CHAPTER

10

The Field-IQ Plugin

In this chapter:

This chapter describes how to calibrate, configure, and operate the Field-IQ™ crop input control system with the FmX integrated display.

Introduction

When the Field-IQ plugin is installed, the FmX integrated display can control planters, sprayers, air seeders, liquid strip-till tool-bars, and spinner spreaders. It can perform automatic section control using Tru Count air clutches, boom valves, LiquiBlock, and various section control devices while also controlling rates using a prescription with Rawson drives, servo valves, PWM valves, and various flow control devices. This chapter explains how to configure and use the Field-IQ plugin.

Different functions of the plugin can be configured and controlled by Field-IQ as follows:

Application	Main functions
Planter	• Seed Section Control of up to 48 individual rows (Field-IQ section control module(s) needed) using Tru Count air clutches. • Seed Rate Control using up to 4 Rawson drives to change seed population (Field-IQ Rawson Control Module(s) needed). • Liquid Fertilizer Control of up to 48 individual liquid nozzles (Field-IQ section control module(s) needed) using Tru Count LiquiBlock valves. • Variety tracking.
Sprayer	• Liquid Rate Control, using either a PWM or Servo control valve. • Liquid Section Control of up to 48 individual spray nozzles (Field-IQ Section Control Module(s) needed) using existing boom shutoff valves or Tru Count LiquiBlock valves.
Strip-till (liquid)	• Liquid Section Control of up to 48 sections or individual sections (Field-IQ Section Control Module(s) needed) using Tru Count LiquiBlock valves. • Liquid Rate Control using up to 2 Rawson drives connected to ***fixed displacement pumps,*** such as CDS-John Blue piston pumps, to change liquid rate (Field-IQ Rawson Control Module(s) needed). • Liquid Rate Control using either a PWM or Servo control valve and flow meter.
Spreading	• Spreading Rate Control using a Rawson Drive (Field-IQ Rawson Control Module(s) needed). • Spreading Rate Control using either a PWM or Servo control valve and application rate sensor.
Air seeder	• Section Control of up to 96 rows of blockage sensors. • Section Control of up to 6 materials simultaneously with manual rate or prescription. • Control existing PWM, linear actuators, or servo systems. • Auxiliary sensors can read fan speed, bin level, air pressure, and implement switches.

Definitions

Term	Definition
Material	A product that is controlled by a PWM valve, Servo valve, or Rawson drive. You can use a planter (seed), liquid, granular seed and granular fertilizer, all of which have different set-up parameters.
Section	A number of rows or spray nozzles that are controlled by existing shut-off valve, Tru Count air clutches, or Tru Count LiquiBlock valves. A section can have either a single row/nozzle or multiple rows/nozzles depending on how the system is set up.
Row	The individual row unit which seed comes from on the planter. This can be controlled individually as a single row section, or as a group with other rows in a multiple row section.

Units of measure

Type	Unit	Symbol	Description
Seed	Metric US/Imperial	kS/ha kS/a	Thousands of seeds per hectare Thousands of seeds per acre
Granular seed	Metric US/Imperial	kg/ha lbs/a	Kilograms of seed per hectare Pounds of seed per acre
Liquid application	Metric US/Imperial	L/ha Gal/a	Liters per hectare Gallons per acre
Granular fertilizer	Metric US/Imperial	kg/ha lbs/a	Kilograms of fertilizer per hectare Pounds of fertilizer per acre

Installing the Field-IQ hardware

For information on installing the Field-IQ crop input control system on your implement, refer to:

- *Field-IQ Platform Installation Instructions*
- *Tru Count Air Clutch Installation Instructions*
- *Rawson Installation Instructions*

For the latest versions of these documents, go to www.trimble.com/agriculture.

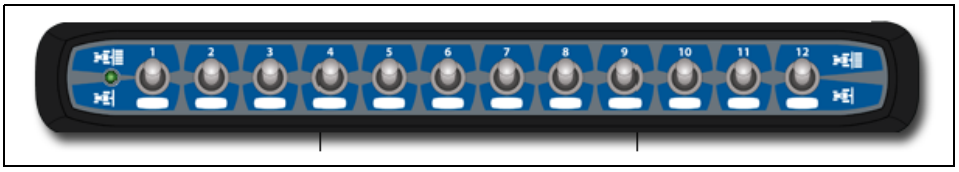
Note – *When using Rawson drives and when using more than one material, you must have a separate Section Control Module (SCM) for materials using Rawson drives.*

Field-IQ master switch box functions

	Feature	Function
❶	Increment/decrement switch	Increases the applied amount by a set amount (the amount is set in the *Setup* screen, *Rate* tab).
❷	Rate switch	Choose to use preset Rate 1, preset Rate 2, or Manual rate.
❸	LED indicator	Red: Unit is powered but not communicating with the FmX integrated display. Green: Unit is powered and communicating with the FmX integrated display. Yellow: Unit is initializing communications with the FmX integrated display.
❹	Automatic/Manual section switch	Automatic mode: The FmX integrated display automatically opens and closes sections when entering areas of overlap, non-apply zones, or crossing boundaries. Manual mode: The sections are controlled by the user using the Field-IQ system. **Tip –** You can switch from Automatic to Manual mode while traveling.
❺	Master switch	• 5a: Jump start position. The same functions as in Master On are active, plus the system is overridden to use a preset control speed (the speed is set in the *Setup* screen, *Override* tab). • 5b: On position. The sections and rate are ready to be commanded by the FmX integrated display. • 5c: Off position. Sections are closed and rate is set to zero. ***Note –*** *When you use Lock in Last Postion (see page 272), the valve is locked and the rate is controlled by an auxiliary master valve or section.* **Tip –** Use the jump start function if you lose a GPS signal or you want to start applying before your implement is up to speed.

Note – *All systems must have a Field-IQ master switch box.*

Field-IQ 12-section switch box (optional)



Only one section switch box can be used on each system. Each section switch is automatically assigned to the corresponding section. The sections are read from left to right. For example, switch 1 assigns to the section furthest on the left when standing behind the implement. For more information, see the Hardware tab in *Setup* screen of the Field-IQ plugin.

The section switches have different functions, depending upon the status of the master Automatic/Manual section control switch on the master switch box.

When the Automatic/Manual section control switch is in the ***Automatic*** position:

- If the section switch is in the on/up position the section(s) assigned to it are commanded automatically by the FmX integrated display.
- If the section switch is in the off/down position the section(s) assigned to it are commanded to be off.

When the Automatic/Manual section control switch is in the ***Manual*** position:

- If the section switch is in the on/up position, the section(s) assigned to it are commanded to be on. This overrides the FmX integrated display and coverage logging is ignored.
- If the section switch is in the off/down position, the section(s) assigned to it are commanded to be off. This overrides the FmX integrated display and coverage logging is ignored.

The LED has the following status indicators:

- Green – The unit is powered and is communicating with the FmX integrated display.
- Yellow – The unit is initializing communications with the FmX integrated display.
- Red – The unit is powered but not communicating with the FmX integrated display.

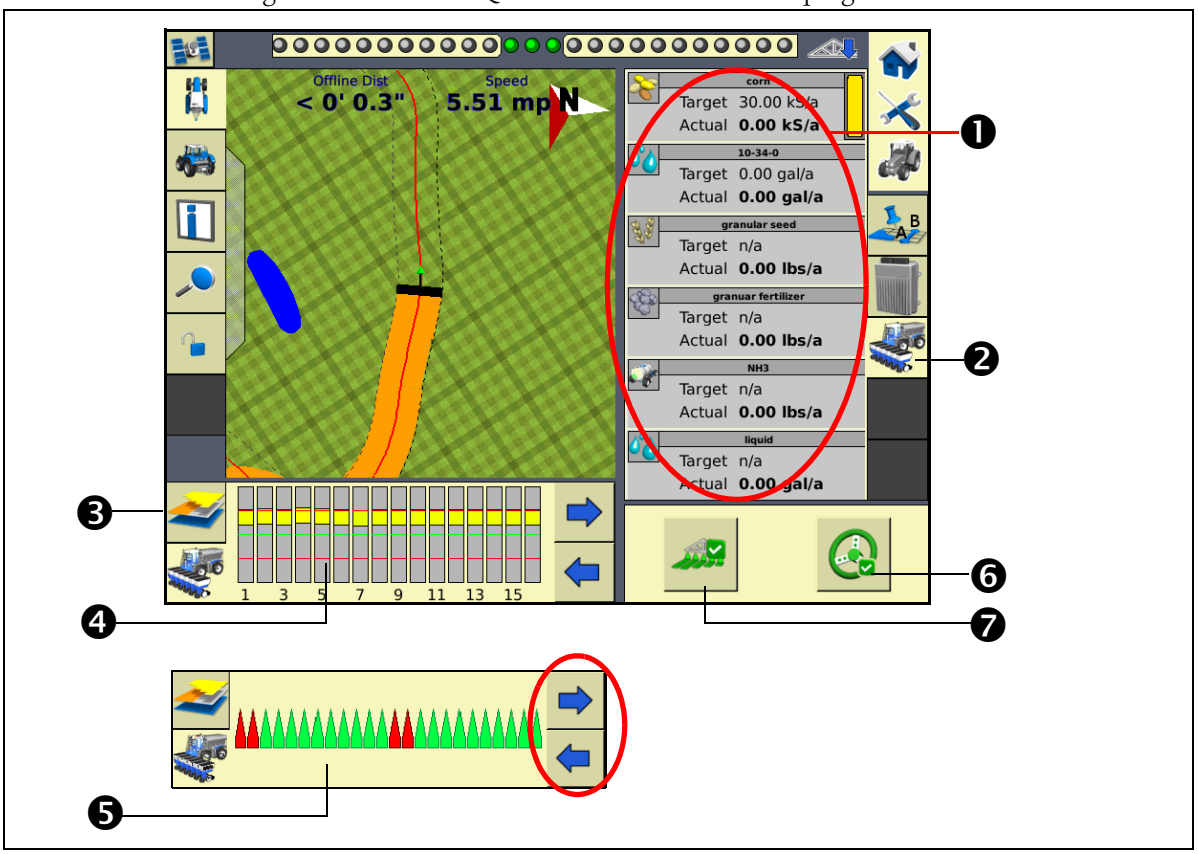
Field-IQ Run screen

The Field-IQ Run screen has three pages:

- Page 1—shows current information about an event and allows you to manipulate the materials and sections.
- Page 2—shows additional information on the current event.
- Page 3—shows row details.

Click the arrow key to move between the pages.

The following shows the Field-IQ run screen with the main plugin screen:

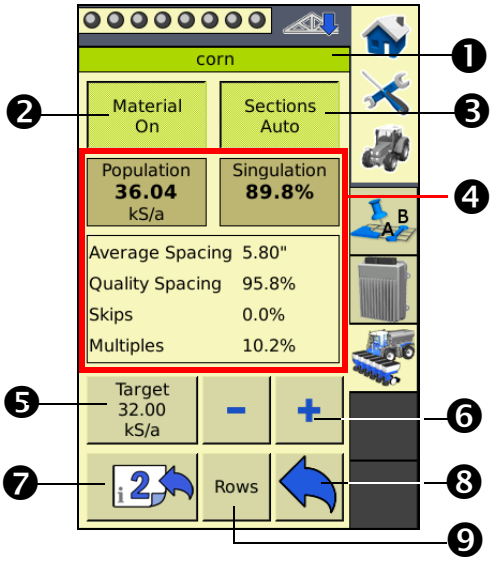


	Feature	Description
❶	Materials list	Up to 6 materials are listed. The current *Target* and *Actual* rates are shown for each material. Tap a material to show details of that material (see following page).
❷	Field-IQ Plugin icon	
❸	Mapping Information tab	Change the mapping information that appears on your screen. See Mapping information tab, page 48.
❹	Row Status Indicator tab	There are various shades of green, yellow, and red. These shades reflect how far off target the rows are applying. Green: Rows are applying on target. Red: Rows are applying off target. Black: Rows have been manually turned off. White: Rows have been turned off automatically by the system.
❺	Field-IQ Status tab	Shows the engage status of each row on the implement: Green: Engaged. Gray: Section closed due to overlap. Red: Not engaged or section manually turned off. Tap the blue arrows to toggle between the Row Status Indicator tab ❹ and the Field-IQ Status tab.
❻	Engage button	Green: Auto guidance engaged. Gray: Auto guidance can be engaged. Red: Auto guidance cannot be engaged.

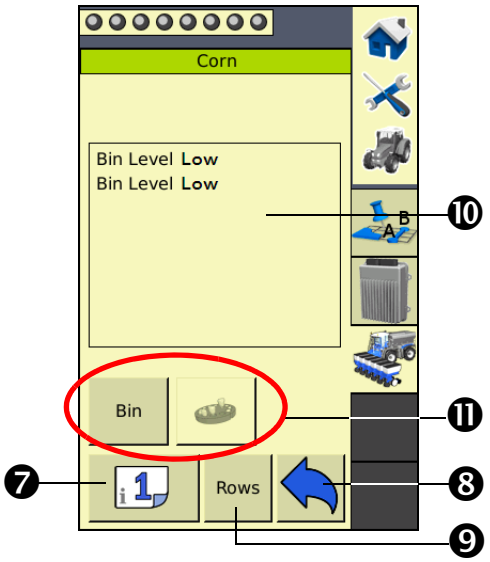
	Feature	Description
❼	Logging button	Green: Logging enabled. Red: Logging.

Tap a material (in this example, Corn) to view more details:

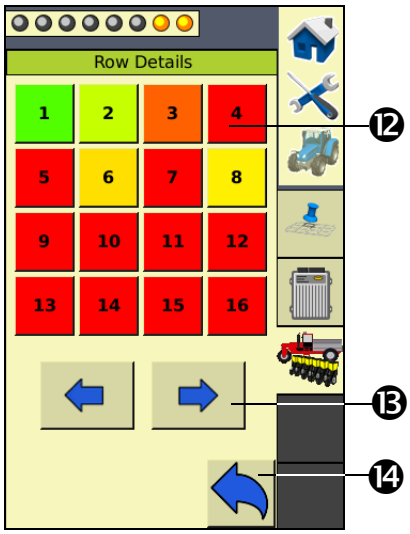
Page 1 of the plugin tab



Page 2 of the plugin tab



Row Details tab



Please check the placement of the callouts in page 2. Wild guess on my part.

	Description
❶	The name of the material you are viewing.
❷	Tap to turn the material on or off.
❸	Tap to turn auto-section control on or off.
❹	Current information about the event.

	Description
❺	Target rate. Tap the button to select if Target 1 or Target 2 is shown, or to select Manual to turn the Targt rate off.
❻	Tap the **-** button to decrease the Target rate by 1; tap the **+** button to increase the Target rate by 1.
❼	Tap to go to page 1 or to page 2 of the plugin tab.
❽	Tap to return to the main plugin tab.
❾	Tap to go to the *Row Details* tab.
❿	Current sensor status.
⓫	Depending on the material, the following buttons appear: **Bin**: Tap to go to the *Virtual Bin / Tank Setup* screen where you can adjust the bin setting. Seed Disc: Tap to fill the seed disk. Arm Pump: Tap to enable Field-IQ to control the pump. Gate Setup: Tap to go to the *Gate Setup* screen. Density: Tap to go to the *Density* screen where you can enter the density of the current product.
⓬	There ar various shades of green, yellow, and red. These shades reflect how far off target the rows ar applying. Green: Rows are applying on target. Red: Rows are applying off target. Black: Rows have been manually turned off. White: Rows have been turned off automatically by the system.
⓭	Tap the arrows to view more row numbers.
⓮	Tap to return to the previous plugin screen.

Linking Materials

The Field-IQ system can link primary and secondary materials, where the secondary material uses the output of the primary material. For example, LiquiBlock valves can be linked to use the output of Tru Count Air Clutch systems.

When planting, seeding, or strip-tilling, you can link the following together:

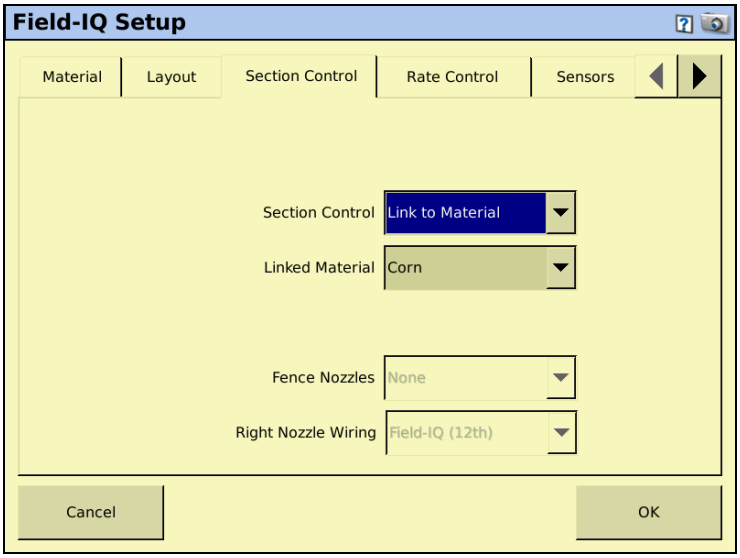
- Liquid
- Granular seed
- Granular fertilizer

Anhydrous cannot be linked.

When the system is in diagnostics mode, the secondary material is not functional.

When the system is in diagnostics mode, you can only operate a linked material when you also open the sections of the primary material.

1. In the *Section Control* tab, in the *Section Control* field select *Link to Material*:



2. In the *Linked Material* field, select the primary material that you want to link to.
3. Select the *Rate Control* tab and then set that up as usual.

For more information, see the sections below.

General setup information

Do the following prior to setting up the Field-IQ system for planting, spraying, and so on.

Before starting the Field-IQ plugin setup on the FmX integrated display, ensure that:

- all components of the system are installed on the vehicle and implement.
- the Field-IQ plugin has been added to the FmX integrated display configuration. See Adding or removing a plugin, page 172.
- the implement has been set up and configured for the appropriate operation, such as planting or spraying. See Chapter 7, Implement Configuration.

The Field-IQ Setup Wizard

The FmX integrated display contains a *Field-IQ Setup Wizard* that steps you through setting up the Field-IQ system. You must enter accurate values on each screen of the wizard to ensure that the system operates correctly.

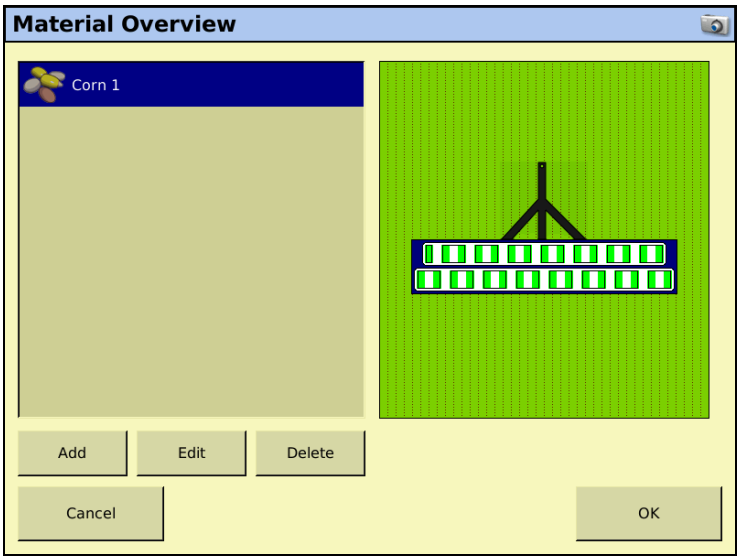
To navigate the wizard:

- Tap **Next** to proceed to the next screen.
- Tap **Back** to return to the previous screen.
- To enter a number or a name, tap in the blank field to open the virtual keypad or keyboard.

