

# RADION AUTOMATIC SPRAYER CONTROL

## SIMPLIFIED REFERENCE GUIDE

Software Version 1.00



**TeeJet**<sup>®</sup>  
TECHNOLOGIES

A Subsidiary of  Spraying Systems Co.<sup>®</sup>

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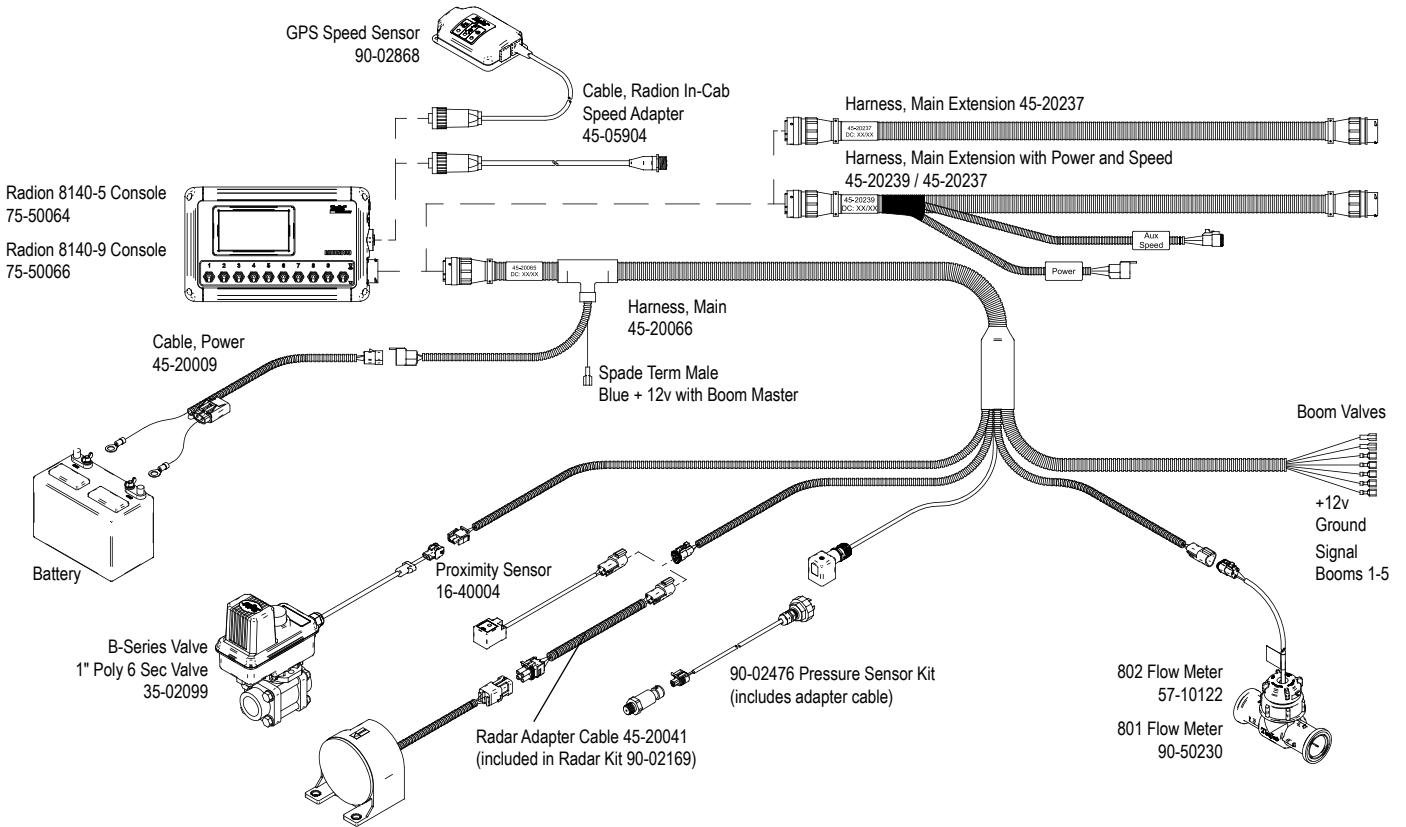
## SYSTEM DIAGRAM

### Computer-Controlled Spraying Has Never Been So Easy


Designed with simplicity in mind, Radion offers spraying advantages not found in other controllers. Simply set your target application rate and the unique VisiFlo® display on the controller helps select the right TeeJet tip for the application. Once spraying begins, the large display shows application rate, volume sprayed, system pressure, sprayer speed, and area covered.

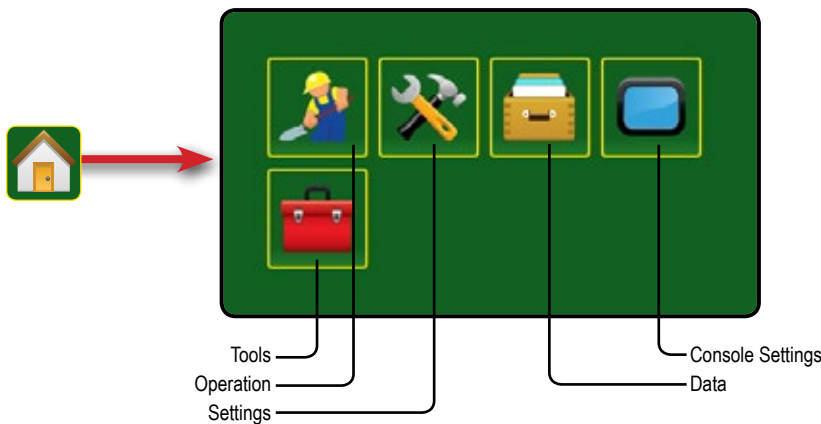
Radion's built-in planning tool automatically displays the available speed range for the target rate and spray tip that have been selected. This unique visual planning tool makes choosing the correct spray tip for an application a quick and simple task. Radion is available as an individual controller, or in a complete package with the valves, cables, and sensors needed to put together a total sprayer control system.

