triangle$  on the Operation Screen or Home Screen.

If a switchbox is being used to control the boom sections, current target application rate can be set on the Operation Screen.

When a switchbox is not connected to the system current target application rate needs to be established on the Home Screen before entering Operation Mode.

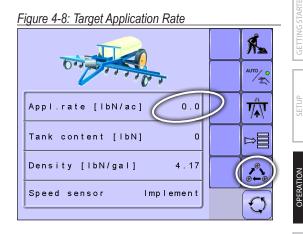
### With Switchbox

 To toggle between Target Application Rates, press the TOGGLE PRESET TARGET RATE KEY .



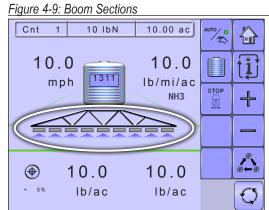
#### Without Switchbox

 To toggle between Target Application Rates, press the TOGGLE PRESET TARGET RATE KEY .



### **BOOM SECTIONS**

Boom Sections displays the active ' and inactive ' boom sections as well as if they are on ' (spray is blue) or off ' (spray is gray).





APPENDIX

### **On/Off Sections from the Left or Right**

When a switchbox is not connected for boom section control, booms sections are controlled using the Boom Sections On/Off Keys.

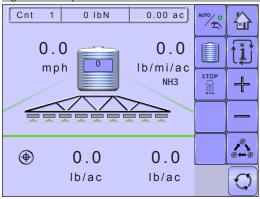
### Without Switchbox

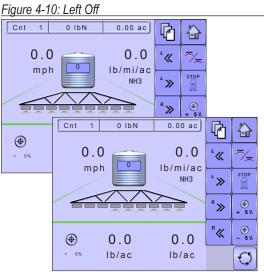
- To adjust the sections on the left, press the LEFT BOOM SECTIONS ON/OFF KEYS '« '» .
- To adjust the sections on the right, press the RIGHT BOOM SECTIONS ON/OFF KEYS S

### With Switchbox

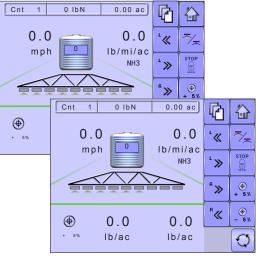
If a switchbox is being used to control the boom sections, boom sections will be controlled by the switchbox.

Figure 4-12: Operations Screen With Switchbox





#### Figure 4-11: Right Off



98-05230 R0 US

SETUP

**OPERATION** 

### **Start/Stop Application**

When a switchbox is not connected for boom section control, starting/stopping application is controlled using the Start/Stop Key.

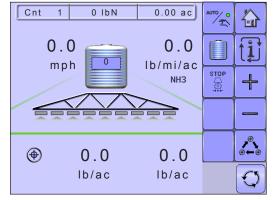
### Without Switchbox

 To start or stop the application, press the START/ STOP KEY <u>></u>.

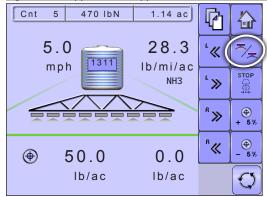
#### With Switchbox

If a switchbox is being used to control the boom sections, starting/stopping application will be controlled by the switchbox.

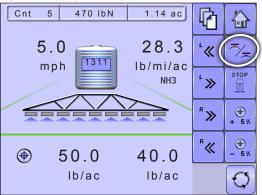
Figure 4-15: Operations Screen With Switchbox



#### Figure 4-13: Application Stopped



#### Figure 4-14: Application Started



OPERATION

### **Master Stop Key**

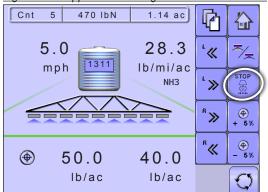
Master Stop Key is used to stop all application, close all regulation valves and change to manual regulation mode.

 To stop all application, close all regulation valves and change to manual regulation mode, press the STOP KEY Z

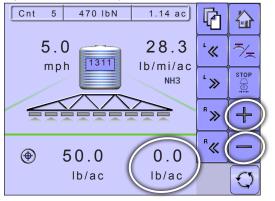
### With Switchbox

If a switchbox is being used to control the boom sections, the Master Stop Key will override the Master Switch on the switchbox and turn off any boom application in progress.