Note – *When you have completed the setup wizard once, the* ***Next*** *button is replaced with* ***OK****. You can then view each tab by tapping it on the screen.*

To access the Field-IQ setup wizard:

1. In the *Configuration* screen, select the Field-IQ plugin and then tap **Setup**. The *Material Overview* screen appears:



The *Material Overview* screen displays the materials that are currently set up to be applied with the Field-IQ system.

2. Do the following:

Tap...	To...
Add	add and set up a new material
Edit	view or edit the details of an existing material
Delete	delete an existing material

3. When you tap **Add** or **Edit**, the *Field-IQ Setup Wizard* appears. The wizard contains seven tabs. The information that appears on each tab depends on the operation you are setting up. Enter accurate information into each field of the wizard.

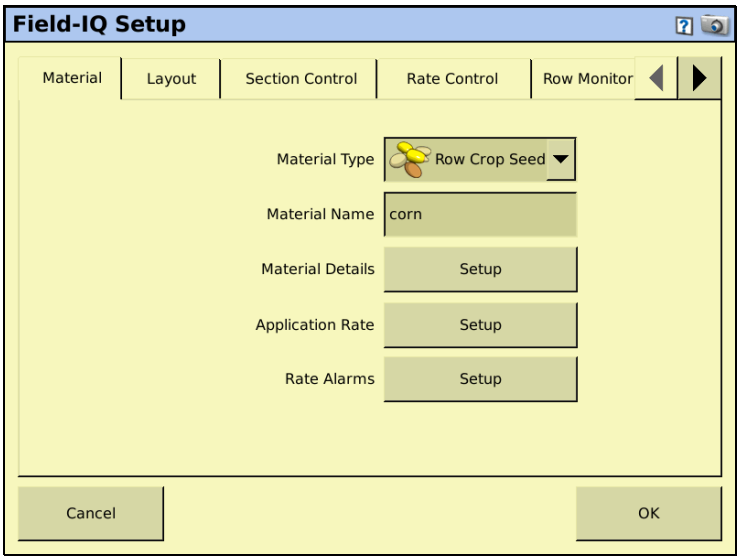
Setting up the Field-IQ system for Planting

Make sure that you have set your implement to Planter, and that you have configured the implement, see Configuring the display, page 75. In the *Material Overview* screen, tap **New** to open the Field-IQ Setup Wizard. The Wizard contains the following seven tabs:

For information on this tab...	See...
Material	page 233
Layout	page 234
Section Control	page 236
Rate Control	page 238
Row Monitoring	page 241
Sensors	page 242
Operation	page 243

Material tab

Enter information about the material you want to set up.

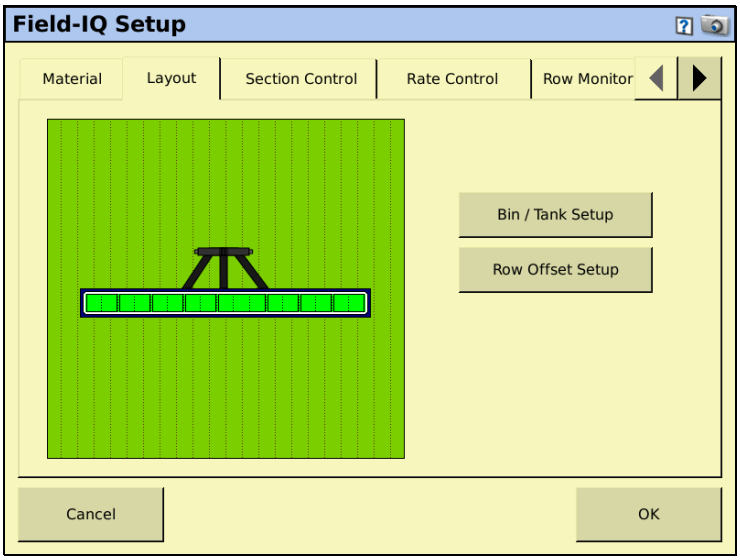


Setting	Description
Material Type	Select your Field-IQ application type: ***Note –*** *If spraying chemicals, use the liquid fertilizer setting.* • Row Crop Seed • Liquid • Granular Seed • Granular Fertilizer • Anhydrous
Material Name	Use the virtual keyboard to enter a name for the material.
Material Details	Tap **Setup** to open the *Hybrid Setup* screen. See Logging varieties, page 65.

Setting	Description
Application Rate	***Rates tab*** Adjust the following Rate settings: • Target Rate: This setting controls the volume that the implement supplies when the Rate switch is in position 1. • Target Rate 2: This setting controls the volume that the implement supplies when the Rate switch is in position 2. • Rate Increment: When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Manual Rate Increment: When the Rate switch is in the Manual position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Minimum Rate: This setting is the minimum rate that will be applied. • Maximum Rate: This setting is the maximum rate that will be applied
	Units tab Adjust the following Unit settings: • Seeds Per Pound: Enter the number of seeds per pound of the current material. • Target Rate Units: Choose what units your target rate will apply. • Bushel Weight: Enter the bushel weight of the current material.
Rate Alarms	Tap **Setup** to set alarm thresholds and adjust the way seed statistics are calculated: • High Alarm: Triggers when the rate reaches the selected percentage above the target for longer than the delay setting. • Low Alarm: Triggers when the rate drops the below the target for longer than the delay setting for the selected percentage. • Singulation Low: Triggers when singulation reaches a percentage lower than 100% for longer than the delay setting. • Seeds When Off: Triggers when this percentage of seeds is detected while the sections are off for longer than the delay setting. • No Seeds When On: Triggers when this percentage of seeds is not detected for longer than the delay setting. • Blockage Sensitivity/Alarm: When less than this amount of material is sensed for the number of seconds given. • When no pulses are sensed for this amount of time the alarm triggers. • Multiples Threshold: If two seeds fall within this percentage of seed spacing it is considered a double. Lowering this number requires seeds to be closer together to be reported as a double. • Skips Threshold: If two seeds fall outside of this percentage of seed spacing it is considered a skip. Raising this number requires seeds to be further apart to be a skip. • Averaging Sample Size: This is the number of seeds used to calculate the average. Increasing this amount makes the response slower but more stable. • Misplaced Seeds Threshold: If a seed falls outside this percentage of seed spacing then it's considered misplaced and reduces the spacing quality.

Layout tab

Enter information about the implement that will be used to apply the material.

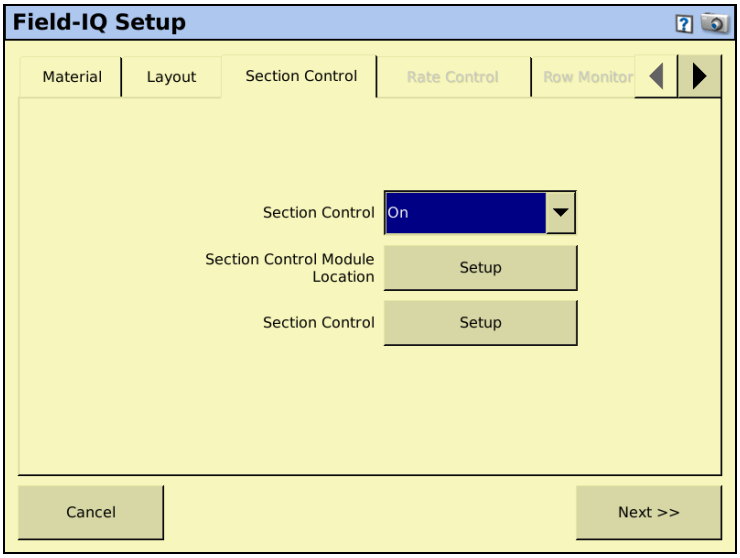


Setting	Description
Bin/Tank Setup	Allows the system to track how much material is left in the bin/tank, and provides a warning when the bin/tank needs to be refilled. Adjust the settings for: • Status: On: The system will track the bin/tank level and provide warnings. Off: The system will not track the bin/tank level or provide warnings. • Capacity Units: Select Default Units or Bushels. Default units will vary according to the type of material that is being applied. • Bin Capacity: The amount the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* • Current Volume: Current volume of the product in the tank. • Partial Refill: The amount of material that will be added to the bin/tank during a partial refill. • Warning Level: A warning will appear on your screen when your bin/tank reaches a set threshold. • Refill Tank/Bin: Refills the tank/bin to capacity. • Partial Refill Tank/Bin: Refills the tank/bin to the amount specified in the *Partial Refill* field.

Setting	Description
Row Offset Setup	Row Offset Setup provides additional tuning by detailing where the material will be applied in relation to the vehicle. Increase coverage accuracy by selecting one or two offsets. Row offsets are measured from the Application Offset that is entered in the Measurements tab of the Implement Configuration wizard. See Implement Configuration, Measurements, page 165. • Number of row offsets: Use 1 row offset when coverage is applied at a single location. Use two row offsets when planting singulated seed with staggered implements. • Row Offset (1 row offset): Enter the distance between the Application Offset and the row. • Rear Row Offset (2 row offset): Enter the distance between the Application Offset and the rear row. • Front Row Offset (2 row offset): Enter the distance between the Application Offset and the front row.

Section Control tab

Adjust the section control settings.

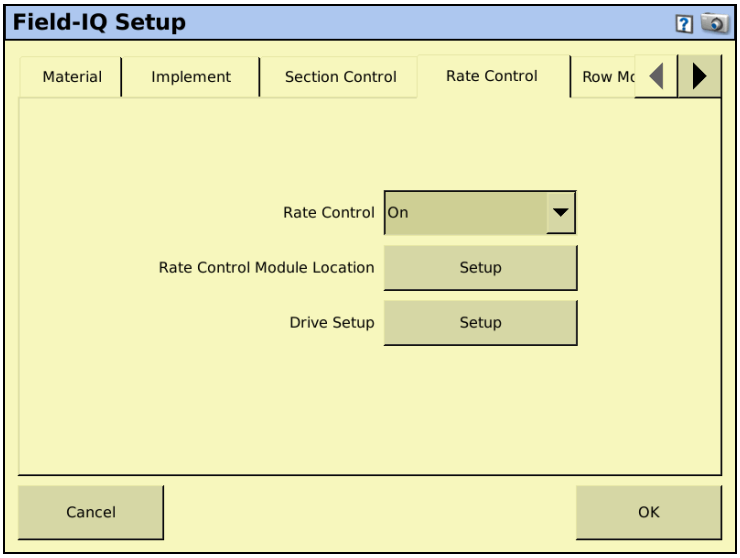


Setting	Description
Section Control	On: Enable section control for the current material. Off: Disable section control for the current material. Rate as Section: When a rate controller turns on or off, the section turns on or off. Link to Material: See Linking Materials, page 230.

Setting	Description
Section Control Module Setup	Tap **Setup** to configure the section control module(s), their location on the implement, and the number of sections they will control. Assign the Field-IQ module to the correct location to ensure it controls the correct section. • Number of Modules: Enter the number of Field-IQ section control modules you will use. • Module: Select the module number that corresponds to each section. • Number of Sections: Assign the number of sections that each module will control. • Section Grouping: Assign the rows that are in each section. • Advanced Wire Assignment: Every section is controlled by a specific wire on each Field-IQ module. Use this setting to specify which module each section is wired to.
Section Control	Tap **Setup** to adjust settings for each section control module. • Section Control Type: Select the type of section control for each module. • Off When Stopped: When set to Yes the control valve will close when ground speed reaches 0 with the master switch position in On. When set to No the control valve will hold its last position when the master switch is shut off and ground speed reaches 0—if the vehicle is a clutch-operated planter, set this option to *No* so that you can continue planting when the vehicle is stopped. Otherwise, select *Yes*. • On Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the On Latency value to compensate the delay, and the system will turn on in advance. • Off Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the Off Latency value to compensate for the delay, and the sytem will turn off after the set number of seconds. • Start Overlap: Enter the distance of intentional swath overlap when entering a previously applied area. The higher the number, the greater the overlapped area. • End Overlap: Enter the distance of intentional swath overlap when exiting a previously applied area. The higher the number, the greater the overlapped area. • Coverage Switching Overlap: Enter the percentage of the section width for intentional swath overlap. The higher the number, the greater the overlapped area before the section is turned off. • Boundary Switching Overlap: Enter the percentage of the section width for intentional overlap of a boundary. The higher the number, the greater the overlapped area into the boundary area.

Rate Control tab

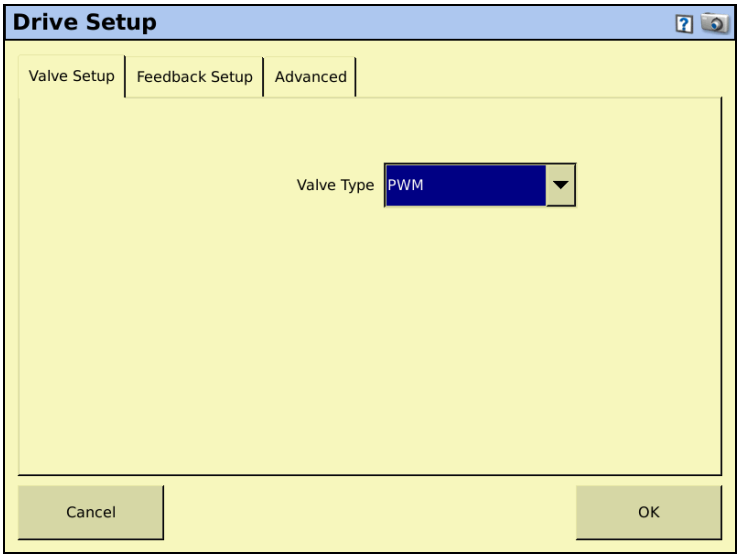
Adjust the rate control settings.



Setting	Description
Rate Control	On: The system sets the target rate. Off: Section switching only
Rate Control Module Location	Tap **Setup** to configure the rate control module(s), their location on the implement, and the width they will control.
Drive Setup	When you tap **Drive Setup**, a screen appears with the following tabs: • Valve Setup • Feedback Setup • Advanced The tabs are explained in more detail on the following pages.

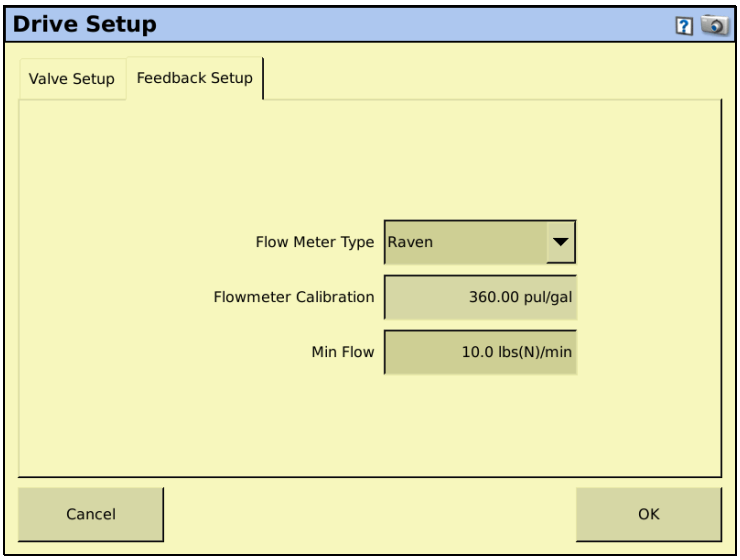
Drive Setup

Valve Setup tab



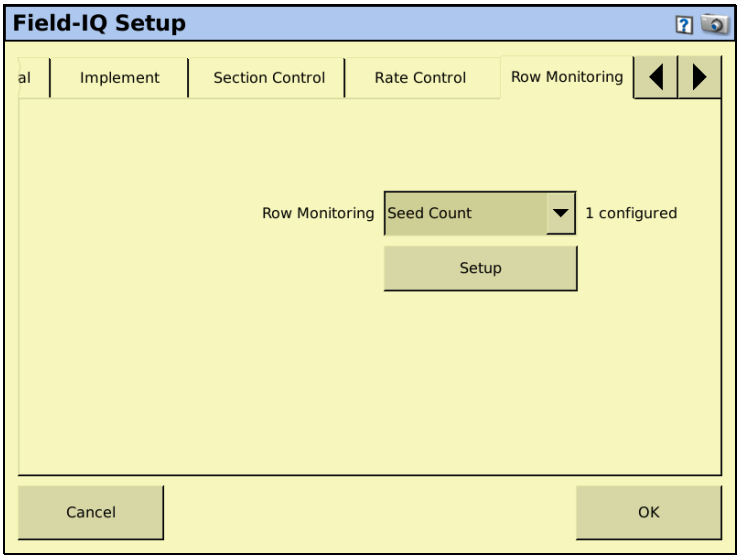
Setting	Description
Valve Type	Servo: 2-wire standard servo valve Fast Servo: 4-wire servo valve PWM: 2-wire PWM valve (commonly used to control hydraulic flow to the pump) Hardi % Bypass: Used on Hardi sprayers equipped with 3-way section valves that return flow to the tank when the boom section is off. Pump Servo: commonly used for anhydrous application. Linear Actuator: A valve that creates a linear motion (as opposed to a rotary motion). Electric over Hydraulic: A valve that uses electric current to power the solenoid.

Feedback Setup tab



Setting	Description
Flow Meter Type	Select the type of flow meter that is connected.
Flowmeter Calibration	Enter the number from the flow meter tag.
Min Flow	Enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.

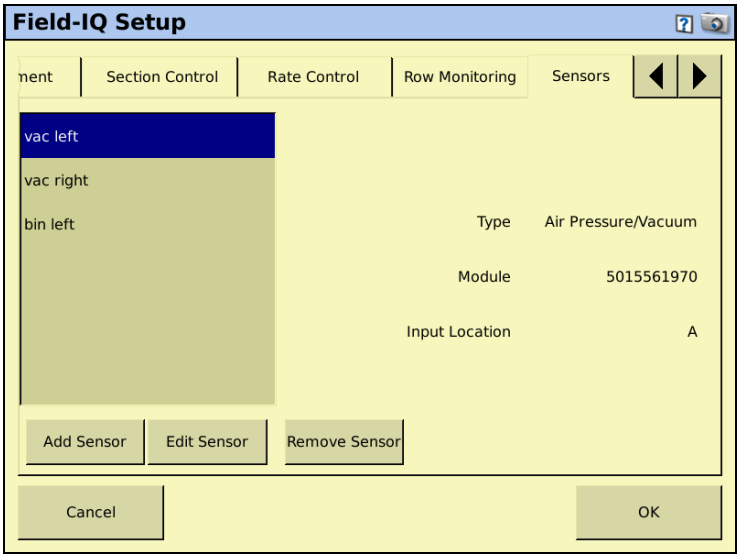
Row Monitoring tab



Setting	Description
Row Monitoring	Disabled: Row monitoring is turned off. Blockage: Select this option when using an air seeder or when applying granular material. Seed Count: Select this option for precision seeding.
Setup	Row Sensor Enable: Turn individual row sensors on or off. Row Sensor Wiring: Select which wire each row sensor is wired to.

Sensors tab

Add or edit sensor settings.