Figure 1-1: System Diagram




## HOME

 The Home screen gives access to the Operation, Settings, Data, Console and Tools screens.



# Radion 8140 Automatic Sprayer Control

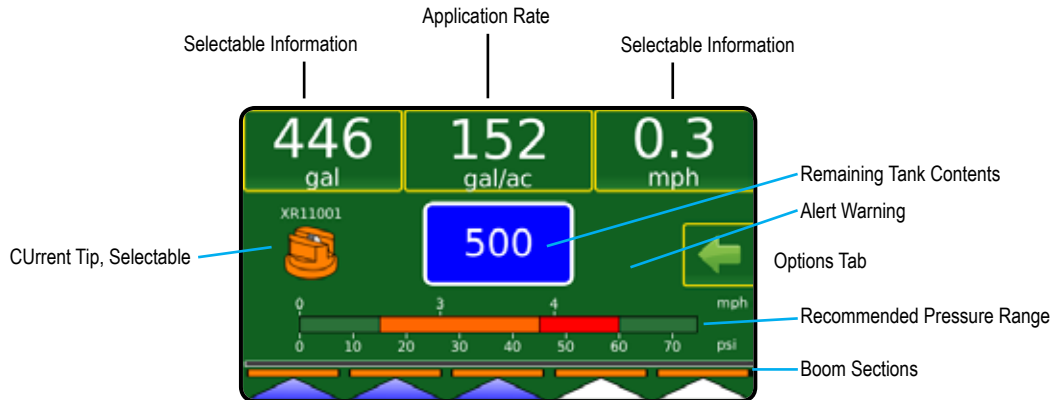
## OPERATION

 If there are questions concerning the operation of the Radion system, or due to the changes in component specifications the parts supplied in the kit are not exactly as presented in this document, please contact your dealer or TeeJet Customer service representative for clarification before operation. TeeJet Technologies is not responsible for misuse or incorrect operation of the system.

*NOTE: Settings are automatically saved when selected.*

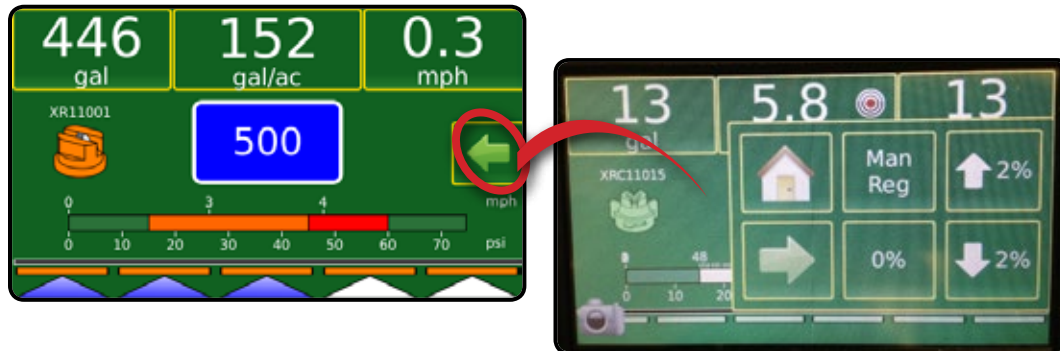
*NOTE: The menu structure on your display might vary from the one displayed in this User Manual depending on the virtual terminal being used.*

Figure 1-2: Overview of the Operation screen



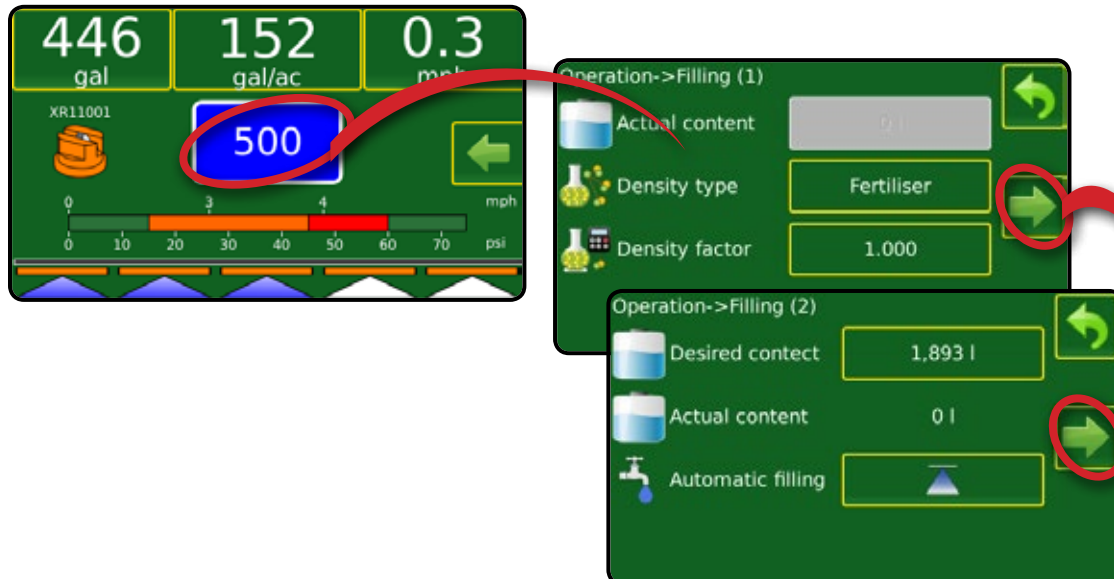
### Options Tab

Figure 1-3: Option Tab



### Tank Filling

Figure 1-4: Tank Filling



# Radion 8140 Automatic Sprayer Control

## 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 buttons on the OPTIONS tab. Preset Application Rates define up to three (3) target rates for product being applied per hectare/acre. These can be toggled using the Application rate box at the top of the Operation Screen.