#### Figure 4-16: Application In Progress



#### Figure 4-17: Master Stop Pressed

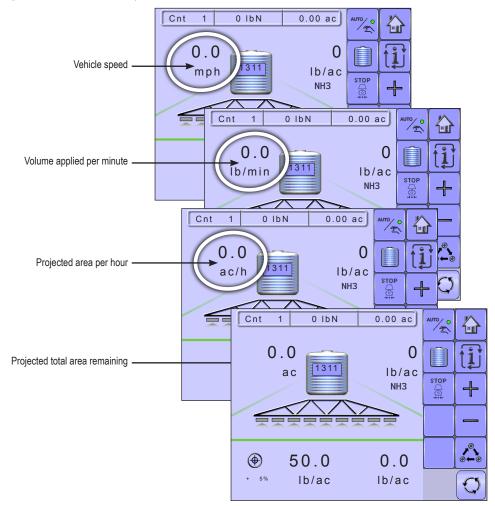


### **INFORMATION KEY**

Information Key toggles the Speed/Application Information section on the Operation Screen between the display modes.

- · Vehicle speed
- · Volume applied per minute
- · Projected area per hour to be covered based on current speed, target rate and tank level
- · Projected total area remaining to be covered based on current target rate and current tank level

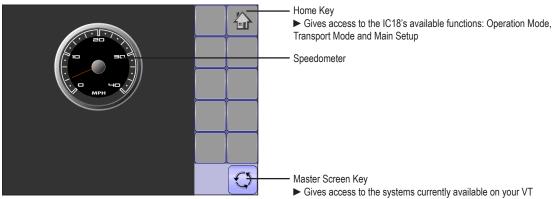
#### Figure 4-18: Information Key



### **TRANSPORT MODE**

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

Figure 4-19: Transport Mode





# **ISOBUS Job Computer : IC18 NH3**

## **APPENDIX A - FACTORY SETTINGS & RANGES**

### **JOB PARAMETERS**

JOB PARAMETERS						
Description	Factory Setting	Range	User Setting			
Active Trip Counter	1	1 - 10	1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
Preset Application Rate #1	0.0 GPA (US)	0.0 - 700.6 (US)	#1			
Preset Application Rate #2	0.0 l/ha	0.0 - 6553	#2			
Preset Application Rate #3	0.0 GPA (UK)	0.0 - 583.4 (UK)	#3			
Preset Application Rate #4			#4			
Preset Application Rate #5			#5			

### MACHINE

### **Tank Filling**

Description	Factory Setting	Range/Options	User Setting		
Actual Content	0 lbN (US)	0 - 12000 (US)			SETUP
	0 kgN	0 - 5443		ľ	/1
	0 lbN (UK)	0 - 12000 (UK)		L	_
Density Factor	6.68 lb/Gal (US)	6.68 - 16.69 (US)			_
	0.80 kg/l	0.80 - 2.00		0	<b>OPERATION</b>
	8.02 lb/Gal (UK)	8.02 - 20.04 (UK)			OPEH

APPENDIX

### Operation

Description	Factory Setting	Range/Options	User Setting
Application Rate Step	5%	1 - 20	
Speed Source	CAN	CAN	
		Implement	
		Simulated	
Simulated Speed	0.0 mile/h / km/h	0.0 - 99.9	

### **Implement Parameters**

#### **Section Width**

Description	Factory Setting	Range	User Setting
Section Width	118 in. / 300 cm	1 - 9999	

### **Regulation Parameters**

Description	Factory Setting	Range	User Setting
Valve Calibration, Rough	19	1 - 19	
Valve Calibration, Fine	9	1 - 9	

### Calibrations

### **Implement Speed Sensor**

Description	Factory Setting	Range/Options	User Setting
Pulses per Distance	0	0 - 33445	

### **Alarm Configurations**

Description	Factory Setting	Range/Options	User Setting
CAN Speed Source Timeout	4 sec	0 - 999	
Active Trip Count Imformtaion	Off	Off	
		On	
Tank Content Minimum	0 GAL (US)	0 - 2641 (US)	
	0 liters	0 - 9999	
	0 GAL (UK)	0 - 2199 (UK)	

# **ISOBUS Job Computer : IC18 NH3**

### **USER INTERFACE**

USER INTERFACE				
Description	Factory Setting	Range/Options	User Setting	
Use Perferred VT	Off	Off		
		On		
Pair with Switchbox	Auto	Auto		
		None		
		< <specific #="" id="">&gt;</specific>		
Pair with BoomPilot ECU	Auto	Auto		
		None		
		< <specific #="" id="">&gt;</specific>		
Show Number on Soft Key	No	No		
		Yes		
Sprayer Number (FI)	1	1 - 9		

# **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 Requirem	ent	<9 watts @12 VDC

# IC18 NH3 JOB COMPUTER USER MANUAL

Software Version 1.05





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