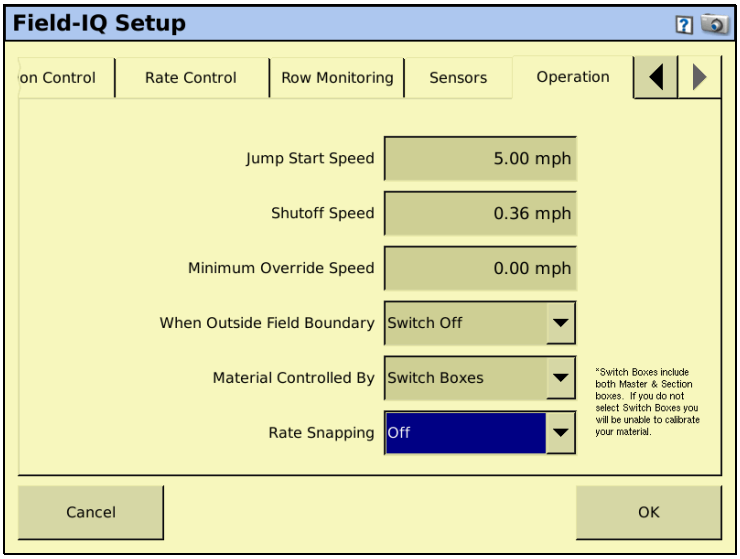


Setting	Description
Add Sensor	Add a new sensor.
Edit Sensor	Edit or view the settings for an existing sensor.
Remove Sensor	Delete an existing sensor.

When adding or editing a sensor, enter the following information:

Setting	Description
Sensor Type	Select from: • Air pressure/vacuum • Liquid pressure • NH3 pressure • Bin level • RPM • Gate Height
Name	Use the virtual keyboard to enter a name for the sensor.
Sensor Setup	Field-IQ module: Select the Field-IQ module that is controlling this sensor. Input location: Specify which wire is controlling the sensor.

Operation tab



Setting	
Jump Start Speed	This setting controls the speed to be used when the Field-IQ master switchbox Master switch is put in the jump start position. This manual override option can be used to operate the system when the vehicle is stationary. Jump start is also used when GPS has become unavailable.
Shutoff Speed	This setting controls when to shut the system down if the implement drops below the specified speed.
Minimum Override Speed	This setting maintains the application rate when the implement's actual speed drops below the value entered. It is used to ensure consistent material flow during slow speeds.
When Outside Field Boundary	Switch off: The system will not apply outside the boundary area. Operate: The system will apply outside the boundary area.
Material Controlled By	Enabled: The material is tied to the Master Switch Box and cannot be controlled individually. Disabled: The Material is not tied to the Master Switch box and is controlled by virtual buttons on the Run screen.
Rate Snapping	Enabled: Shows the applied rate the same as the target rate, if the applied rate is within 10% of the target rate. Disabled: Shows the actual applied value.

Material Setup Complete screen

When you have completed setting up a new material, the *Material Setup Complete* screen appears. You can select:

- **Add another material**: You are returned to the start of the *Field-IQ Setup Wizard*.
- **Finish Setup**: You are returned to the *Material Overview* screen.

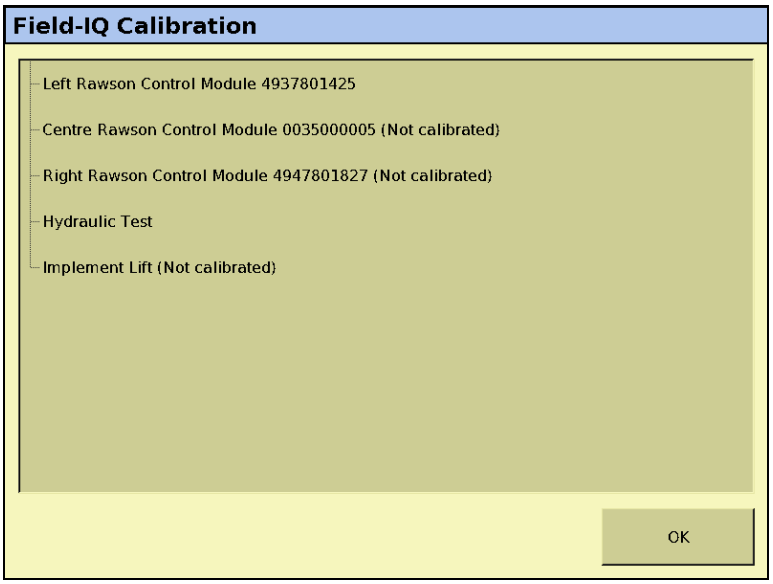
Calibrating the modules

Calibrate the modules to ensure that your system performs at the level you require.

The Field-IQ *Calibrate* option only appears on the *Configuration* screen if you have at least one Field-IQ Rawson control module or Rate control module set up to control the rate.

1. From the *Configuration* screen, select the Field-IQ plugin and then tap **Calibrate**.
2. From the *Field-IQ Calibration* screen, select the operation under the Module that you would like to calibrate. The message Not calibrated appears at the end of the modules that need calibration.

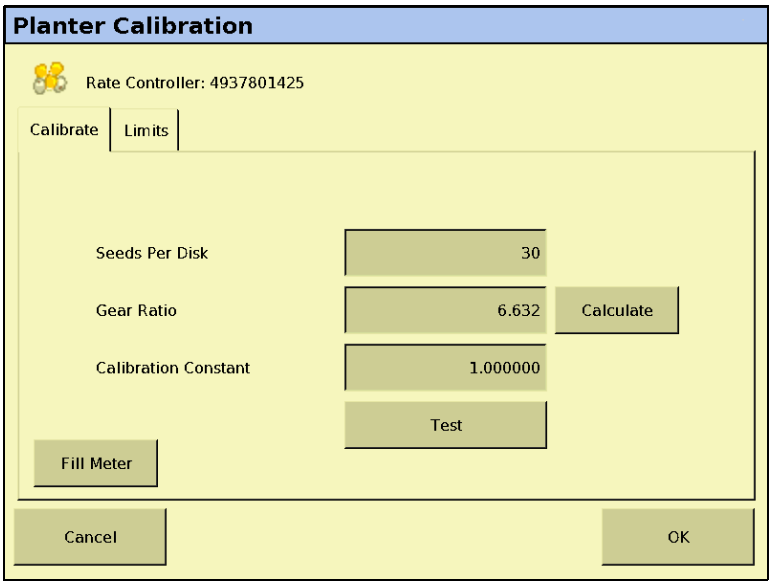
Note – *If you have an implement lift switch, calibrate it first. See* *Calibrating the implement lift switch, page 248**.*



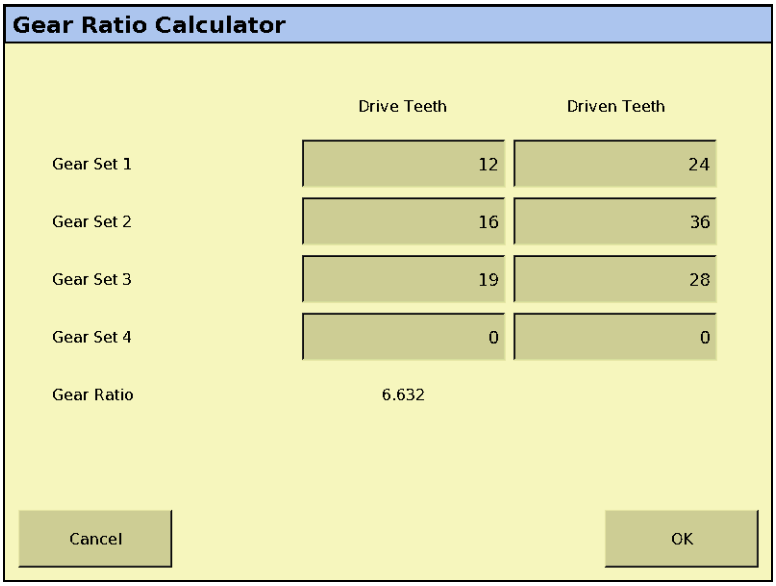
3. Select the first module to calibrate and then tap **OK**.

   The *Planter Calibration* screen appears.

4. In the *Seeds Per Disk field*, enter a value. This is the number of seeds each seed disk holds:



5. Enter a value in the *Gear Ratio* field or tap **Calculate**. If you tap **Calculate**, the following screen appears:



6. Use the Gear Ratio Calculator to determine the planter drive gear ratio and then tap **OK**.

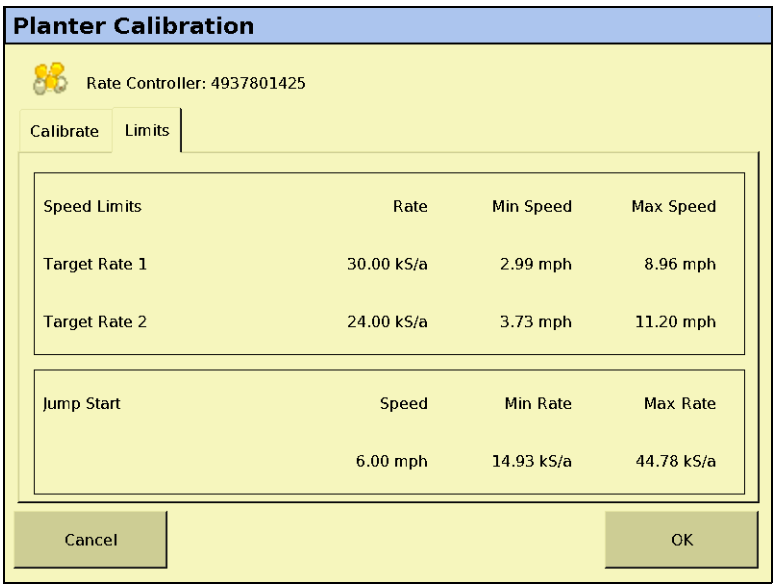
   The *Calibration Constant* field contains a calculated value that the system determines during calibration.

   This field allows adjustment for inconsistencies in the seed meters. To start out, Trimble recommends that you leave the value at 1.000. After the calibration test, the system may adjust this number.

7. Place a clean empty container under the rows that contain seeds to capture the seeds dispensed during the calibration.

CAUTION – Moving parts during this operation. Ensure the implement is safe to operate.

8. Tap **Test**:
   a. The system asks if you would like to prime the system. Tap **Yes**. To to ensure that the seed disk is full, the system turns the seed disks one revolution.
   b. Turn on the master switch to prime the system and then when prompted on-screen, turn off the master switch.
   c. In the *Number of Seed Meter Revolutions*, enter a value and then tap **Start**. The higher the number of revolutions the more accurate the calibration. Trimble recommends 5 to 10 revolutions.
   d. Follow the on-screen prompts of operating the master switch. After the system turns the specified number of revolutions, enter the number of seeds dispensed per row and then tap **Continue**.
   e. The next screen shows the minimum and maximum speeds for the target rate specified. Tap **OK** and then either press **Test** to repeat the calibration or tap **OK** to continue.
9. Select the *Limits* tab to show an overview of the limits that are set:



10. Tap **OK**.
11. Repeat Step 1 through Step 10 for other Rawson Control Modules that need calibration.

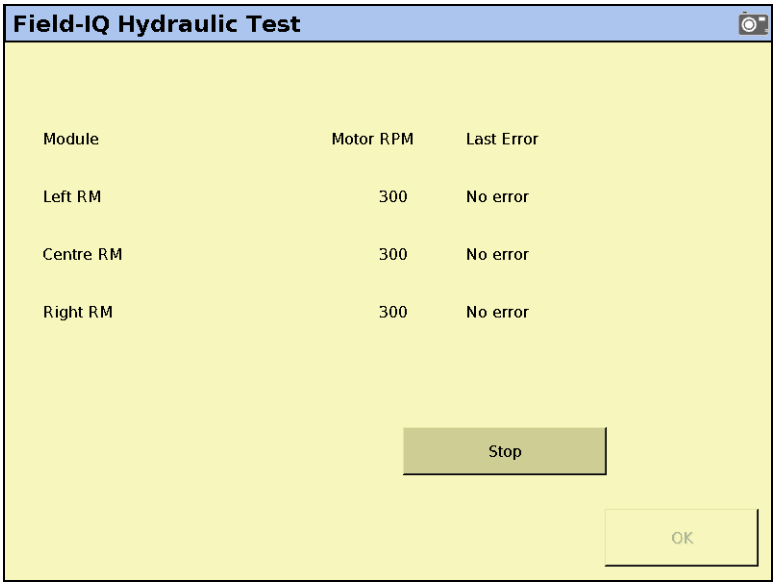
Hydraulic test

The purpose of this test is to exercise the hydraulics to establish whether there is sufficient oil flow to run the system.

1. From the Field-IQ *Calibration* screen tap **Hydraulic Test**.

CAUTION – Moving parts during this operation. Ensure the implement is safe to operate.

2. Tap **Next**.
3. Enter the initial motor RPM. The default setting is 300. Trimble also recommends that you test the motor RPM at 100 to ensure that the drive runs smoothly at slow speeds.
4. Tap **Start**.
5. The next screen provides the status of each motor:



No Error: The test was successful.

Motor Stalled: The motors did not have sufficient oil flow; ensure the correct orifice size is installed for each motor. For more information, refer to the *Rawson System Installation Instructions*.

Disconnected: The Rawson Control Module cannot communicate with the motor.

6. Tap **Stop** to return to the Field-IQ *Calibration* screen.

Calibrating the implement lift switch

1. From the *Field-IQ Calibration* screen, select the Implement Lift option.
2. Raise the implement and then tap **Next**.
3. Lower the implement and then tap **Next**.
4. Tap **OK** to return to the Field-IQ *Calibration* screen.

Operating in the field

1. From the Home screen, tap  .
2. From the *Current Configurations* screen, configure the display/vehicle/ implement settings and then tap **OK**.
3. From the *Field Selection* screen, select the required client/farm/field/event settings and then tap **OK**.

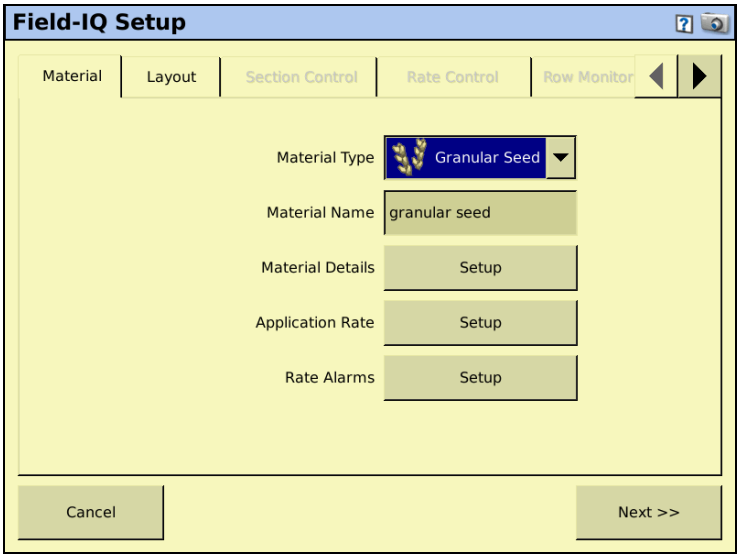
Setting up the Field-IQ system for Air Seeding

Make sure that you have set your implement to Seeder, and that you have configured the implement, see Configuring the display, page 75. In the *Material Overview* screen, tap **New** to open the Field-IQ Setup Wizard. The Wizard contains the following seven tabs:

For information on this tab...	See...
Material	page 233
Layout	page 234
Section Control	page 236
Rate Control	page 238
Row Monitoring	page 241
Sensors	page 242
Operation	page 243

Material tab

Enter information about the material you want to set up.

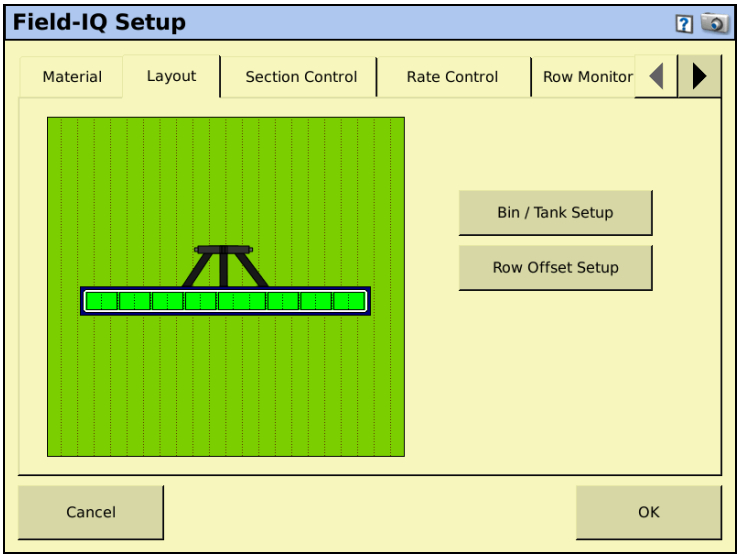


Setting	Description
Material Type	Select your Field-IQ application type: ***Note –*** *If spraying chemicals, use the liquid fertilizer setting.* • Row Crop Seed • Liquid • Granular Seed • Granular Fertilizer • Anhydrous
Material Name	Use the virtual keyboard to enter a name for the material.
Material Details	Tap **Setup** to open the *Hybrid Setup* screen. See Logging varieties, page 65.

Setting	Description
Application Rate	***Rates tab*** Adjust the following Rate settings: • Target Rate: This setting controls the volume that the implement supplies when the Rate switch is in position 1. • Target Rate 2: This setting controls the volume that the implement supplies when the Rate switch is in position 2. • Rate Increment: When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Manual Rate Increment: When the Rate switch is in the Manual position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Minimum Rate: This setting is the minimum rate that will be applied. • Maximum Rate: This setting is the maximum rate that will be applied
	Units tab Adjust the following Unit settings: • Seeds Per Pound: Enter the number of seeds per pound of the current material. • Target Rate Units: Choose what units your target rate will apply. • Bushel Weight: Enter the bushel weight of the current material.
Rate Alarms	Tap **Setup** to set alarm thresholds and adjust the way seed statistics are calculated: • Blockage Sensitivity/Alarm: When less than this amount of material is sensed for the number of seconds given.

Layout tab

Enter information about the implement that will be used to apply the material.

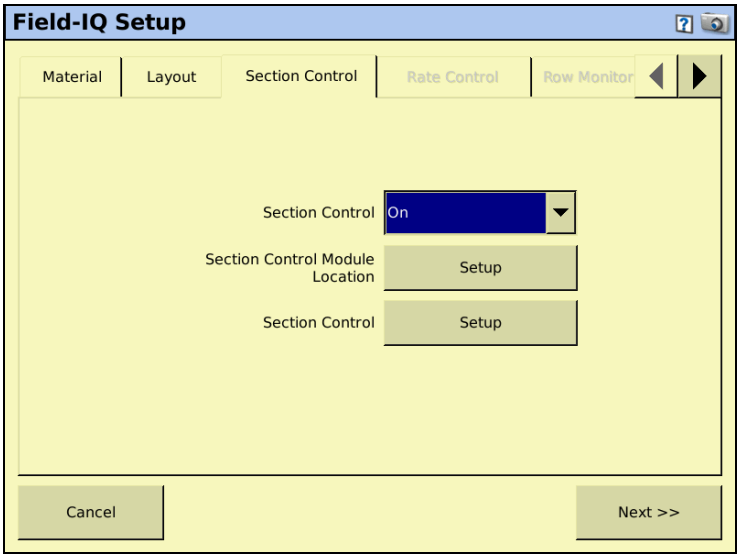


Setting	Description
Bin/Tank Setup	Allows the system to track how much material is left in the bin/tank, and provides a warning when the bin/tank needs to be refilled. Adjust the settings for: • Status: On: The system will track the bin/tank level and provide warnings. Off: The system will not track the bin/tank level or provide warnings. • Capacity Units: Select Default Units or Bushels. Default units will vary according to the type of material that is being applied. • Bin Capacity: The amount the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* • Current Volume: Current volume of the product in the tank. • Partial Refill: The amount of material that will be added to the bin/tank during a partial refill. • Warning Level: A warning will appear on your screen when your bin/tank reaches a set threshold. • Refill Tank/Bin: Refills the tank/bin to capacity. • Partial Refill Tank/Bin: Refills the tank/bin to the amount specified in the *Partial Refill* field.