Manual regulation mode will retain an established regulation valve setting regardless of speed. The regulation valve setting can be adjusted using the UP/DOWN arrows on the OPTIONS tab.

Figure 1-5: Auto/Manual button on Options tab



## 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).

The color on the boom sections indicates the color of the selected tip series.


Established Tip Sizes and Colors			
Size	Color	Size	Color
01	Orange	05	Brown
015	Green	06	Gray
02	Yellow	08	White
025	Purple	10	Light Blue
03	Blue	15	Light Green
04	Red	20	Black

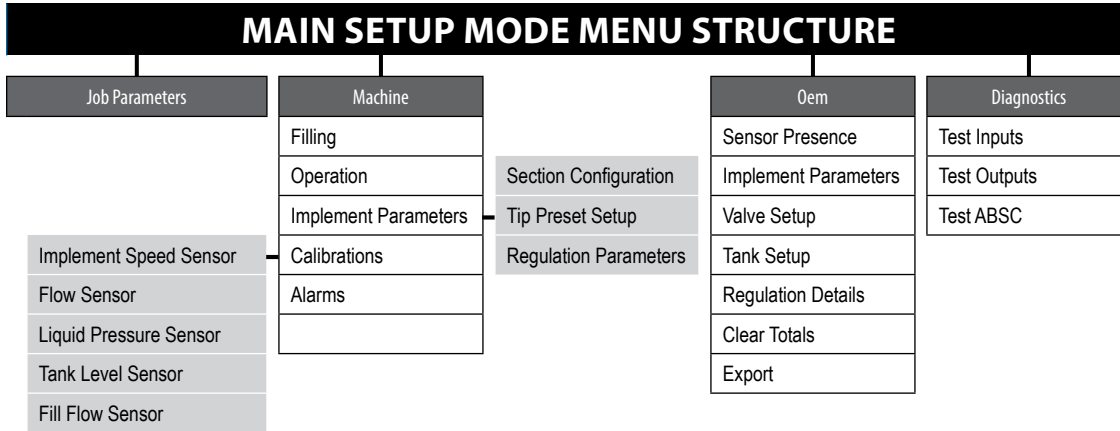
Figure 1-6: Boom Sections



# Radion 8140 Automatic Sprayer Control

## SETUP

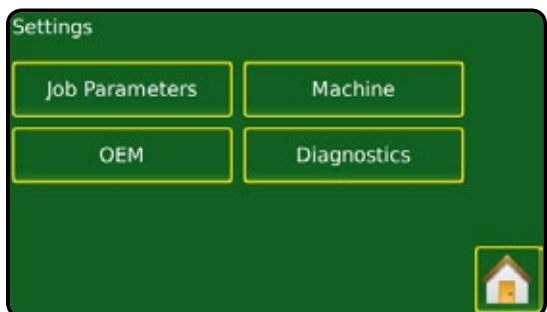
 The main setup menu contains four options. Each of these options either directly access settings or additional menus.



*NOTE: Select functions may not be visible due to OEM settings, available equipment or sensors.*

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

- ▶ JobParameters – used to configure application settings including preset application rate and tip series.
- ▶ Machine – used to configure machine settings:
  - ◀ Filling – establishes the amount of actual and desired material in the tank and the density of that material.
  - ◀ Operation – establishes application rate step, speed source, simulated speed and minimum speed
  - ◀ Implement Parameters – establishes the section configuration, tip preset setup and regulation parameters
  - ◀ Calibrations – establishes either manual or automatic settings of the sensors
  - ◀ Alarms – establishes alarms on or off or 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 Manual for information regarding OEM settings.
  - ◀ Sensor Presence – used to establish sensors for Flow, Liquid Pressure, Fill Flow and the Tank
  - ◀ Implement Parameters – used to establish the number of sections and circulation
  - ◀ Valve Setup – used to establish the regulation valve type, section valve behavior and section valve type
  - ◀ Tank Setup – used to establish maximum and minimum tank content, auto filling mode and auto filling offset value
  - ◀ Regulation Details – used to adjust the control of the regulation valve
  - ◀ Clear Total – used to delete the total count system counter for area, volume and time back to the default settings
  - ◀ Import/Export – used to import or export settings
- ▶ Diagnostic – used to troubleshoot input/output of the controller (sensor or actuator) or ABSC.
  - ◀ Test Inputs – displays the input high and low values on the installed sensors
  - ◀ Test Outputs – sets the Liquid Valve PWM Duty cycle percentage as well as if Master Valve, Fill Valve and Section Valves are on or off
  - ◀ Test ABSC – displays automatic boom section control correction, mode and section input status. (Only available when feature is unlocked.)

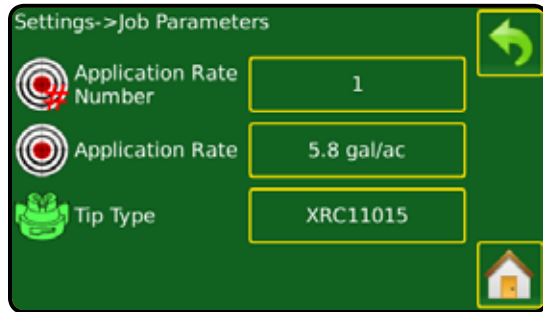




## JOB PARAMETERS

Job Parameters configures application settings. Options include preset application rates and tips.

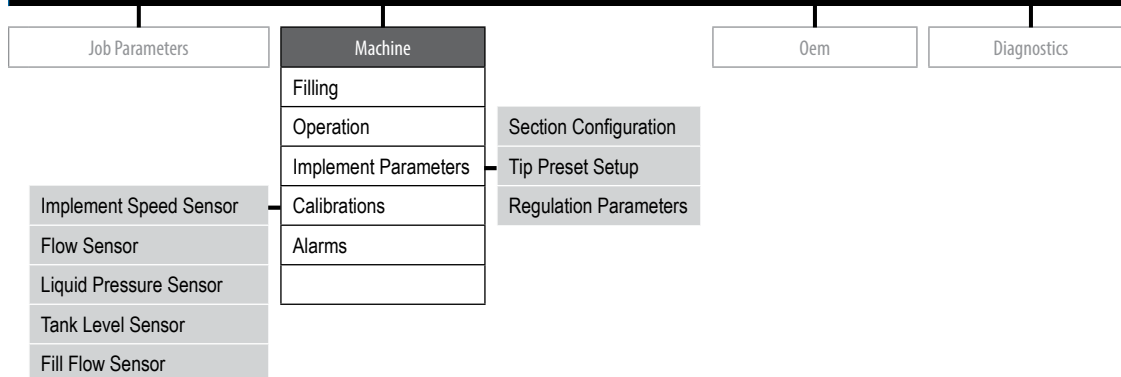
### MAIN SETUP MODE MENU STRUCTURE



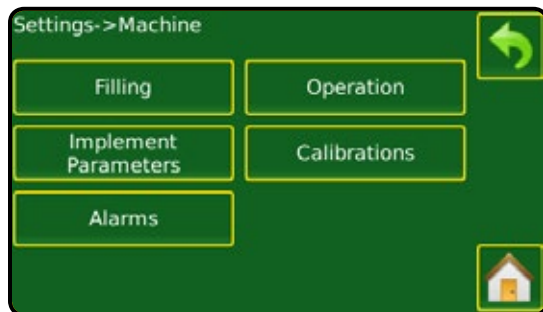
## MACHINES

Machine configures machine settings. Options include Filling, Operation, Implement parameters, Calibrations and Alarms.

### MAIN SETUP MODE MENU STRUCTURE



- ▶ Filling – establishes the amount of actual and desired material in the tank and the density of that material
- ▶ Operation – establishes application rate step, speed source, simulated speed and minimum speed
- ▶ Implement Parameters – establishes the section configuration, tip preset setup and regulation parameters
- ▶ Calibrations – establishes either manual or automatic settings of the sensors
- ▶ Alarms – establishes alarms on or off or sets their trigger level



# Radion 8140 Automatic Sprayer Control

## Filling

Settings->Machine->Filling (1)

Actual Content	425 gal
Density Type	Fertilizer
Density Factor	8.345

Settings->Machine->Filling (2)

Desired Content	450 gal
Actual Content	425 gal
Automatic Filling	<input type="checkbox"/>

## Section Configuration

...Implement Param.->Section Configuration

Section Number	3
Number of Tips	5
Copy Section 1	Copy
Section Width	98 in

## Regulation Parameters

...Implement Param.->Regulation Parameters

Coarse Valve Calibration	10
Fine Valve Calibration	3
Tip Spacing	19.7 in
Regulation Mode	Flow

## Operation

Settings->Machine->Operation

Application Rate Step	2 %
Speed Source	CAN Speed
Simulate Speed	15.0 mph
Minimum Speed	0.0 mph

## Tip Preset Setup

...Implement Param.->Tip Preset Setup (1)

Tip Preset	1
Tip Series	XRC110
Tip Capacity	15(Lt Green)
Factory Settings	Restore

...Implement Param.->Tip Preset Setup (2)

Low Pressure Limit	14.9 psi
High Pressure Limit	60.0 psi
Reference Flow	1.50 gal/min
Reference Pressure	40.0 psi

## Implement Parameters

- ▶ Section Configuration – sets the number of tips on the boom which determines the spraying width during application.
- ▶ Tip Preset Setup – where up to five (5) sets of tip options can be established to set the tip series, capacity, low/high pressure limit, reference flow and reference pressure.
- ▶ Regulation Parameters – where adjustments to the valve calibration, tip spacing and regulations mode can be established.