Setting	Description
Row Offset Setup	Row Offset Setup provides additional tuning by detailing where the material will be applied in relation to the vehicle. Increase coverage accuracy by selecting one or two offsets. Row offsets are measured from the Application Offset that is entered in the Measurements tab of the Implement Configuration wizard. See Implement Configuration, Measurements, page 165. • Number of row offsets: Use 1 row offset when coverage is applied at a single location. Use two row offsets when planting singulated seed with staggered implements. • Row Offset (1 row offset): Enter the distance between the Application Offset and the row. • Rear Row Offset (2 row offset): Enter the distance between the Application Offset and the rear row. • Front Row Offset (2 row offset): Enter the distance between the Application Offset and the front row.

Section Control tab

Adjust the section control settings.

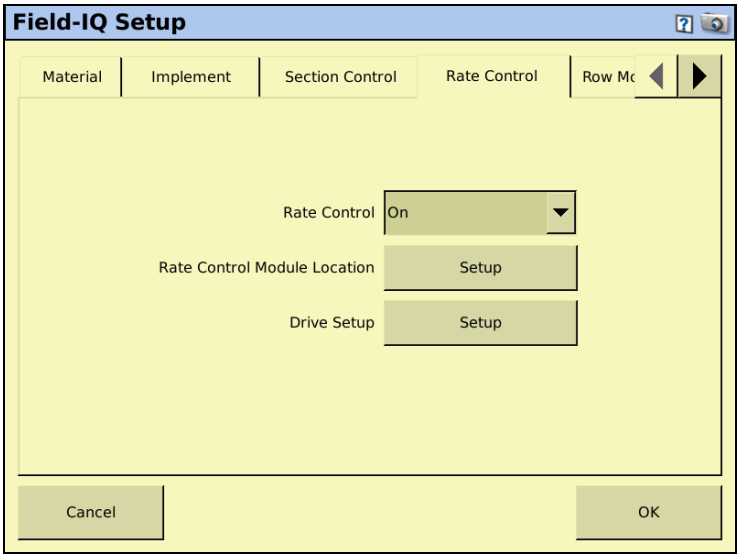


Setting	Description
Section Control	On: Enable section control for the current material. Off: Disable section control for the current material. Rate as Section: When a rate controller turns on or off, the section turns on or off. Link to Material: See Linking Materials, page 230.

Setting	Description
Section Control Module Setup	Tap **Setup** to configure the section control module(s), their location on the implement, and the number of sections they will control. Assign the Field-IQ module to the correct location to ensure it controls the correct section. • Number of Modules: Enter the number of Field-IQ section control modules you will use. • Module: Select the module number that corresponds to each section. • Number of Sections: Assign the number of sections that each module will control. • Section Grouping: Assign the rows that are in each section. • Advanced Wire Assignment: Every section is controlled by a specific wire on each Field-IQ module. Use this setting to specify which module each section is wired to.
Section Control	Tap **Setup** to adjust settings for each section control module. • Section Control Type: Select the type of section control for each module. • Off When Stopped: When set to Yes the control valve will close when ground speed reaches 0 with the master switch position in On. When set to No the control valve will hold its last position when the master switch is shut off and ground speed reaches 0—if the vehicle is a clutch-operated planter, set this option to *No* so that you can continue planting when the vehicle is stopped. Otherwise, select *Yes*. • On Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the On Latency value to compensate the delay, and the system will turn on in advance. • Off Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the Off Latency value to compensate for the delay, and the sytem will turn off after the set number of seconds. • Start Overlap: Enter the distance of intentional swath overlap when entering a previously applied area. The higher the number, the greater the overlapped area. • End Overlap: Enter the distance of intentional swath overlap when exiting a previously applied area. The higher the number, the greater the overlapped area. • Coverage Switching Overlap: Enter the percentage of the section width for intentional swath overlap. The higher the number, the greater the overlapped area before the section is turned off. • Boundary Switching Overlap: Enter the percentage of the section width for intentional overlap of a boundary. The higher the number, the greater the overlapped area into the boundary area.

Rate Control tab

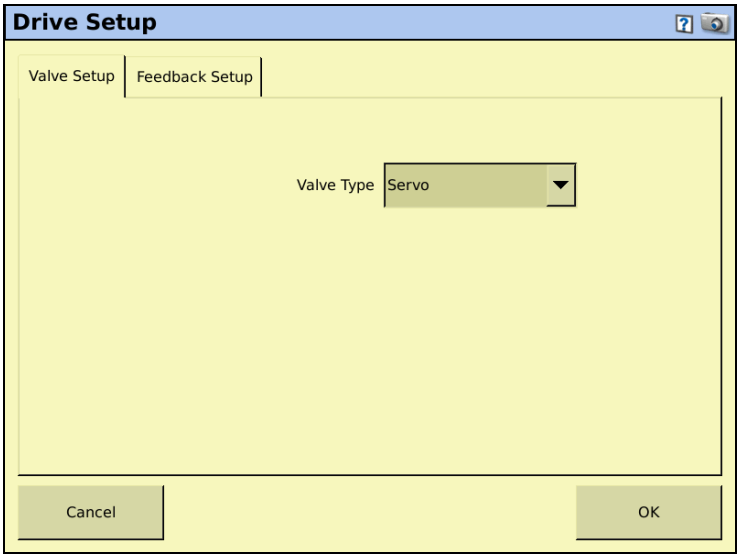
Adjust the rate control settings.



Setting	Description
Rate Control	On: The system sets the target rate. Off: Section switching only
Rate Control Module Location	Tap **Setup** to configure the rate control module(s), their location on the implement, and the width they will control.
Drive Setup	When you tap **Drive Setup**, a screen appears with the following tabs: • Valve Setup • Feedback Setup The tabs are explained in more detail on the following pages.

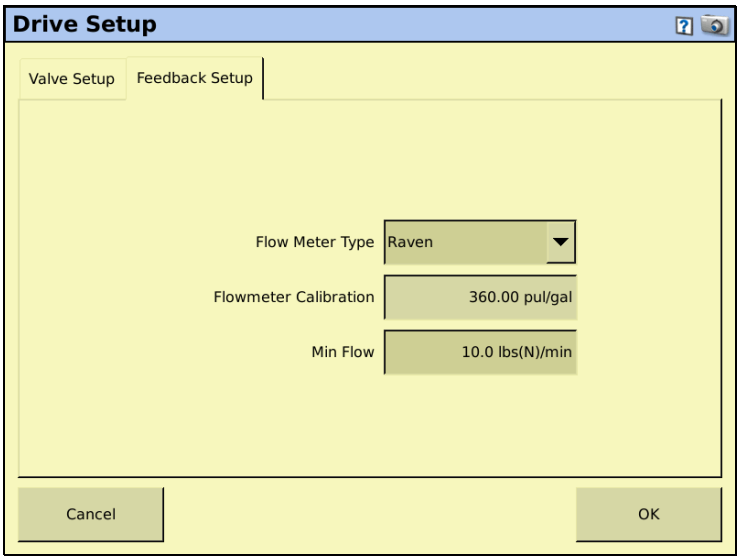
Drive Setup

Valve Setup tab



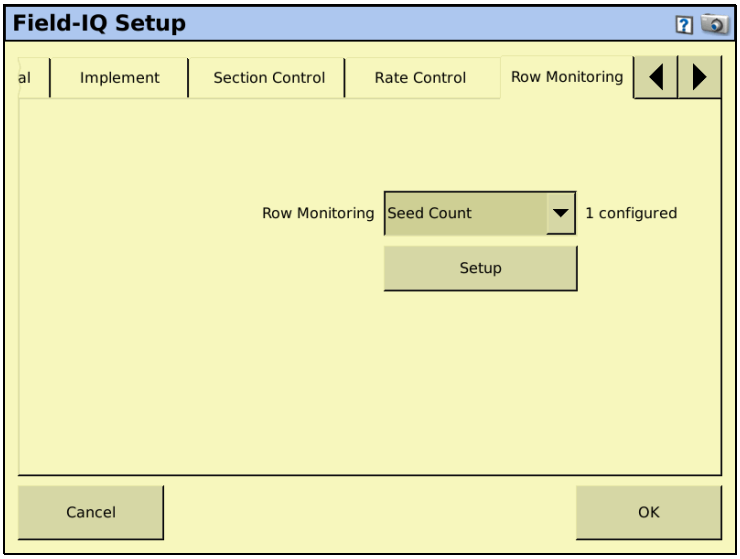
Setting	Description
Valve Type	Servo: 2-wire standard servo valve Fast Servo: 4-wire servo valve PWM: 2-wire PWM valve (commonly used to control hydraulic flow to the pump) Hardi % Bypass: Used on Hardi sprayers equipped with 3-way section valves that return flow to the tank when the boom section is off. Pump Servo: Servo valve (commonly used to control hydraulic flow to the pump). Linear Actuator: A valve that creates a linear motion (as opposed to a rotary motion). Electric over Hydraulic: A valve that uses electric current to control the hydraulic valve output.

Feedback Setup tab



Setting	Description
Flow Meter Type	Select the type of flow meter that is connected.
Flowmeter Calibration	Enter the number from the flow meter tag.
Min Flow	Enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.

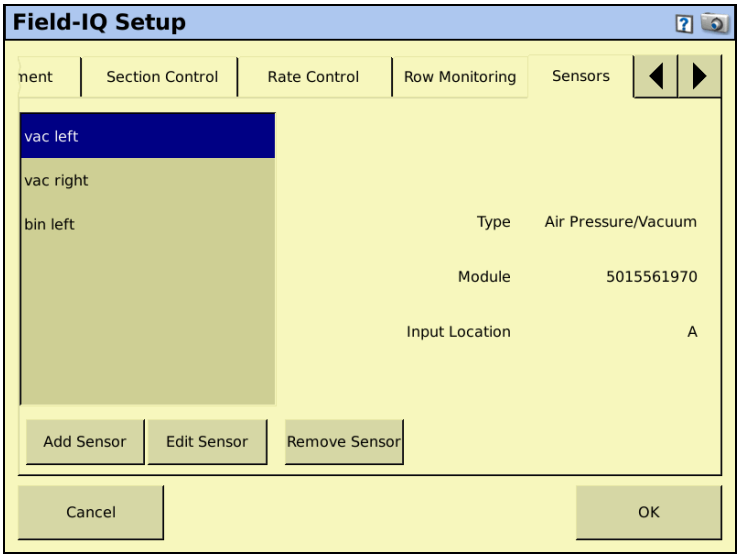
Row Monitoring tab



Setting	Description
Row Monitoring	Disabled: Turn row monitoring off. Blockage: Select this option for air seeding or when applying granular material. Seed Count: Select this option for precision seeding when planting.
Setup	Row Sensor Enable: Turn individual row sensors on or off. Row Sensor Wiring: Select which wire each row sensor is wired to.

Sensors tab

Add or edit sensor settings.

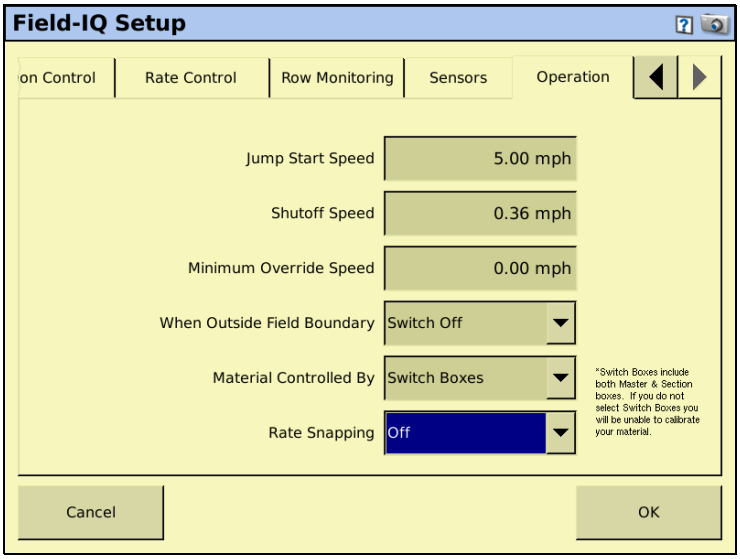


Setting	Description
Add Sensor	Add a new sensor.
Edit Sensor	Edit or view the settings for an existing sensor.
Remove Sensor	Delete an existing sensor.

When adding or editing a sensor, enter the following information:

Setting	Description
Sensor Type	Select from: • Air pressure/vacuum • Liquid pressure • NH3 pressure • Bin level • RPM • Gate Height
Name	Use the virtual keyboard to enter a name for the sensor.
Sensor Setup	Field-IQ module: Select the Field-IQ module that is controlling this sensor. Input location: Specify which wire is controlling the sensor.

Operation tab



Setting	
Jump Start Speed	This setting controls the speed to be used when the Field-IQ master switchbox Master switch is put in the jump start position. This manual override option can be used to operate the system when the vehicle is stationary. Jump start is also used when GPS has become unavailable.
Shutoff Speed	This setting controls when to shut the system down if the implement drops below the specified speed.
Minimum Override Speed	This setting maintains the application rate when the implement's actual speed drops below the value entered. It is used to ensure consistent material flow during slow speeds.
When Outside Field Boundary	Switch off: The system will not apply outside the boundary area. Operate: The system will apply outside the boundary area.
Material Controlled By	Enabled: The material is tied to the Master Switch Box and cannot be controlled individually. Disabled: The Material is not tied to the Master Switch box and is controlled by virtual buttons on the Run screen.
Rate Snapping	Enabled: Shows the applied rate the same as the target rate, if the applied rate is within 10% of the target rate. Disabled: Shows the actual applied value.

Material Setup Complete screen

When you have completed setting up a new material, the *Material Setup Complete* screen appears. You can select:

- **Add another material**. You are returned to the start of the *Field-IQ Setup Wizard*.
- **Finish Setup**. You are returned to the *Material Overview* screen.

Calibrating the modules

Calibrate the modules to ensure that your system performs at the level you require.

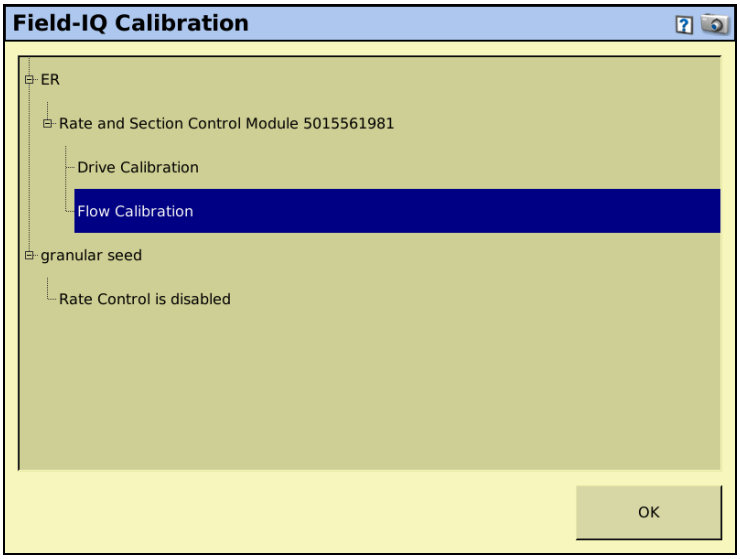
The Field-IQ *Calibrate* option only appears on the *Configuration* screen if you have at least one Field-IQ Rawson control module or Rate control module set up to control the rate.

1. From the *Configuration* screen, select the Field-IQ plugin and then tap **Calibrate**.
2. From the *Field-IQ Calibration* screen, select the operation under the Module that you would like to calibrate. The message Not calibrated appears at the end of the modules that need calibration.

Note – *Calibration screens will vary slightly if you are using a linear actuator.*

Note – *Before priming the system, the Automatic / Manual Switch on the master switch box must be in the manual position.*

Note – *If you have an impelement lift switch, calibrate it first. See* *Calibrating the implement lift switch, page 248.*

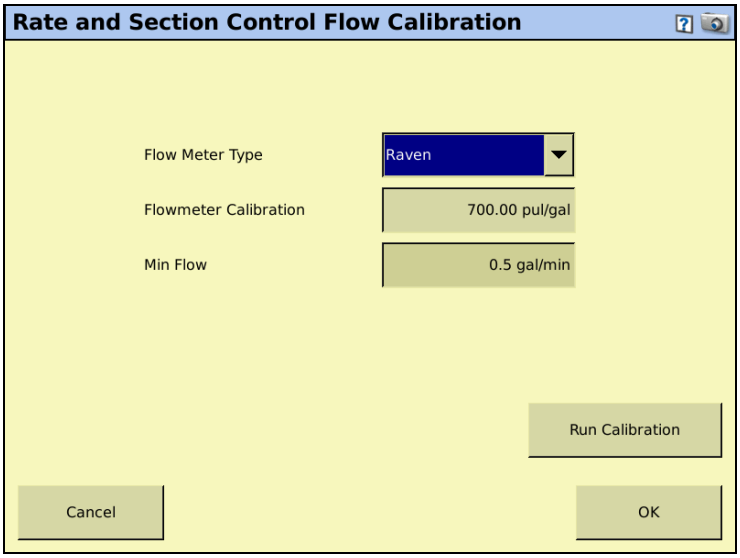


3. Select *Drive Calibration* and then tap **OK**. The *Drive Calibration* screen appears.

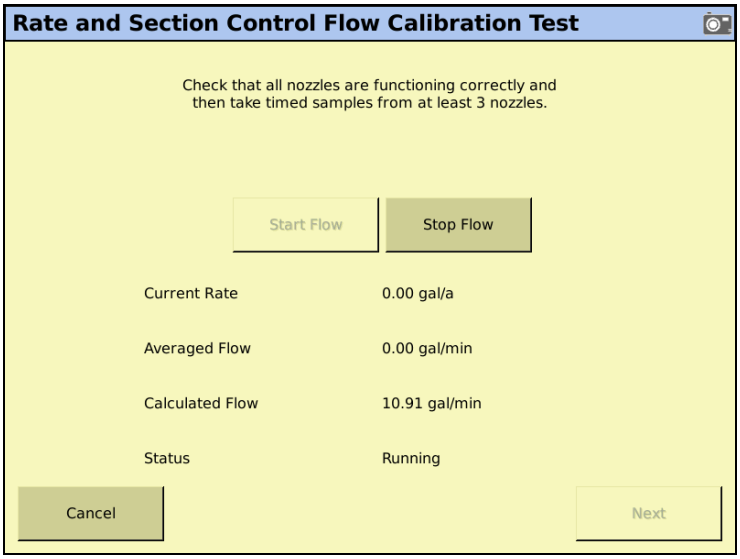
   The *Drive Calibration* screen has four tabs:

Tab	Description
Drive Limits	Enter the minimum and maximum flow values.
Auto-Tuning	⚠ **CAUTION –** Moving parts during this operation. Ensure the implement is safe to operate. Follow the on-screen instructions to auto tune the system. ***Note –*** *Do not perform the auto-tuning function if you have loaded a preset configuration file. Use the predefined configuration settings appropriate for your vehicle.*
Drive Settings	Turn the master switch on and vary the rates. Adjust values if needed.
Info	Shows the results and drive limits of your calibration.

4. Select *Flow Calibration* and then tap **OK**. The *Flow Calibration* screen appears.
5. In the *Rate and Section Control Flow Calibration* screen, enter the *Flow Meter* type, the *Flow Meter Calibration*, and the *Minimum Flow*:



6. Tap **Run Calibration** and then follow the on-screen instructions:



CAUTION – Moving parts during this operation. Ensure the implement is safe to operate.