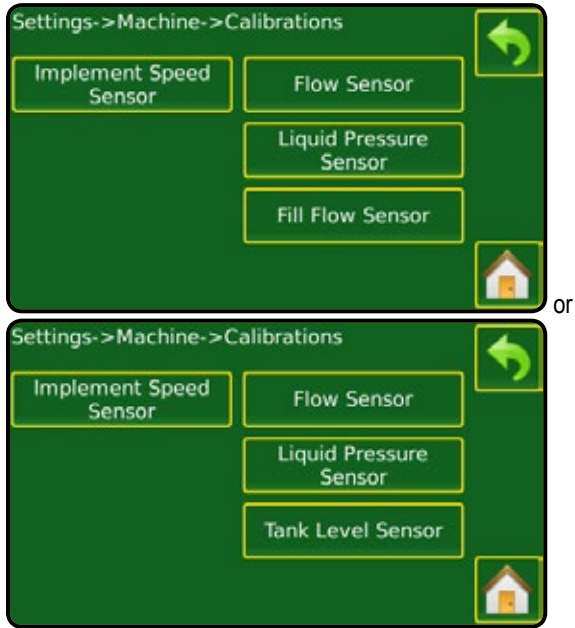
...Machine->Implement Parameters

Section Configuration	Tip Preset Setup
Regulation Parameters	

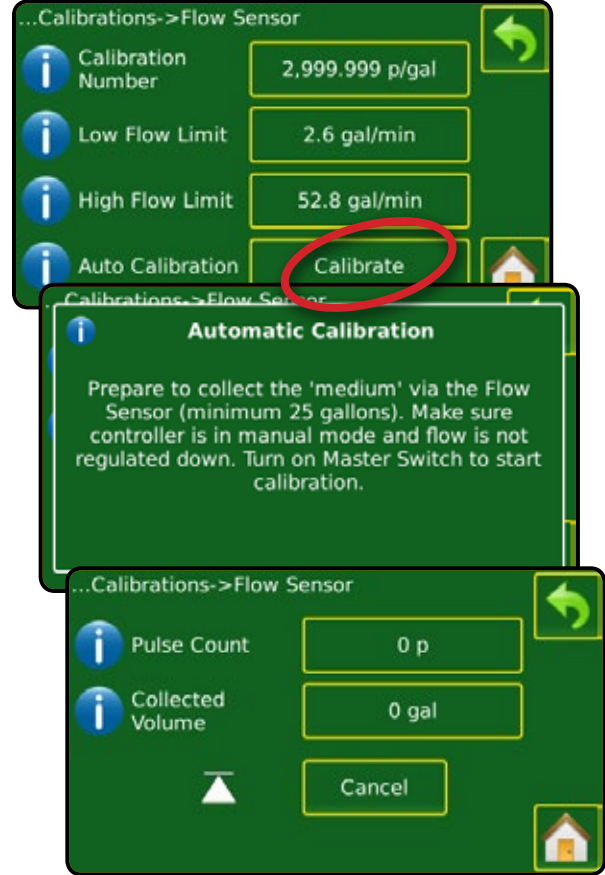
# Radion 8140 Automatic Sprayer Control

## Calibrations

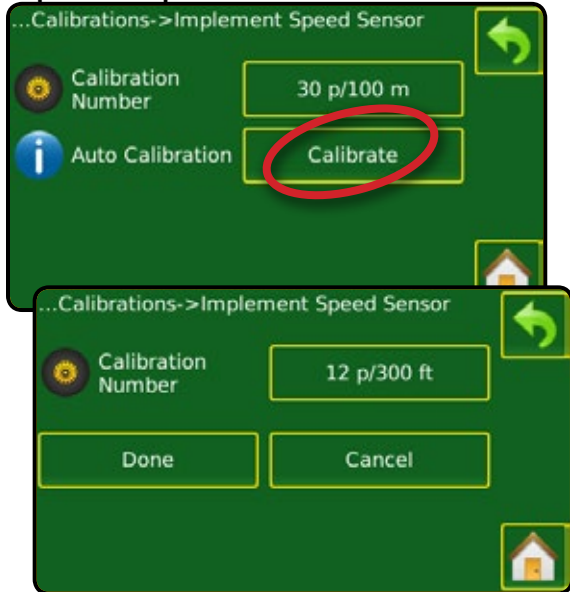
- ▶ Implement Speed Sensor
- ▶ Flow Sensor
- ▶ Liquid Pressure Sensor
- ▶ Tank Level Sensor
- ▶ Fill Flow Sensor



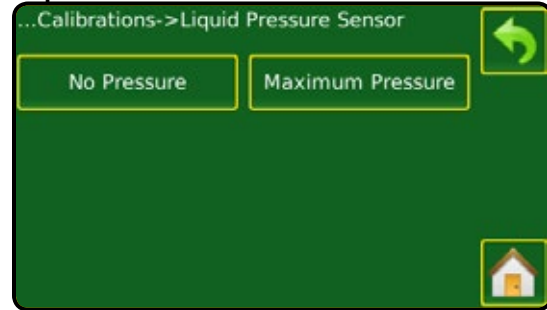
## Flow Sensor



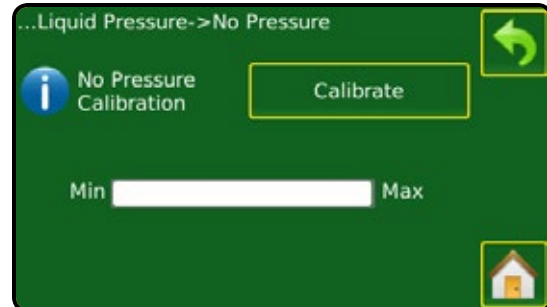
## Implement Speed Sensor



## Liquid Pressure Sensor



## No Pressure



# Radion 8140 Automatic Sprayer Control

## Maximum Pressure

...Liquid Pressure->Maximum Pressure (1)

Max Pressure 72.66 psi

Reference Pressure 72.5 psi

Auto Calibration Calibrate

Calibrate

Activate Master valve and increase/decrease pressure. Make sure all section valves are open before opening Master valve; otherwise, the pressure could build and damage the system.

Complete Calibration Done

Min Max

## Minimum Tank Level

...Tank Level Sensor->Minimum Tank Level

Min Tank Level 46 gal

Auto Calibration Calibrate

Low High

## Maximum Tank Level

...Tank Level Sensor->Max Tank Level

Max Tank Level 7,397 gal

Auto Calibration Calibrate

Low High

## Tank Shape

...Tank Level Sensor->Tank Shape

Max Tank Level 7,397 gal

Flip Master Switch to start calibration.

Tank Level Sensor

Low High

## Tank Level Sensor

...Calibrations->Tank Level Sensor

Empty Tank Minimum Tank Level

Max Tank Level Tank Shape

## Empty Tank

...Tank Level Sensor->Empty Tank

Auto Calibration Calibrate

Low High

Calibration Process Overview

Before starting the calibration process, fill the tank to its maximum level with water. When ready, activate the Master Switch to open the master valve and start Tank Shape calibration. Spray the tank empty with a constant flow rate.

...Tank Level Sensor->Tank Shape

Tank Level Sensor

Low High

Calibration Progress

0% 100%

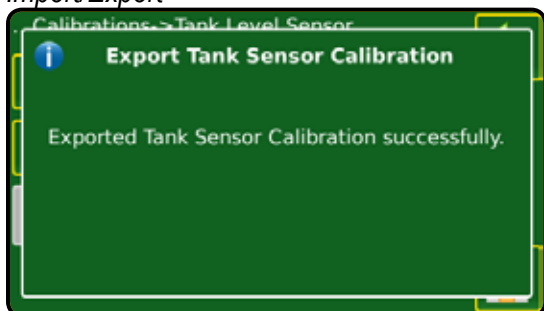
Calibration Complete

The calibration process is now complete. Turn Master Switch off.



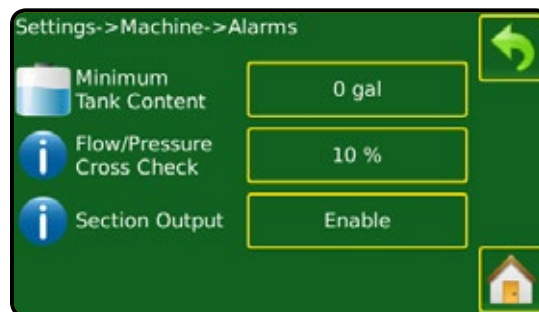
# Radion 8140 Automatic Sprayer Control

## Import/Export

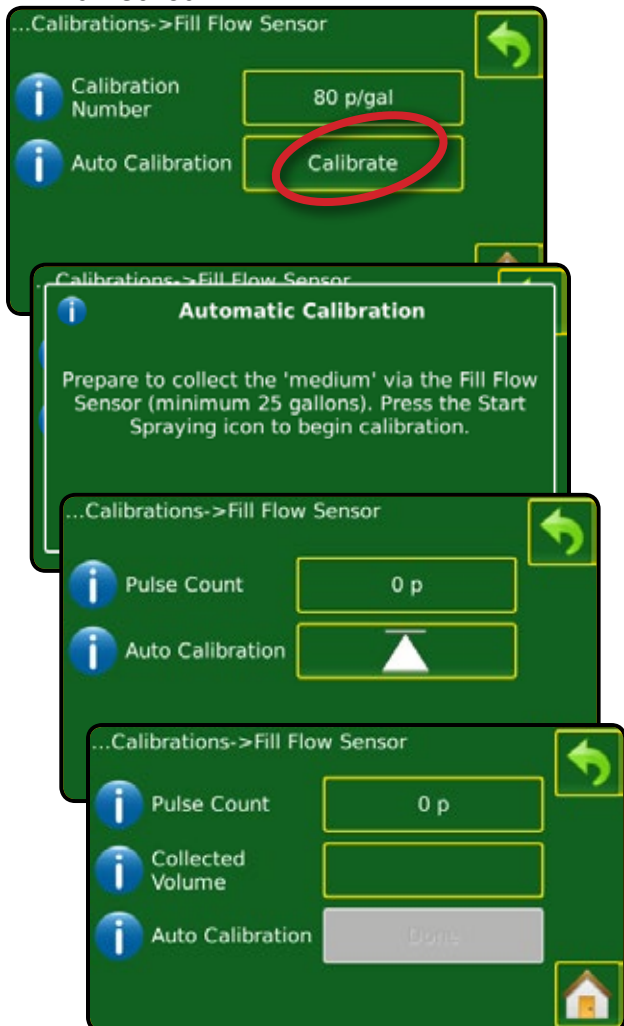


## Alarms

Alarms establishes alarms on or off or sets their trigger level.



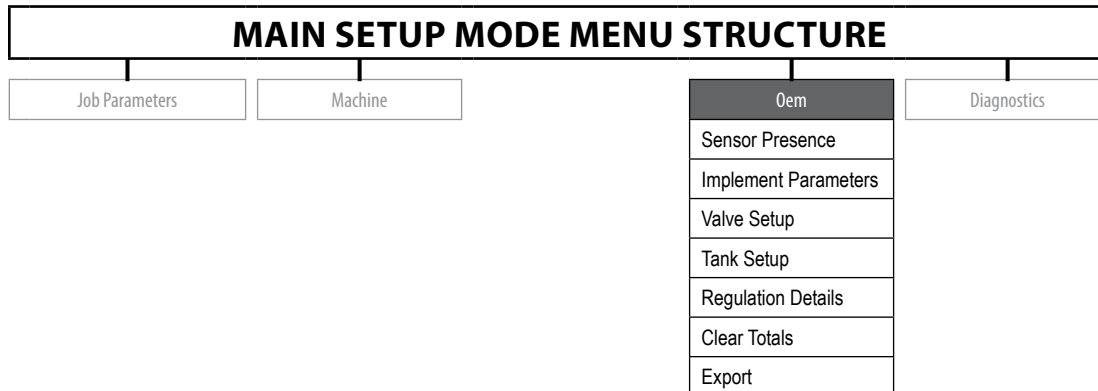
## Fill Flow Sensor



# Radion 8140 Automatic Sprayer Control

## OEM

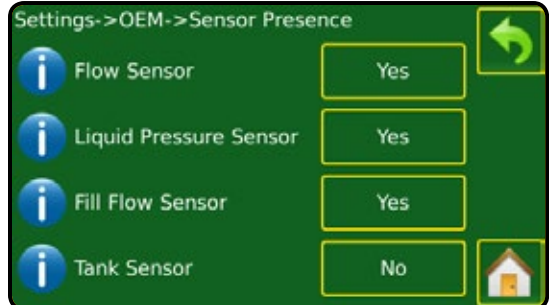
The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. To obtain an access code, contact your local dealer or TeeJet Technologies Customer Service.



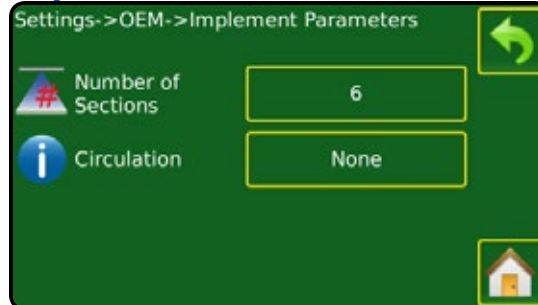
- ▶ Sensor Presence – used to establish sensors for Flow, Liquid Pressure, Fill Flow and the Tank
- ▶ Implement Parameters – used to establish the number of sections and circulation
- ▶ Valve Setup – used to establish the regulation valve type, section valve behavior and section valve type
- ▶ Tank Setup – used to establish maximum and minimum tank content, auto filling mode and auto filling offset value
- ▶ Regulation Details – used to adjust the control of the regulation valve
- ▶ Clear Total – used to delete the total count system counter for area, volume and time back to the default settings
- ▶ Import/Export – used to import or export settings