Calibrating the implement lift switch

1. From the *Field-IQ Calibration* screen, select the Implement Lift option.
2. Raise the implement and then tap **Next**.
3. Lower the implement and then tap **Next**.
4. Tap **OK** to return to the Field-IQ *Calibration* screen.

Operating in the field

1. From the Home screen, tap  .
2. From the *Current Configurations* screen, configure the display/vehicle/ implement settings and then tap **OK**.
3. From the *Field Selection* screen, select the required client/farm/field/event settings and then tap **OK**.

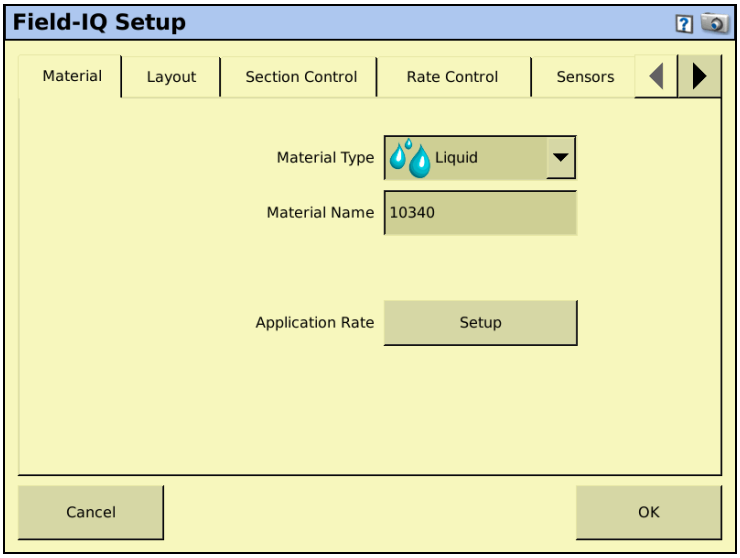
Setting up the Field-IQ system for Spraying

Make sure that you have set your implement to Sprayer, and that you have configured the implement, see Configuring the display, page 75. In the *Material Overview* screen, tap **New** to open the Field-IQ Setup Wizard. The Wizard contains the following seven tabs:

For information on this tab...	See...
Material	page 233
Layout	page 234
Section Control	page 236
Rate Control	page 238
Row Monitoring	page 241
Sensors	page 242
Operation	page 243

Material tab

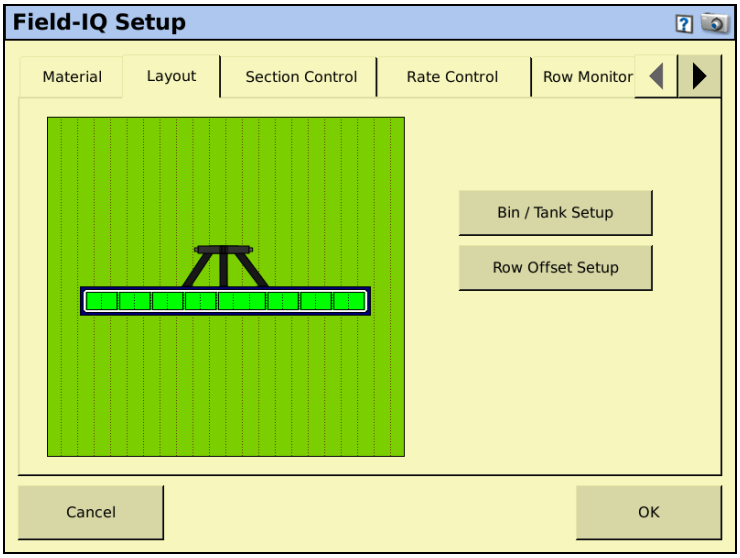
Enter information about the material you want to set up.



Setting	Description
Material Type	Select your Field-IQ application type: ***Note –*** *If spraying chemicals, use the liquid fertilizer setting.* • Row Crop Seed • Liquid • Granular Seed • Granular Fertilizer • Anhydrous
Material Name	Use the virtual keyboard to enter a name for the material.
Application Rate	***Rates tab*** Adjust the following Rate settings: • Target Rate: This setting controls the volume that the implement supplies when the Rate switch is in position 1. • Target Rate 2: This setting controls the volume that the implement supplies when the Rate switch is in position 2. • Rate Increment: When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Manual Rate Increment: When the Rate switch is in the Manual position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Minimum Rate: This setting is the minimum rate that will be applied. • Maximum Rate: This setting is the maximum rate that will be applied
	Units tab Adjust the following Unit settings: • Seeds Per Pound: Enter the number of seeds per pound of the current material. • Target Rate Units: Choose what units your target rate will apply. • Bushel Weight: Enter the bushel weight of the current material.

Layout tab

Enter information about the implement that will be used to apply the material.

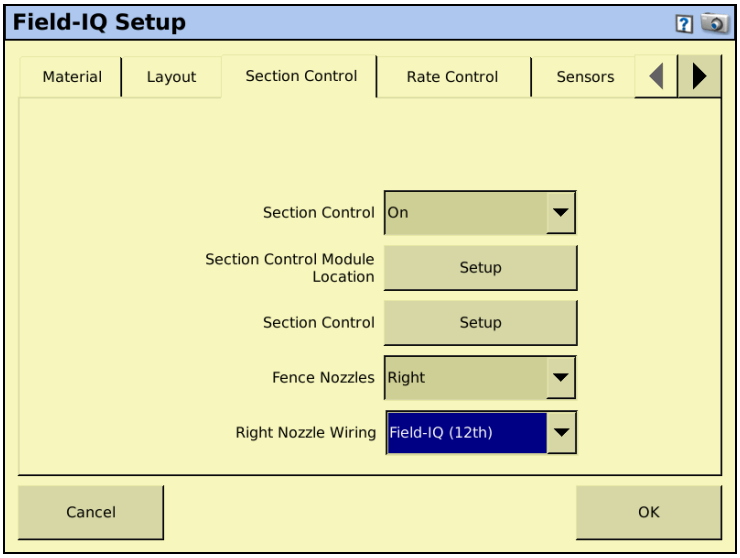


Setting	Description
Bin/Tank Setup	Allows the system to track how much material is left in the bin/tank, and provides a warning when the bin/tank needs to be refilled. Adjust the settings for: • Status: On: The system will track the bin/tank level and provide warnings. Off: The system will not track the bin/tank level or provide warnings. • Capacity Units: Select Default Units or Bushels. Default units will vary according to the type of material that is being applied. • Bin Capacity: The amount the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* • Current Volume: Current volume of the product in the tank. • Partial Refill: The amount of material that will be added to the bin/tank during a partial refill. • Warning Level: A warning will appear on your screen when your bin/tank reaches a set threshold. • Refill Tank/Bin: Refills the tank/bin to capacity. • Partial Refill Tank/Bin: Refills the tank/bin to the amount specified in the *Partial Refill* field.

Setting	Description
Row Offset Setup	Row Offset Setup provides additional tuning by detailing where the material will be applied in relation to the vehicle. Increase coverage accuracy by selecting one or two offsets. Row offsets are measured from the Application Offset that is entered in the Measurements tab of the Implement Configuration wizard. See Implement Configuration, Measurements, page 165. • Number of row offsets: Use 1 row offset when coverage is applied at a single location. Use two row offsets when planting singulated seed with staggered implements. • Row Offset (1 row offset): Enter the distance between the Application Offset and the row. • Rear Row Offset (2 row offset): Enter the distance between the Application Offset and the rear row. • Front Row Offset (2 row offset): Enter the distance between the Application Offset and the front row.

Section Control tab

Adjust the section control settings.

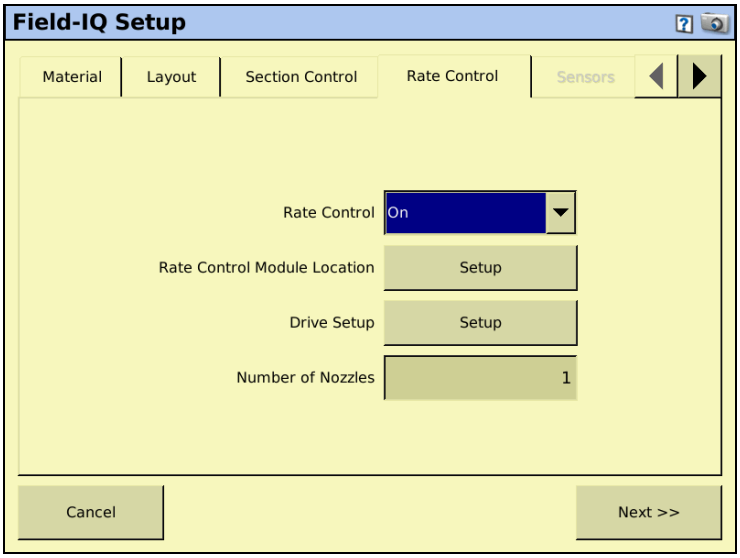


Setting	Description
Section Control	On: Enable section control for the current material. Off: Disable section control for the current material. Rate as Section: When a rate controller turns on or off, the section turns on or off. Link to Material: See Linking Materials, page 230.

Setting	Description
Section Control Module Setup	Tap **Setup** to configure the section control module(s), their location on the implement, and the number of sections they will control. Assign the Field-IQ module to the correct location to ensure it controls the correct section. • Number of Modules: Enter the number of Field-IQ section control modules you will use. • Module: Select the module number that corresponds to each section. • Number of Sections: Assign the number of sections that each module will control. • Section Grouping: Assign the rows that are in each section. • Advanced Wire Assignment: Every section is controlled by a specific wire on each Field-IQ module. Use this setting to specify which module each section is wired to.
Section Control	Tap **Setup** to adjust settings for each section control module. • Section Control Type: Select the type of section control for each module. • Off When Stopped: When set to Yes the control valve will close when ground speed reaches 0 with the master switch position in On. When set to No the control valve will hold its last position when the master switch is shut off and ground speed reaches 0—if the vehicle is a clutch-operated planter, set this option to *No* so that you can continue planting when the vehicle is stopped. Otherwise, select *Yes*. • On Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the On Latency value to compensate the delay, and the system will turn on in advance. • Off Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the Off Latency value to compensate for the delay, and the sytem will turn off after the set number of seconds. • Start Overlap: Enter the distance of intentional swath overlap when entering a previously applied area. The higher the number, the greater the overlapped area. • End Overlap: Enter the distance of intentional swath overlap when exiting a previously applied area. The higher the number, the greater the overlapped area. • Coverage Switching Overlap: Enter the percentage of the section width for intentional swath overlap. The higher the number, the greater the overlapped area before the section is turned off. • Boundary Switching Overlap: Enter the percentage of the section width for intentional overlap of a boundary. The higher the number, the greater the overlapped area into the boundary area.
Fence Nozzles	Many setups require a left fence nozzle to be configured, even when there is no left fence nozzle. For more information, refer to your sprayer installation instructions.
Right Nozzle Wiring	In you are using an EZ-Boom replacement harness, select the EZ-Boom setting. Otherwise, select the Field-IQ setting.

Rate Control tab

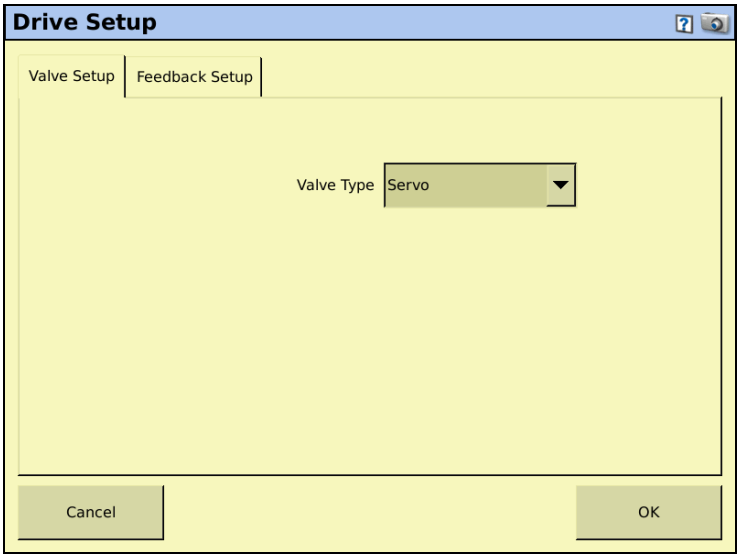
Adjust the rate control settings.



Setting	Description
Rate Control	On: The system sets the target rate. Off: Section switching only
Rate Control Module Location	Tap **Setup** to configure the rate control module(s), their location on the implement, and the width they will control.
Drive Setup	When you tap **Drive Setup**, a screen appears with the following tabs: • Valve Setup • Feedback Setup The tabs are explained in more detail on the following pages.
Number of Nozzles	Enter the number of spray nozzles on the sprayer.

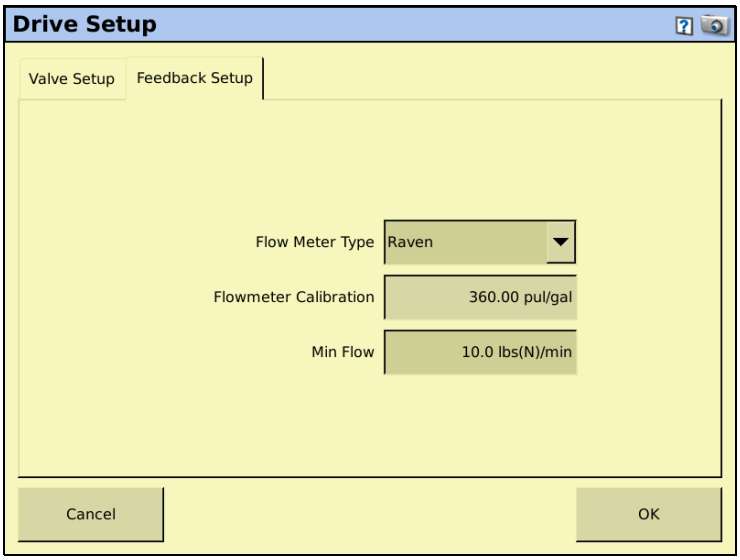
Drive Setup

Valve Setup tab



Setting	Description
Valve Type	Servo: 2-wire standard servo valve Fast Servo: 4-wire servo valve PWM: 2-wire PWM valve (commonly used to control hydraulic flow to the pump) Hardi % Bypass: Used on Hardi sprayers equipped with 3-way section valves that return flow to the tank when the boom section is off. Pump Servo: Servo valve (commonly used to control hydraulic flow to the pump). Linear Actuator: A valve that creates a linear motion (as opposed to a rotary motion). Electric over Hydraulic: A valve that uses electric current to control the hydraulic valve output.

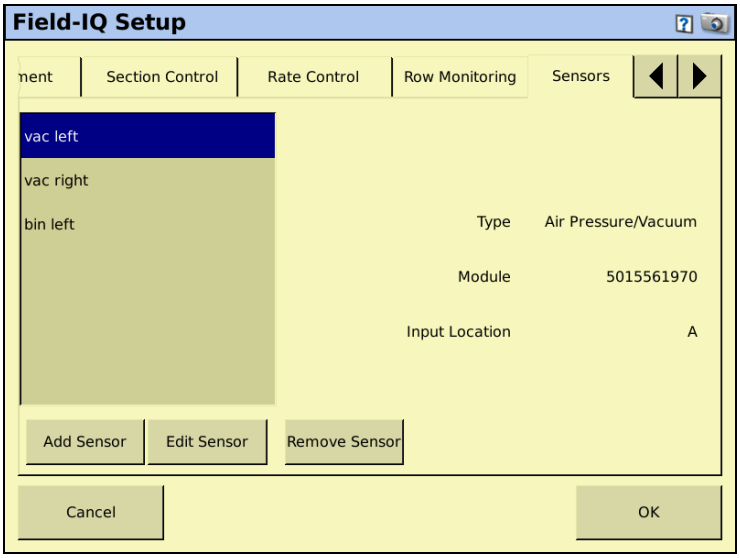
Feedback Setup tab



Setting	Description
Flow Meter Type	Select the type of flow meter that is connected.
Flowmeter Calibration	Enter the number from the flow meter tag.
Min Flow	Enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.

Sensors tab

Add or edit sensor settings.

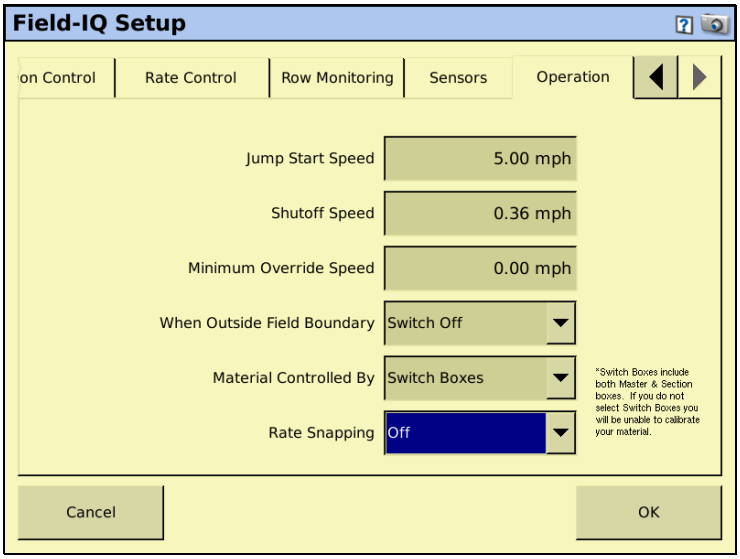


Setting	Description
Add Sensor	Add a new sensor.
Edit Sensor	Edit or view the settings for an existing sensor.
Remove Sensor	Delete an existing sensor.

When adding or editing a sensor, enter the following information:

Setting	Description
Sensor Type	Select from: • Air pressure/vacuum • Liquid pressure • NH3 pressure • Bin level • RPM • Gate Height
Name	Use the virtual keyboard to enter a name for the sensor.
Sensor Setup	Field-IQ module: Select the Field-IQ module that is controlling this sensor. Input location: Specify which wire is controlling the sensor.

Operation tab



Setting	
Jump Start Speed	This setting controls the speed to be used when the Field-IQ master switchbox Master switch is put in the jump start position. This manual override option can be used to operate the system when the vehicle is stationary. Jump start is also used when GPS has become unavailable.
Shutoff Speed	This setting controls when to shut the system down if the implement drops below the specified speed.
Minimum Override Speed	This setting maintains the application rate when the implement's actual speed drops below the value entered. It is used to ensure consistent material flow during slow speeds.
When Outside Field Boundary	Switch off: The system will not apply outside the boundary area. Operate: The system will apply outside the boundary area.
Material Controlled By	Enabled: The material is tied to the Master Switch Box and cannot be controlled individually. Disabled: The Material is not tied to the Master Switch box and is controlled by virtual buttons on the Run screen.
Rate Snapping	Enabled: Shows the applied rate the same as the target rate, if the applied rate is within 10% of the target rate. Disabled: Shows the actual applied value.

Material Setup Complete screen

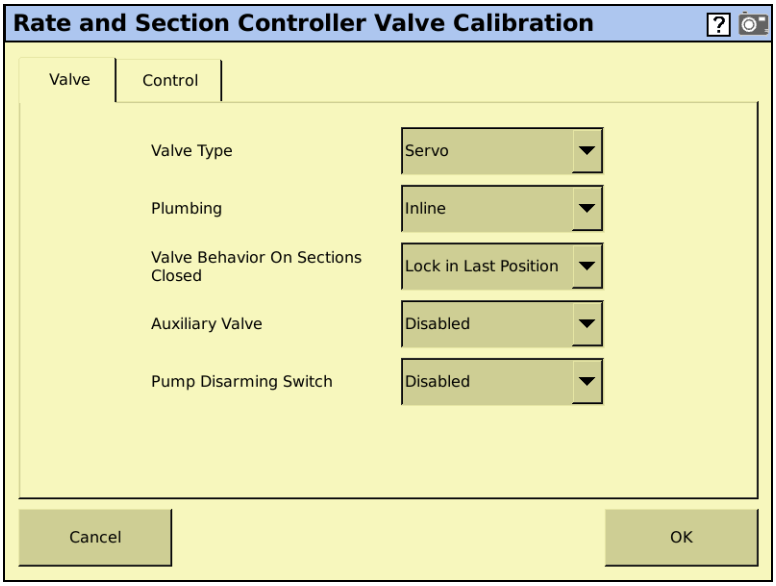
When you have completed setting up a new material, the *Material Setup Complete* screen appears. You can select:

- **Add another material**. You are returned to the start of the *Field-IQ Setup Wizard*.
- **Finish Setup**. You are returned to the *Material Overview* screen.

Calibrating the spraying modules

The Field-IQ *Calibrate* option only appears on the *Configuration* screen if you have at least one Field-IQ Rate and Section control module installed.

1. From the *Configuration* screen, select the Field-IQ plugin and then tap **Calibrate**.
2. From the *Field-IQ Calibration* screen, select the Rate and Section Control Module to be calibrated. The message Not calibrated appears at the end of the modules that need calibration.
3. Tap *Valve Calibration*. The following screen appears:



4. Select the *Valve* tab, and then select the appropriate value for each field:

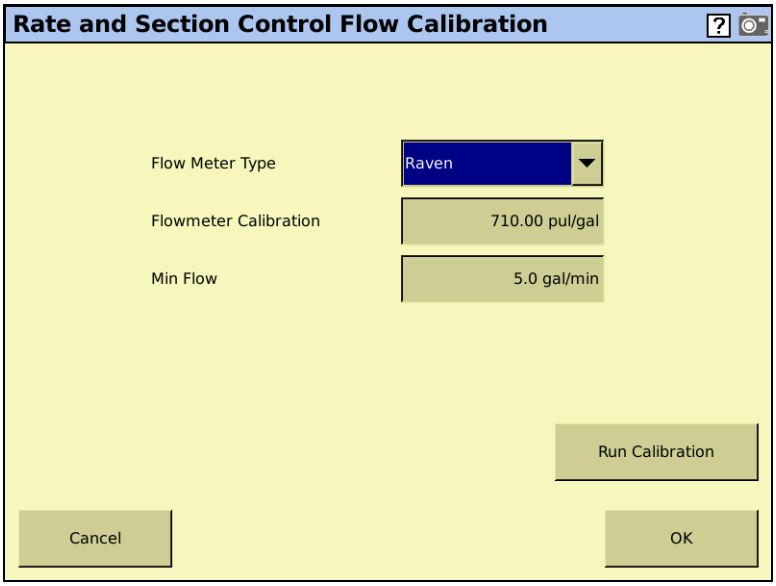
For this field ...	Select one of the following options ...
Valve Type	***Pump Servo***: The Pump Servo setting controls an electric motor which actuates a hydraulic valve. As the valve actuates, it adjusts the hydraulic flow to the pump. This valve adjusts the application rate indirectly.
	PWM: The PWM pump setting controls an electric solenoid valve which adjusts the hydraulic flow to the pump. This valve adjusts the application rate indirectly.
	Fast Servo: 4 wire electric motor turns a ball or butterfly valve to increase or decrease flow, for example, a DICKEY-john servo, Mid-Tech servo, or Raven Fast Valve
	Servo: 2 wire electric motor turns a ball or butterfly valve to increase or decrease flow, for example, a Raven standard servo.
	Hardi % bypass scenario: Most commonly used on Hardi sprayers equipped with 3 way section valves that return flow to tank when the boom section is off.
Plumbing	***Inline***: Valve is in the solution line going to the boom. The valve opens to increase application rate.
	Bypass: Valve is in the Return to Tank line. The valve closes to increase the application rate.
Valve Behavior on Sections Closed	***Close***: When all sections are off, the control valve returns to the closed position.
	Lock in Last Position: When all sections are off, the control valve remains in the last position. This setting allows the system to return to the target rate faster.

For this field ...	Select one of the following options ...
Auxiliary Valve	If you have an Auxiliary Valve installed, select one of the following: ***Master***: Valve closes when the system is turned off.
	Dump: Valve opens to dump flow to return line when the system is turned off.
Pump Disarming Switch	***Enable***: Select this option if you have a Pump Disarming Switch installed.

5. Select the *Control* tab. Enter a value for each of the following:
   - Allowable Error
   - Gain
   - Minimum Response

Note – *For information about the appropriate values for your sprayer, see the Getting Started Guide*

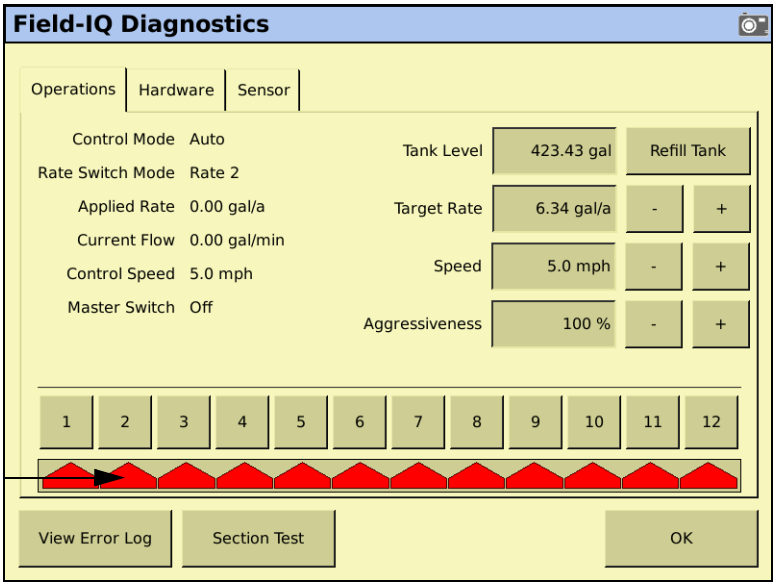
6. Tap **OK** to return to the main calibration screen, and then tap *Flow Calibration*. The following screen appears:



CAUTION – Moving parts during this operation. Ensure the implement is safe to operate.

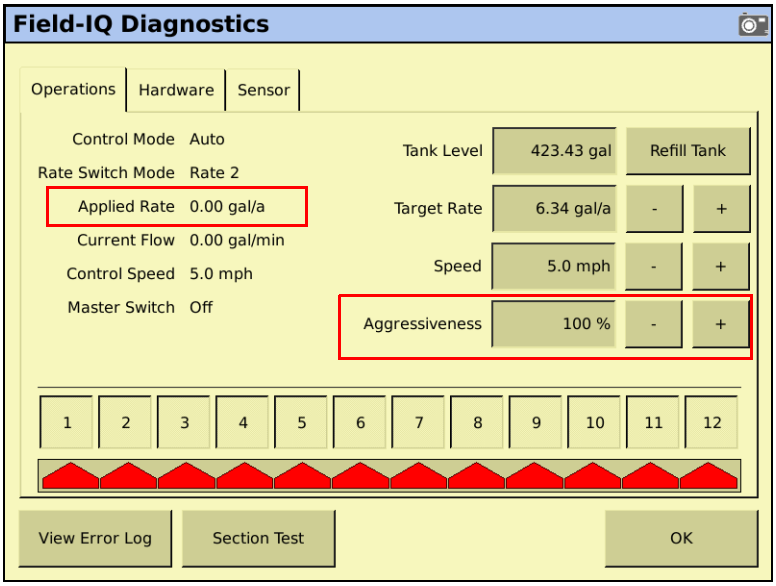
7. Tap **OK**. Enter a value for each of the following:
   - *Flow Meter Type*: select an option from the drop-down list.
   - *Flowmeter Calibration*: enter the number from the flow meter tag
   - *MinFlow*: enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.
8. Tap **Run Calibration**, and then follow the on-screen instructions.

9. If used, select the connector that the pressure sensor is connected to, and then enable the sensor.
10. Tap **Run Calibration**, and then follow the on-screen instructions.
11. Tap **OK** to return to the *Configuration* screen.
12. Select the *Field-IQ plugin* tab and then tap *Diagnostics*. The following screen appears:



13. To enable the sections, tap the numbered section tabs above each of the section icons.
14. Enter a value for each of the following:
    - *Target Rate*: The required rate for the rate switch
    - *Speed*

15. Operate the sprayer, and check value shown for the *Applied Rate*. If necessary, adjust the *Aggressiveness* setting to achieve the desired rate.



Calibrating the implement lift switch

1. From the *Field-IQ Calibration* screen, select the Implement Lift option.
2. Raise the implement and then tap **Next**.
3. Lower the implement and then tap **Next**.
4. Tap **OK** to return to the Field-IQ *Calibration* screen.

Operating in the field

1. From the Home screen, tap  .
2. From the *Current Configurations* screen, configure the display/vehicle/ implement settings and then tap **OK**.
3. From the *Field Selection* screen, select the required client/farm/field/event settings and then tap **OK**.

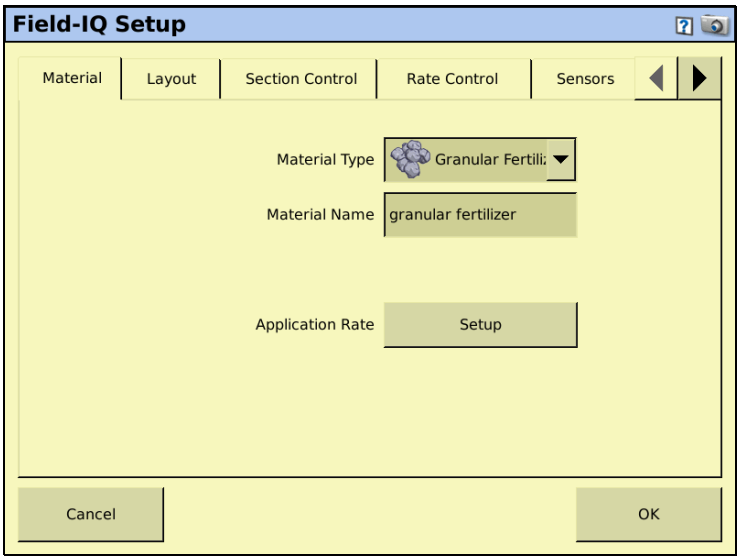
Setting up the Field-IQ system for Spreading

Make sure that you have set your implement to Spreading, and that you have configured the implement, see Configuring the display, page 75. In the *Material Overview* screen, tap **New** to open the Field-IQ Setup Wizard. The Wizard contains the following seven tabs:

For information on this tab...	See...
Material	page 233
Layout	page 234
Section Control	page 236
Rate Control	page 238
Row Monitoring	page 241
Sensors	page 242
Operation	page 243

Material tab

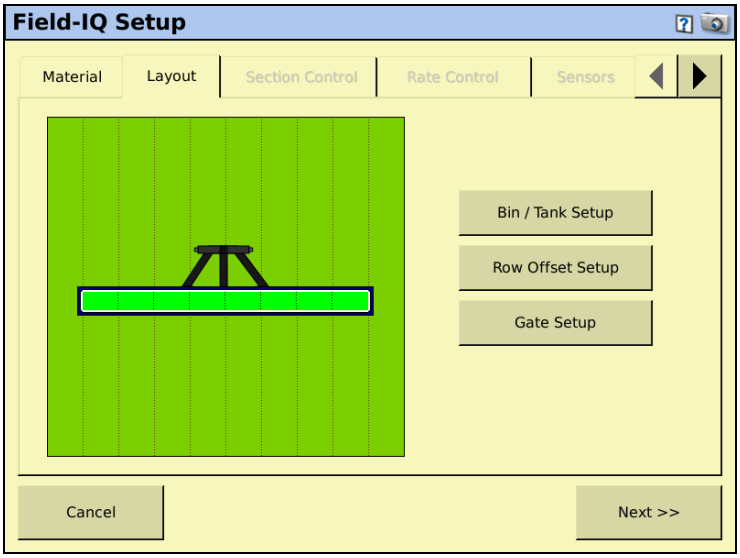
Enter information about the material you want to set up.



Setting	Description
Material Type	Select your Field-IQ application type: ***Note –*** *If spraying chemicals, use the liquid fertilizer setting.* • Row Crop Seed • Liquid • Granular Seed • Granular Fertilizer • Anhydrous
Material Name	Use the virtual keyboard to enter a name for the material.
Application Rate	***Rates tab*** Adjust the following Rate settings: • Target Rate: This setting controls the volume that the implement supplies when the Rate switch is in position 1. • Target Rate 2: This setting controls the volume that the implement supplies when the Rate switch is in position 2. • Rate Increment: When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Manual Rate Increment: When the Rate switch is in the Manual position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Minimum Rate: This setting is the minimum rate that will be applied. • Maximum Rate: This setting is the maximum rate that will be applied
	Units tab Adjust the following Unit settings: • Seeds Per Pound: Enter the number of seeds per pound of the current material. • Target Rate Units: Choose what units your target rate will apply. • Bushel Weight: Enter the bushel weight of the current material.

Layout tab

Enter information about the implement that will be used to apply the material.

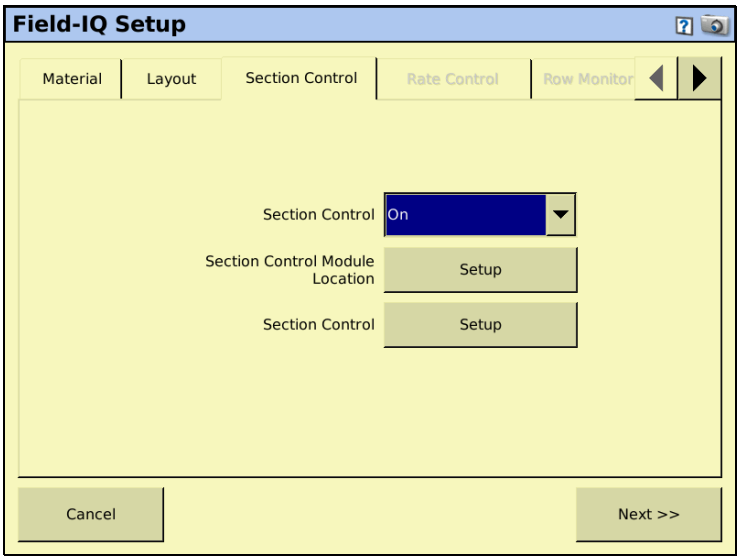


Setting	Description
Bin/Tank Setup	Allows the system to track how much material is left in the bin/tank, and provides a warning when the bin/tank needs to be refilled. Adjust the settings for: • Status: On: The system will track the bin/tank level and provide warnings. Off: The system will not track the bin/tank level or provide warnings. • Capacity Units: Select Default Units or Bushels. Default units will vary according to the type of material that is being applied. • Bin Capacity: The amount the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* • Current Volume: Current volume of the product in the tank. • Partial Refill: The amount of material that will be added to the bin/tank during a partial refill. • Warning Level: A warning will appear on your screen when your bin/tank reaches a set threshold. • Refill Tank/Bin: Refills the tank/bin to capacity. • Partial Refill Tank/Bin: Refills the tank/bin to the amount specified in the *Partial Refill* field.

Setting	Description
Row Offset Setup	Row Offset Setup provides additional tuning by detailing where the material will be applied in relation to the vehicle. Increase coverage accuracy by selecting one or two offsets. Row offsets are measured from the Application Offset that is entered in the Measurements tab of the Implement Configuration wizard. See Implement Configuration, Measurements, page 165. • Number of row offsets: Use 1 row offset when coverage is applied at a single location. Use two row offsets when planting singulated seed with staggered implements. • Row Offset (1 row offset): Enter the distance between the Application Offset and the row. • Rear Row Offset (2 row offset): Enter the distance between the Application Offset and the rear row. • Front Row Offset (2 row offset): Enter the distance between the Application Offset and the front row.
Gate Setup	Enter the following measurements: • Gate Height • Gate Width • Drag chain length per turn of the drag shaft

Section Control tab

Adjust the section control settings.

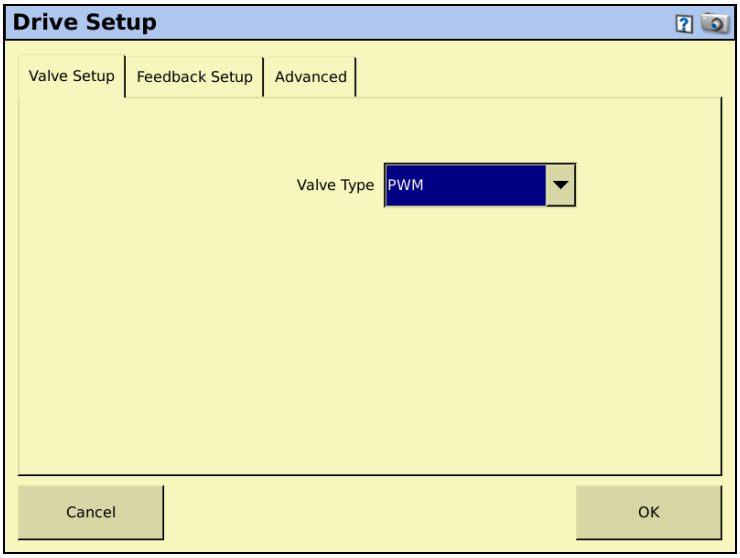


Setting	Description
Section Control	On: Enable section control for the current material. Off: Disable section control for the current material. Rate as Section: When a rate controller turns on or off, the section turns on or off. Link to Material: See Linking Materials, page 230.

Setting	Description
Section Control Module Setup	Tap **Setup** to configure the section control module(s), their location on the implement, and the number of sections they will control. Assign the Field-IQ module to the correct location to ensure it controls the correct section. • Number of Modules: Enter the number of Field-IQ section control modules you will use. • Module: Select the module number that corresponds to each section. • Number of Sections: Assign the number of sections that each module will control. • Section Grouping: Assign the rows that are in each section. • Advanced Wire Assignment: Every section is controlled by a specific wire on each Field-IQ module. Use this setting to specify which module each section is wired to.
Section Control	Tap **Setup** to adjust settings for each section control module. • Section Control Type: Select the type of section control for each module. • Off When Stopped: When set to Yes the control valve will close when ground speed reaches 0 with the master switch position in On. When set to No the control valve will hold its last position when the master switch is shut off and ground speed reaches 0—if the vehicle is a clutch-operated planter, set this option to *No* so that you can continue planting when the vehicle is stopped. Otherwise, select *Yes*. • On Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the On Latency value to compensate the delay, and the system will turn on in advance. • Off Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the Off Latency value to compensate for the delay, and the sytem will turn off after the set number of seconds. • Start Overlap: Enter the distance of intentional swath overlap when entering a previously applied area. The higher the number, the greater the overlapped area. • End Overlap: Enter the distance of intentional swath overlap when exiting a previously applied area. The higher the number, the greater the overlapped area. • Coverage Switching Overlap: Enter the percentage of the section width for intentional swath overlap. The higher the number, the greater the overlapped area before the section is turned off. • Boundary Switching Overlap: Enter the percentage of the section width for intentional overlap of a boundary. The higher the number, the greater the overlapped area into the boundary area.