### Sensor Presence



### Implement Parameters



# Radion 8140 Automatic Sprayer Control

## Valve Setup

Settings->OEM->Valve Setup

Regulation Valve Type	Throttle
Section Valve Type	2-way
Section Valve Behavior	Follow Master

## Clear Totals

Settings->OEM->Clear Totals

Area Counter	273.60 ac
Volume Counter	2837 gal
Time Counter	0h 34m
Clear All Total Counters	Clear

## Tank Setup

Settings->OEM->Tank Setup

Maximum Tank Content	7,397 gal
Minimum Tank Content	46 gal
Automatic Filling	On
Automatic Filling Offset	0 gal

## Import/Export

Settings->OEM

Sensor Presence	Implement Parameters
Valve Setup	Tank Setup
Regulation Details	Clear Totals
← [Icon]	[Icon] →

## Regulation Details

Settings->OEM->Regulation Details (1)

Minimum Regulation Pressure	8.7 psi
Maximum Regulation Pressure	362.6 psi
Regulation Valve Time	6.0 sec
Minimum Regulation Voltage	0.8 V

Settings->OEM->Regulation Details (2)

Regulation Deadband	2.0 %
Regulation Valve Capacity	32 gal/min
Regulation Start Delay	0.3 sec
Manual Regulation Speed	100.0 %

Settings->OEM

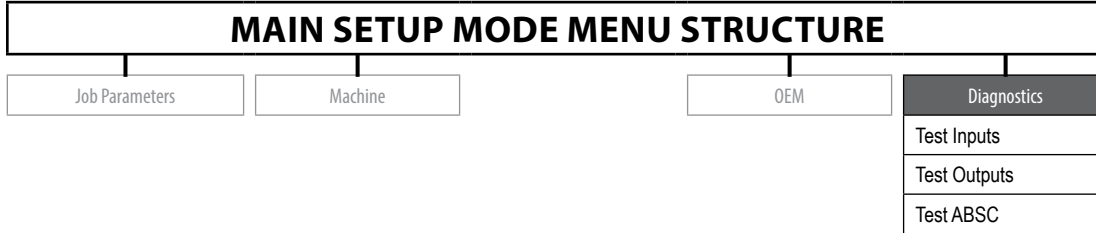
Sensor Presence	Implement Parameters
Valve Setup	Tank Setup
Regulation Details	Clear Totals
← [Icon]	[Icon] →

# Radion 8140 Automatic Sprayer Control

## DIAGNOSTICS

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 Master Valve, Fill Valve and Section Valves are on or off.
- ▶ Test ABSC – displays automatic boom section control correction, mode and section input status. (Only available when feature is unlocked.)



### Test Inputs

### Test Outputs

### Test ABSC



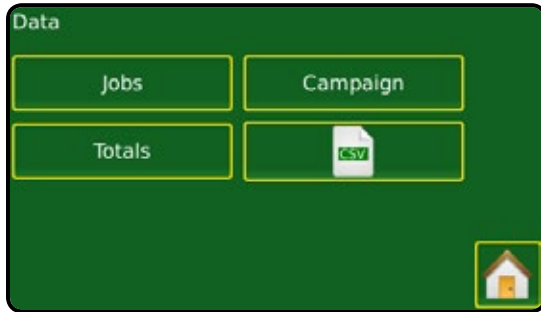
# Radion 8140 Automatic Sprayer Control

## DATA

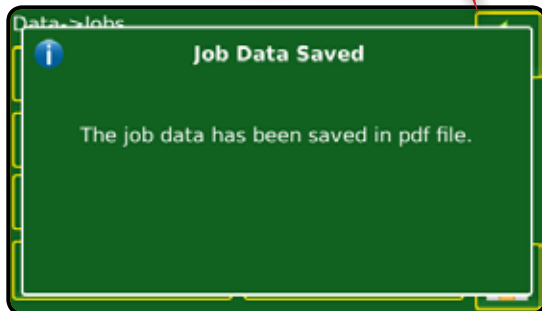
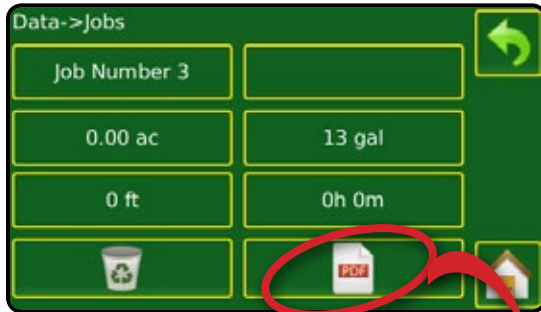


The Data screen gives access to job information, campaign information, total accumulated information and exporting a report.

- ▶ Jobs – 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
- ▶ Totals – used to display information regarding area, amount applied, and time for all activity
- ▶ Report– allows counter information to be exported in CSV format



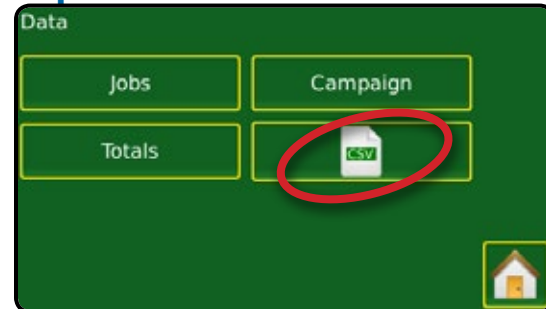
### Jobs



### Totals



### Report



### Campaign



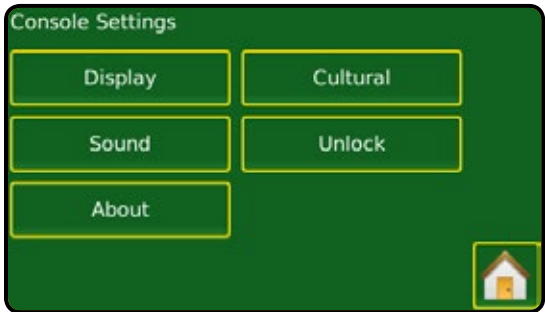
# Radion 8140 Automatic Sprayer Control

## CONSOLE SETTINGS

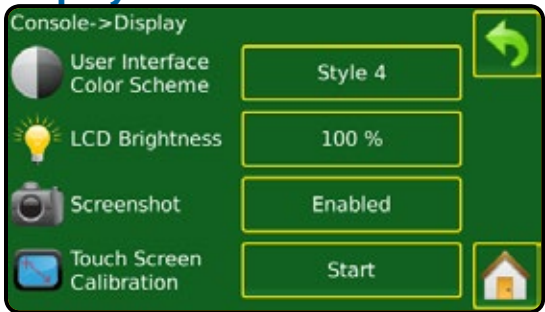


Console setup is used to configure the display and cultural settings. Information about the console can be found in the About section.