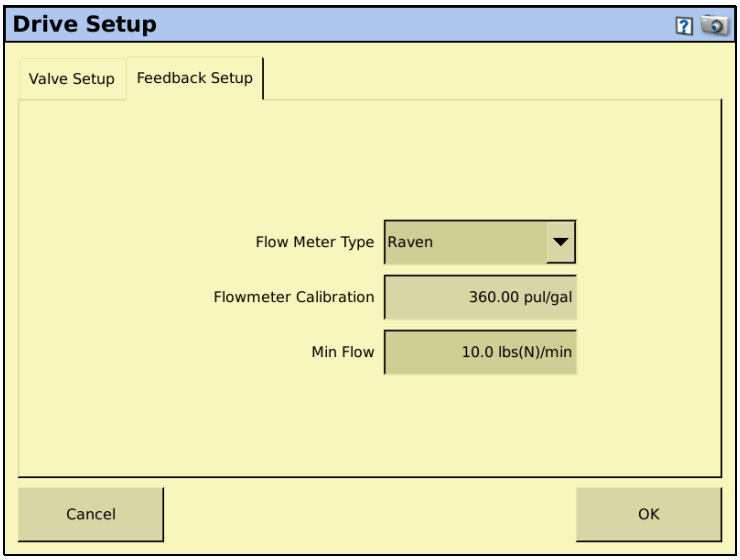
Drive Setup

Valve Setup tab



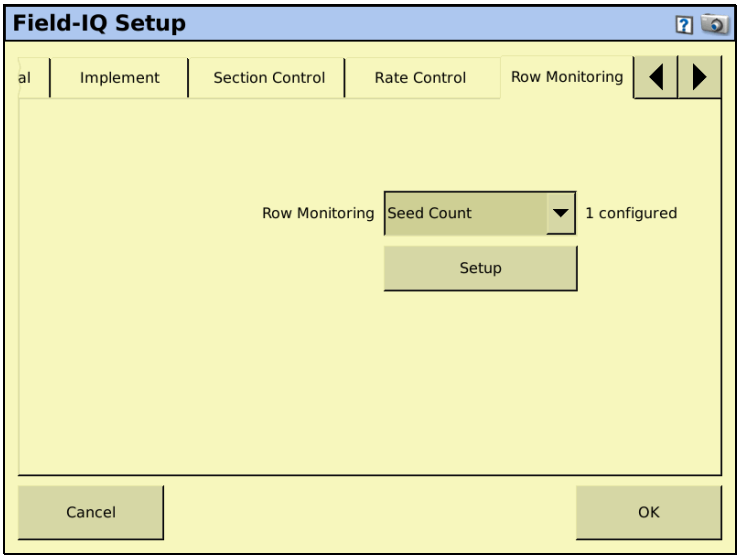
Setting	Description
Valve Type	Servo: 2-wire standard servo valve Fast Servo: 4-wire servo valve PWM: 2-wire PWM valve (commonly used to control hydraulic flow to the pump) Hardi % Bypass: Used on Hardi sprayers equipped with 3-way section valves that return flow to the tank when the boom section is off. Pump Servo: commonly used for anhydrous application. Linear Actuator: A valve that creates a linear motion (as opposed to a rotary motion). Electric over Hydraulic: A valve that uses electric current to power the solenoid.

Feedback Setup tab



Setting	Description
Flow Meter Type	Select the type of flow meter that is connected.
Flowmeter Calibration	Enter the number from the flow meter tag.
Min Flow	Enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.

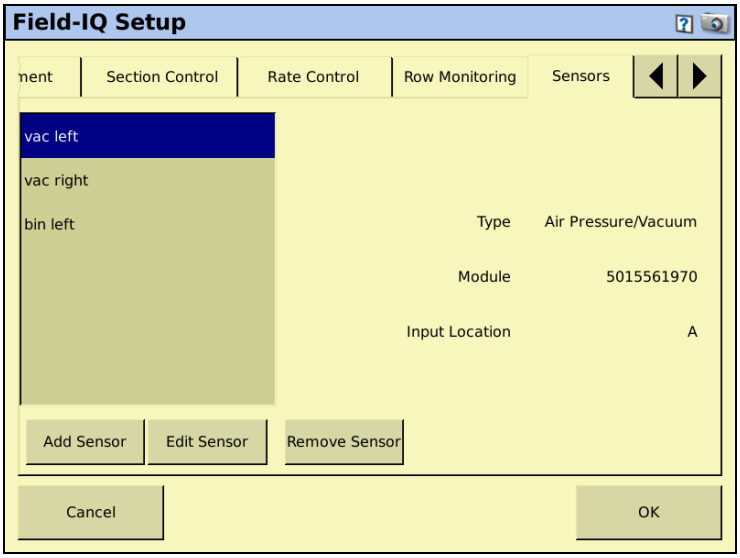
Row Monitoring tab



Setting	Description
Row Monitoring	Disabled: Row monitoring is turned off. Blockage: Select this option when using an air seeder or when applying granular material. Seed Count: Select this option for precision seeding.
Setup	Row Sensor Enable: Turn individual row sensors on or off. Row Sensor Wiring: Select which wire each row sensor is wired to.

Sensors tab

Add or edit sensor settings.

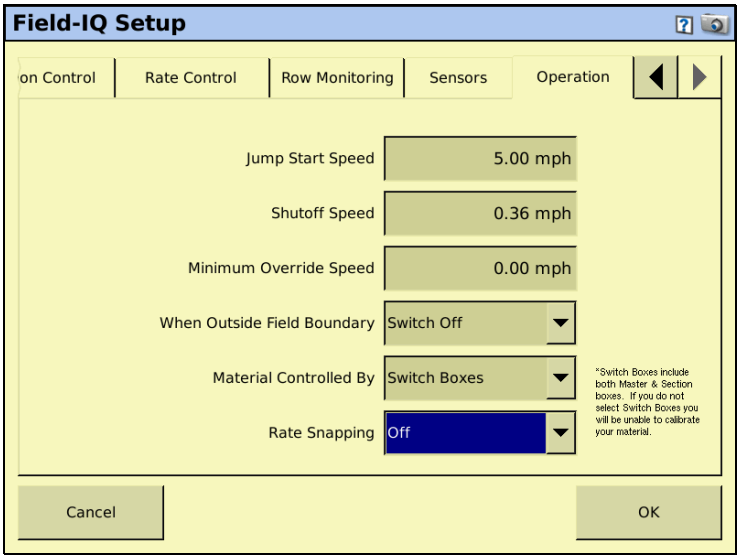


Setting	Description
Add Sensor	Add a new sensor.
Edit Sensor	Edit or view the settings for an existing sensor.
Remove Sensor	Delete an existing sensor.

When adding or editing a sensor, enter the following information:

Setting	Description
Sensor Type	Select from: • Air pressure/vacuum • Liquid pressure • NH3 pressure • Bin level • RPM • Gate Height
Name	Use the virtual keyboard to enter a name for the sensor.
Sensor Setup	Field-IQ module: Select the Field-IQ module that is controlling this sensor. Input location: Specify which wire is controlling the sensor.

Operation tab



Setting	
Jump Start Speed	This setting controls the speed to be used when the Field-IQ master switchbox Master switch is put in the jump start position. This manual override option can be used to operate the system when the vehicle is stationary. Jump start is also used when GPS has become unavailable.
Shutoff Speed	This setting controls when to shut the system down if the implement drops below the specified speed.
Minimum Override Speed	This setting maintains the application rate when the implement's actual speed drops below the value entered. It is used to ensure consistent material flow during slow speeds.
When Outside Field Boundary	Switch off: The system will not apply outside the boundary area. Operate: The system will apply outside the boundary area.
Material Controlled By	Enabled: The material is tied to the Master Switch Box and cannot be controlled individually. Disabled: The Material is not tied to the Master Switch box and is controlled by virtual buttons on the Run screen.
Rate Snapping	Enabled: Shows the applied rate the same as the target rate, if the applied rate is within 10% of the target rate. Disabled: Shows the actual applied value.

Material Setup Complete screen

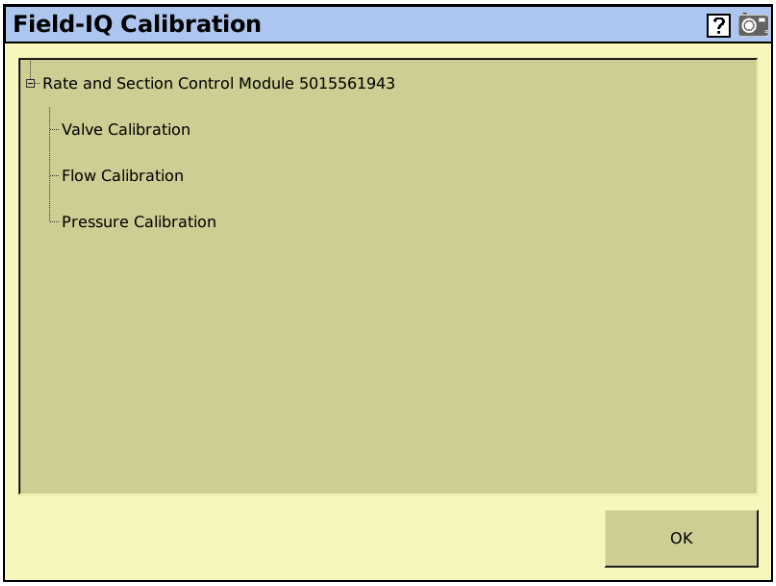
When you have completed setting up a new material, the *Material Setup Complete* screen appears. You can select:

- **Add another material**. You are returned to the start of the *Field-IQ Setup Wizard*.
- **Finish Setup**. You are returned to the *Material Overview* screen.

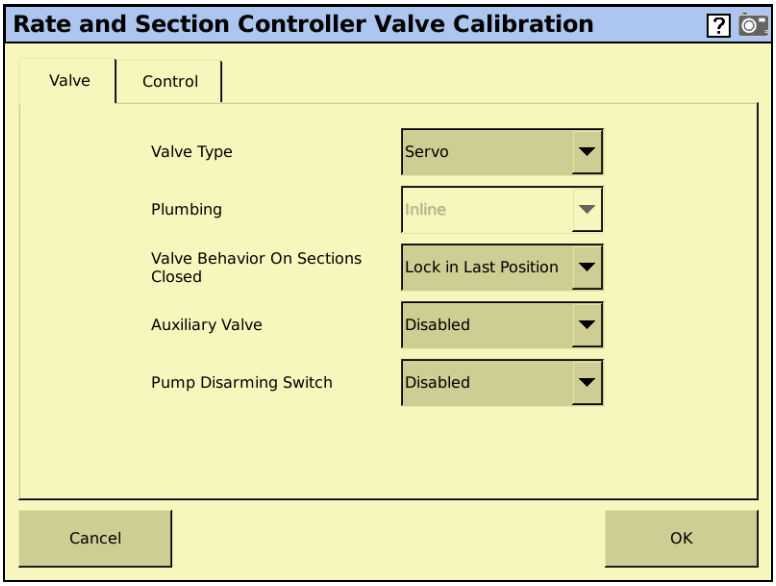
Calibrating the modules

The Field-IQ *Calibration* option only appears on the *Configuration* screen if you have at least one Field-IQ Rate and Section control module installed.

1. From the *Configuration* screen, select the Field-IQ plugin and then tap **Calibrate**.
2. From the *Field-IQ Calibration* screen, select the Rate and Section Control Module to be calibrated. (The message Not calibrated appears at the end of the modules that need calibration.) The following screen appears:



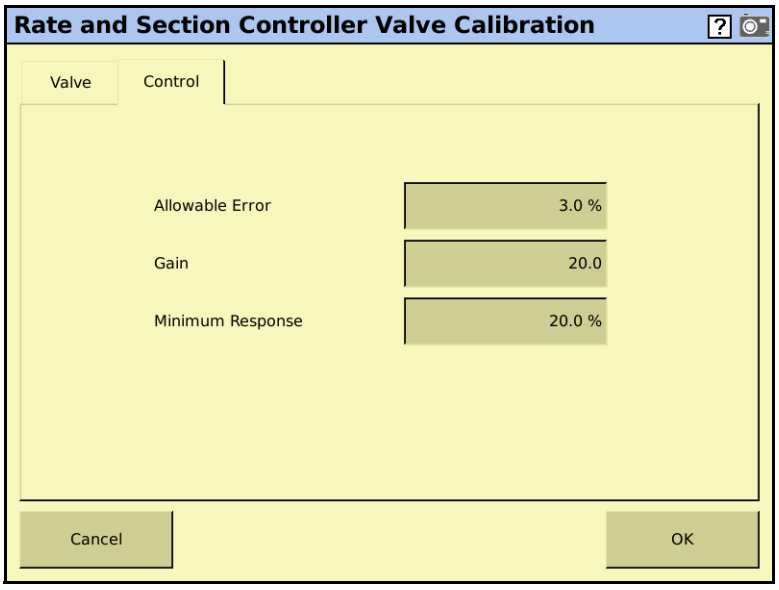
3. Tap *Valve Calibration*. The following screen appears:



4. Select the *Valve* tab and then select the appropriate value for each field:

For this field ...	Select one of the following options ...
Valve Type	***Pump Servo***: The Pump Servo setting controls an electric motor which actuates a hydraulic valve. As the valve actuates, it adjusts the hydraulic flow to the pump. This valve adjusts the application rate indirectly.
	PWM: The PWM pump setting controls an electric solenoid valve which adjusts the hydraulic flow to the pump. This valve adjusts the application rate indirectly.
	Fast Servo: A 4 wire electric motor turns a ball or butterfly valve to increase or decrease flow, for example a DICKEY-john servo, Mid-Tech servo, or Raven Fast Valve.
	Servo: A 2 wire electric motor turns a ball or butterfly valve to increase or decrease flow, for example a Raven standard servo.
	Hardi % bypass scenario: Most commonly used on Hardi sprayers equipped with 3 way section valves that return flow to tank when the boom section is off.
Plumbing	***Inline***: Valve is in the solution line going to the boom. The valve opens to increase application rate.
	Bypass: Valve is in the Return to Tank line. The valve closes to increase the application rate.
Valve Behavior on Sections Closed	***Close***: When all sections are off, the control valve returns to the closed position.
	Lock in Last Position: When all sections are off, the control valve remains in the last position. This setting allows the system to return to the target rate faster.
Auxiliary Valve	If you have an Auxiliary Valve installed, select one of the following: ***Master***: Valve closes when the system is turned off.
	Dump: Valve opens to dump flow to return line when the system is turned off.
Pump Disarming Switch	***Enable***: Select this option if you have a Pump Disarming Switch installed.

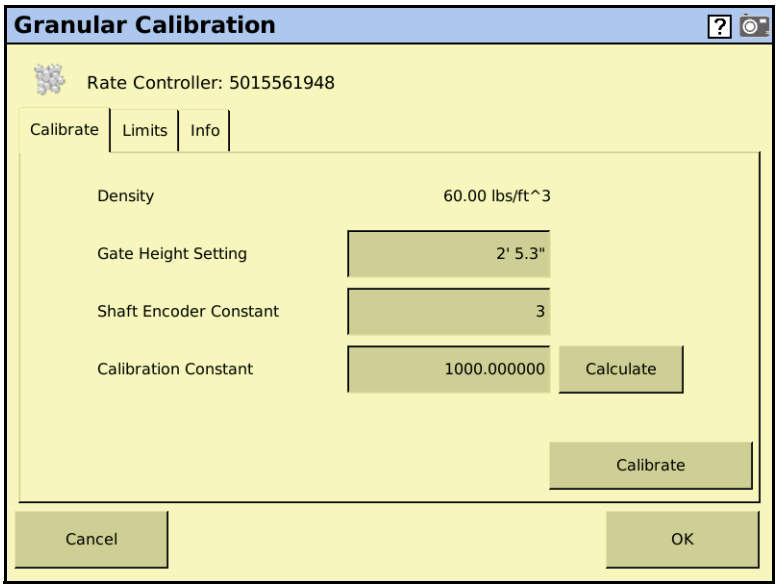
5. Select the *Control* tab:



6. Enter the following values:
   - *Allowable Error*
   - *Gain*
   - *Minimum Response.*

Note – *For information about the appropriate values for your sprayer, see the Support Note - Field-IQ Crop Input Control System: For Sprayers and Spreaders.*

7. Tap **OK** to return to the main calibration screen, and then tap *Flow Calibration*. The following screen appears:

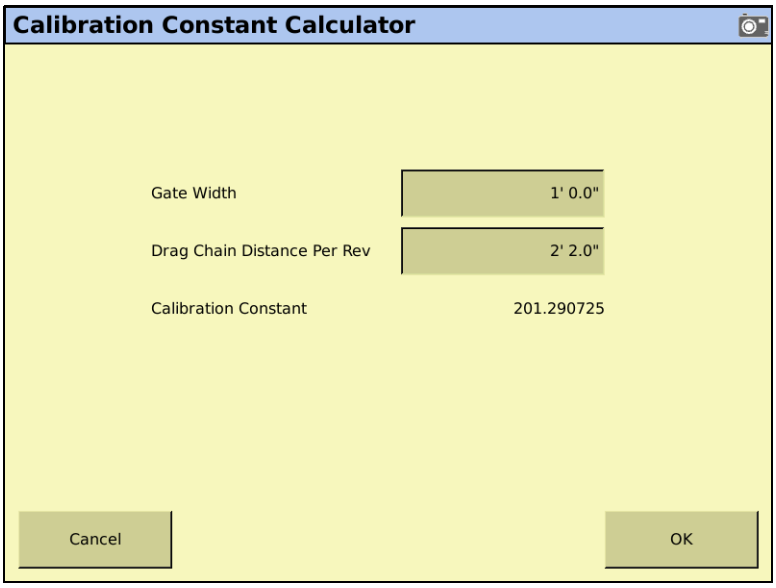


8. Enter the following values:
   - *Gate Height Setting*

Note – *If you entered a gate height measurement during setup, you must also enter a measurement here.*

   - *Shaft Encoder Constant*

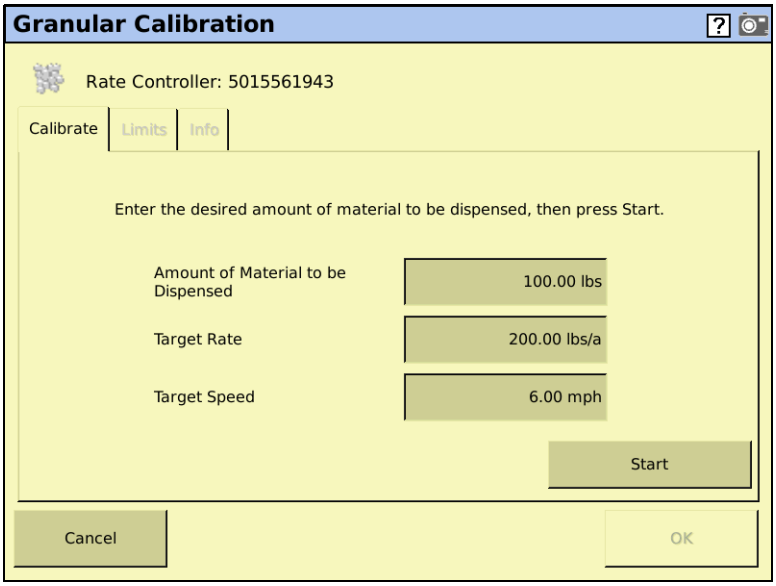
9. To calculate the calibration constant, tap **Calculate.** The following dialog appears.