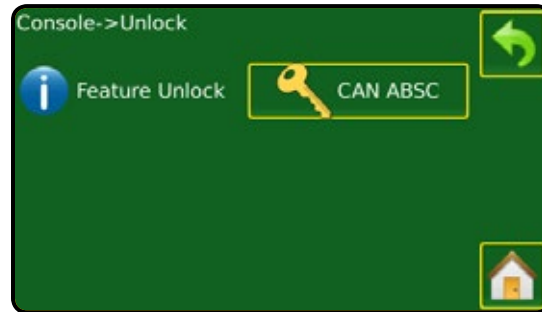
- ▶ Display – used to configure color scheme and LCD brightness, establish screenshot availability and calibrate the touchscreen
- ▶ Cultural – used to configure units, language, date and time settings
- ▶ Sound – used to enable or disable the key beeps
- ▶ Unlock Features – used to unlock CAN ABSC.
- ▶ About – used to display the system software version



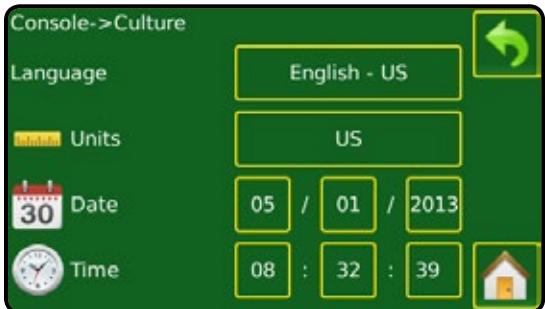
### Display



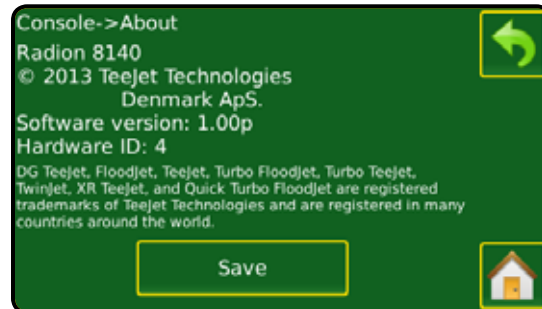
### Unlock Features



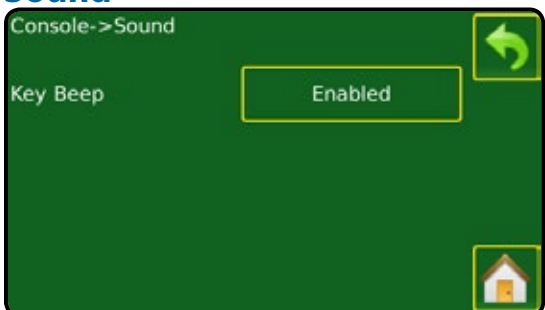
### Culture



### About



### Sound

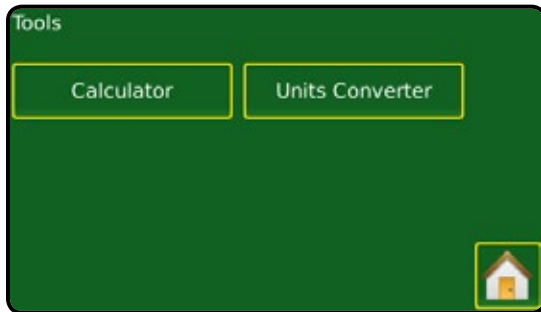


## TOOLS

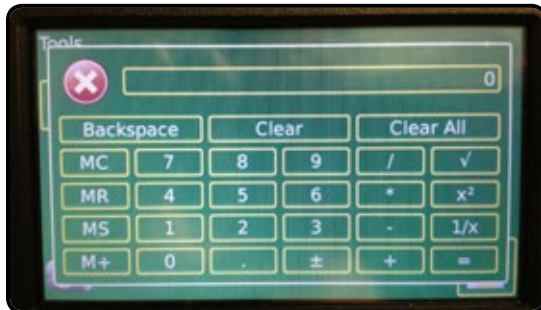


The Tool menu allows the operator to do various calculations on a regular calculator or on a unit converter. The unit converter calculates various measurements based on area, length or volume.

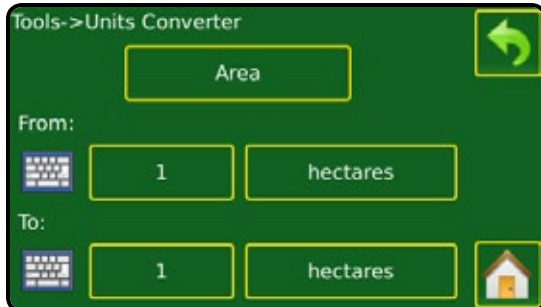
- ▶ Calculator – used to perform mathematical calculations
- ▶ Units Converter– used to perform unit conversions for area, length and volume



## Calculator



## Units Converter



# RADION AUTOMATIC SPRAYER CONTROL

SIMPLIFIED REFERENCE GUIDE



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Springfield, Illinois 62703 USA  
[www.teejet.com](http://www.teejet.com)

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