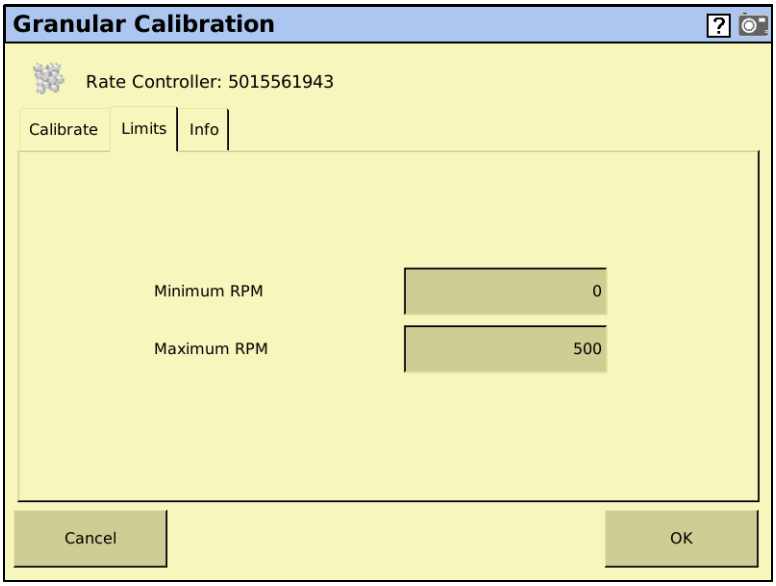
10. Enter the *Gate Width* and *Drag Chain Distance Per Rev*. The system calculates the Calibration Constant.
11. Tap **OK** to return to the *Granular Calibration* Screen.
12. Place a clean empty container under the spreader to capture the material dispensed during the calibration, and then tap **Calibrate**.

CAUTION – Moving parts during this operation. Ensure the implement is safe to operate.

13. The *Granular Calibration* screen appears:

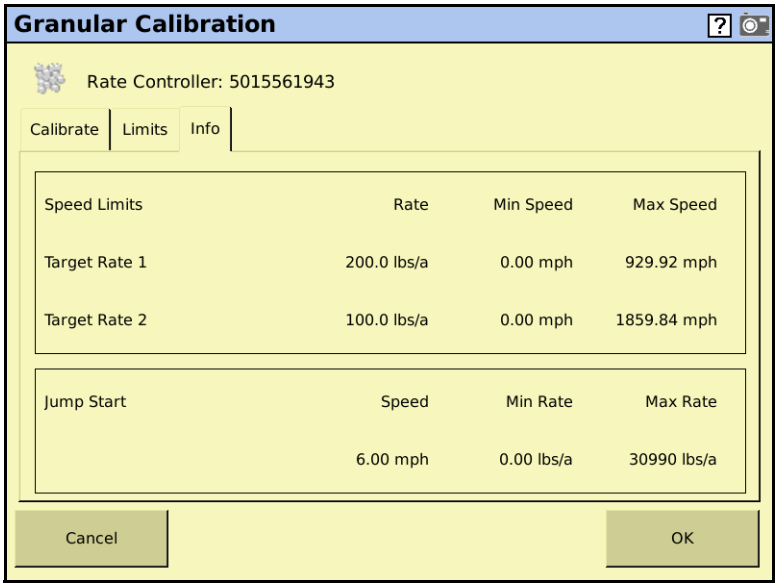


14. Enter the following values:
    - *Amount of Material to be Dispensed:* This is the amount dispensed during the calibration.
    - *Target Rate*
    - *Target Speed*
15. To begin the calibration, tap **Start**, and then follow the on-screen instructions.
16. Select the *Limits* tab:



17. Enter the following values:
    - *Minimum RPM*
    - *Maximum RPM*

18. Select the *Info* tab to view the system's operational limits (based on the RPM limits, target rates, and application width):



19. Tap **OK**.

Calibrating the implement lift switch

1. From the *Field-IQ Calibration* screen, select the Implement Lift option.
2. Raise the implement and then tap **Next**.
3. Lower the implement and then tap **Next**.
4. Tap **OK** to return to the Field-IQ *Calibration* screen.

Operating in the field

1. From the Home screen, tap  .
2. From the *Current Configurations* screen, configure the display/vehicle/ implement settings and then tap **OK**.
3. From the *Field Selection* screen, select the required client/farm/field/event settings and then tap **OK**.

Setting up the Field-IQ system for Anhydrous

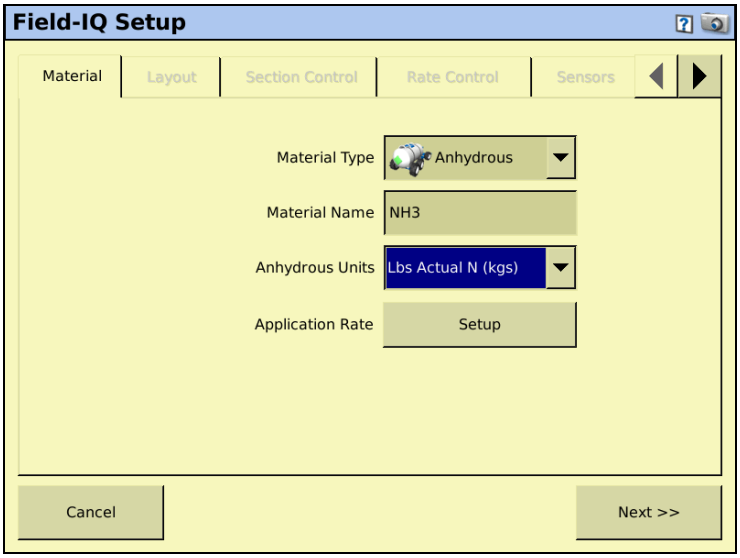
WARNING – When you tap the liquid flow calibration **Start** button, the machine will become operational. Take all necessary precautions to ensure user safety. Failure to do so may result in serious injury or death.

Make sure that you have set your implement to Tillage or Spraying, and that you have configured the implement, see Configuring the display, page 75. In the *Material Overview* screen, tap **New** to open the Field-IQ Setup Wizard. The Wizard contains the following seven tabs:

For information on this tab...	See...
Material	page 233
Layout	page 234
Section Control	page 236
Rate Control	page 238
Row Monitoring	page 241
Sensors	page 242
Operation	page 243

Material tab

Enter information about the material you want to set up.

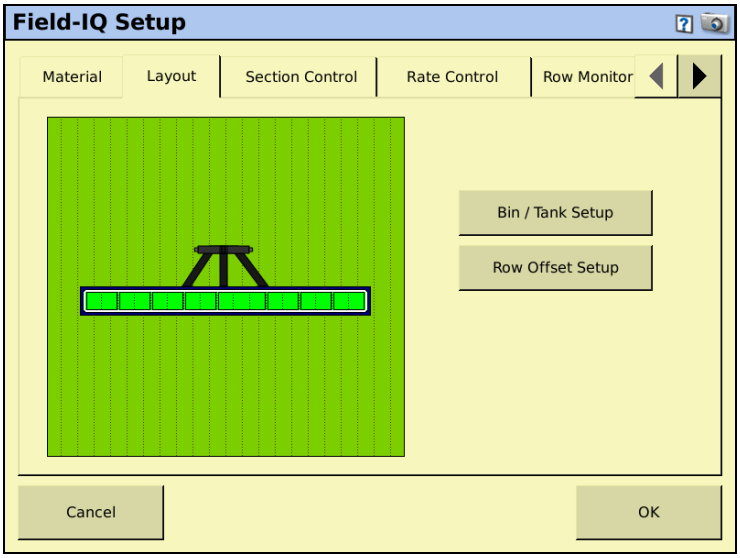


Setting	Description
Material Type	Select your Field-IQ application type: ***Note –*** *If spraying chemicals, use the liquid fertilizer setting.* • Row Crop Seed • Liquid • Granular Seed • Granular Fertilizer • Anhydrous
Material Name	Use the virtual keyboard to enter a name for the material.
Anydrous Units	Select the unit of measure: • Lbs actual N: Pounds (kg) of nitrogen per acre (hectare) • Lbs NH3: Pounds (kg) of anhydrous per acre (hectare)

Setting	Description
Application Rate	***Rates tab*** Adjust the following Rate settings: • Target Rate: This setting controls the volume that the implement supplies when the Rate switch is in position 1. • Target Rate 2: This setting controls the volume that the implement supplies when the Rate switch is in position 2. • Rate Increment: When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Manual Rate Increment: When the Rate switch is in the Manual position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box. • Minimum Rate: This setting is the minimum rate that will be applied. • Maximum Rate: This setting is the maximum rate that will be applied
	Units tab Adjust the following Unit settings: • Seeds Per Pound: Enter the number of seeds per pound of the current material. • Target Rate Units: Choose what units your target rate will apply. • Bushel Weight: Enter the bushel weight of the current material.

Layout tab

Enter information about the implement that will be used to apply the material.

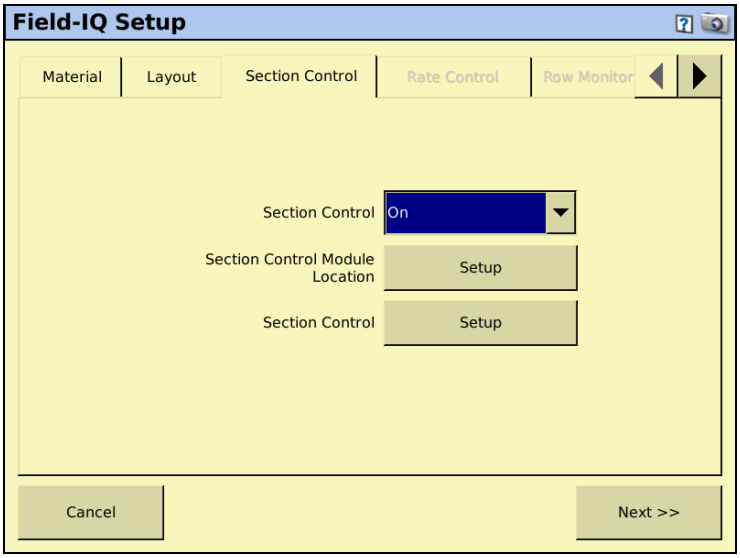


Setting	Description
Bin/Tank Setup	Allows the system to track how much material is left in the bin/tank, and provides a warning when the bin/tank needs to be refilled. Adjust the settings for: • Status: On: The system will track the bin/tank level and provide warnings. Off: The system will not track the bin/tank level or provide warnings. • Capacity Units: Select Default Units or Bushels. Default units will vary according to the type of material that is being applied. • Bin Capacity: The amount the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* • Current Volume: Current volume of the product in the tank. • Partial Refill: The amount of material that will be added to the bin/tank during a partial refill. • Warning Level: A warning will appear on your screen when your bin/tank reaches a set threshold. • Refill Tank/Bin: Refills the tank/bin to capacity. • Partial Refill Tank/Bin: Refills the tank/bin to the amount specified in the *Partial Refill* field.

Setting	Description
Row Offset Setup	Row Offset Setup provides additional tuning by detailing where the material will be applied in relation to the vehicle. Increase coverage accuracy by selecting one or two offsets. Row offsets are measured from the Application Offset that is entered in the Measurements tab of the Implement Configuration wizard. See Implement Configuration, Measurements, page 165. • Number of row offsets: Use 1 row offset when coverage is applied at a single location. Use two row offsets when planting singulated seed with staggered implements. • Row Offset (1 row offset): Enter the distance between the Application Offset and the row. • Rear Row Offset (2 row offset): Enter the distance between the Application Offset and the rear row. • Front Row Offset (2 row offset): Enter the distance between the Application Offset and the front row.

Section Control tab

Adjust the section control settings.

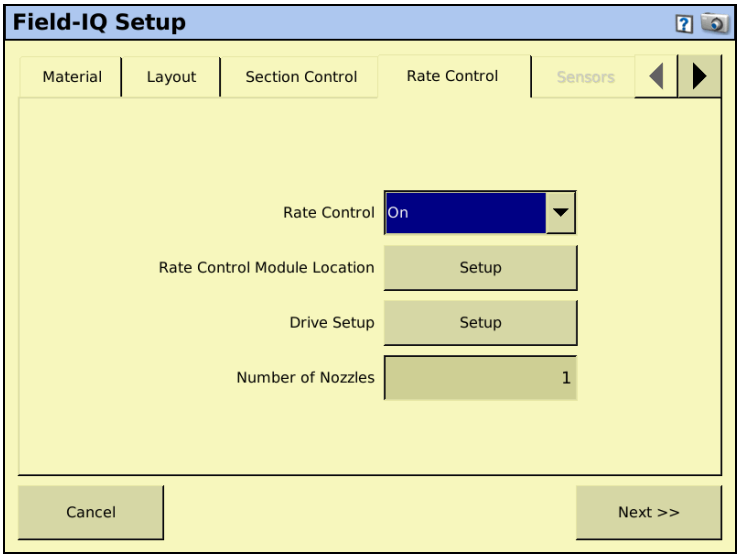


Setting	Description
Section Control	On: Enable section control for the current material. Off: Disable section control for the current material. Rate as Section: When a rate controller turns on or off, the section turns on or off. Link to Material: See Linking Materials, page 230.

Setting	Description
Section Control Module Setup	Tap **Setup** to configure the section control module(s), their location on the implement, and the number of sections they will control. Assign the Field-IQ module to the correct location to ensure it controls the correct section. • Number of Modules: Enter the number of Field-IQ section control modules you will use. • Module: Select the module number that corresponds to each section. • Number of Sections: Assign the number of sections that each module will control. • Section Grouping: Assign the rows that are in each section. • Advanced Wire Assignment: Every section is controlled by a specific wire on each Field-IQ module. Use this setting to specify which module each section is wired to.
Section Control	Tap **Setup** to adjust settings for each section control module. • Section Control Type: Select the type of section control for each module. • Off When Stopped: When set to Yes the control valve will close when ground speed reaches 0 with the master switch position in On. When set to No the control valve will hold its last position when the master switch is shut off and ground speed reaches 0—if the vehicle is a clutch-operated planter, set this option to *No* so that you can continue planting when the vehicle is stopped. Otherwise, select *Yes*. • On Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the On Latency value to compensate the delay, and the system will turn on in advance. • Off Latency: By default, this is set to 0.0 seconds. Use this setting unless you are experiencing a long response time from your clutch or valve (this can happen on larger systems). In this case, increase the Off Latency value to compensate for the delay, and the sytem will turn off after the set number of seconds. • Start Overlap: Enter the distance of intentional swath overlap when entering a previously applied area. The higher the number, the greater the overlapped area. • End Overlap: Enter the distance of intentional swath overlap when exiting a previously applied area. The higher the number, the greater the overlapped area. • Coverage Switching Overlap: Enter the percentage of the section width for intentional swath overlap. The higher the number, the greater the overlapped area before the section is turned off. • Boundary Switching Overlap: Enter the percentage of the section width for intentional overlap of a boundary. The higher the number, the greater the overlapped area into the boundary area.

Rate Control tab

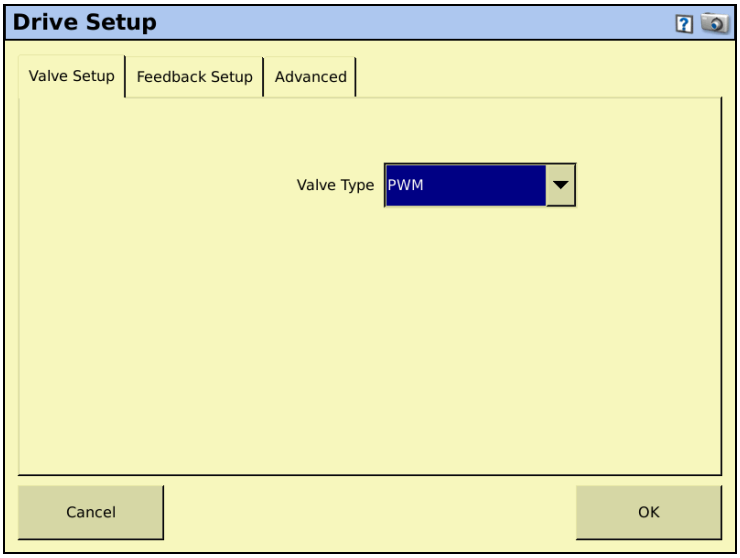
Adjust the rate control settings.



Setting	Description
Rate Control	On: The system sets the target rate. Off: Section switching only
Rate Control Module Location	Tap **Setup** to configure the rate control module(s), their location on the implement, and the width they will control.
Drive Setup	When you tap **Drive Setup**, a screen appears with the following tabs: • Valve Setup • Feedback Setup • Advanced The tabs are explained in more detail on the following pages.
Number of Nozzles	Enter the number of spray nozzles on the sprayer.

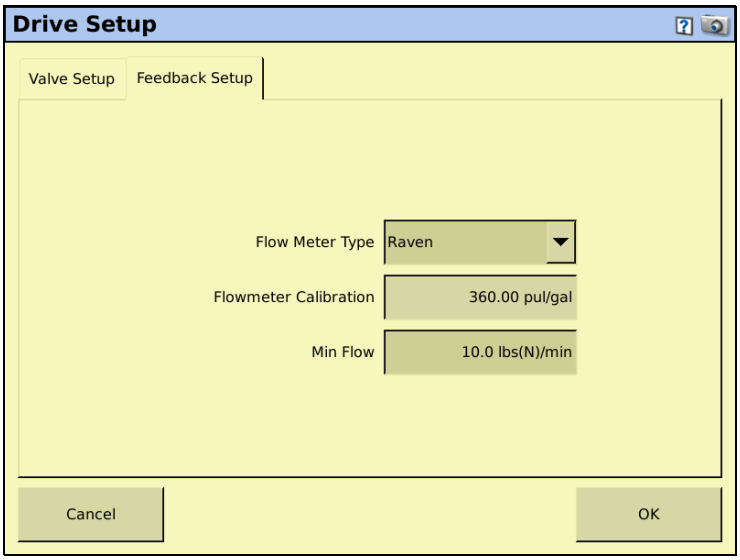
Drive Setup

Valve Setup tab



Setting	Description
Valve Type	Servo: 2-wire standard servo valve Fast Servo: 4-wire servo valve PWM: 2-wire PWM valve (commonly used to control hydraulic flow to the pump)

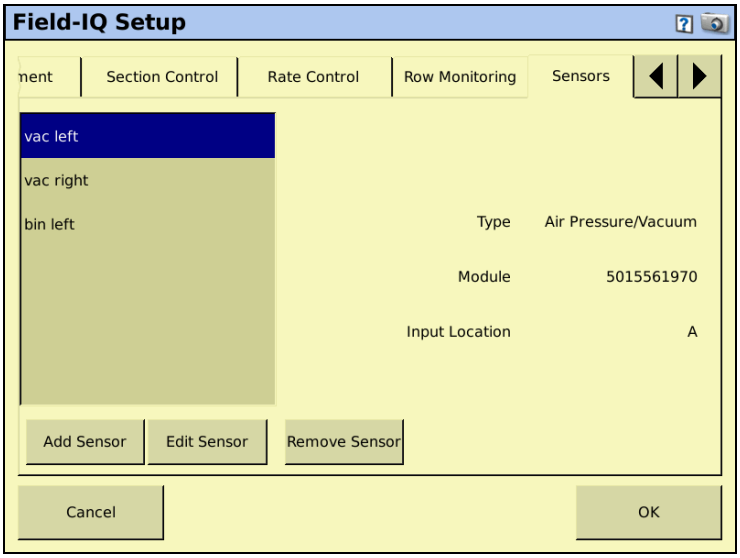
Feedback Setup tab



Setting	Description
Flow Meter Type	Select the type of flow meter that is connected.
Flowmeter Calibration	Enter the number from the flow meter tag.
Min Flow	Enter the required minimum flow rate for the system. Use this setting to keep the control valve and flow meter above the minimum operating level.

Sensors tab

Add or edit sensor settings.

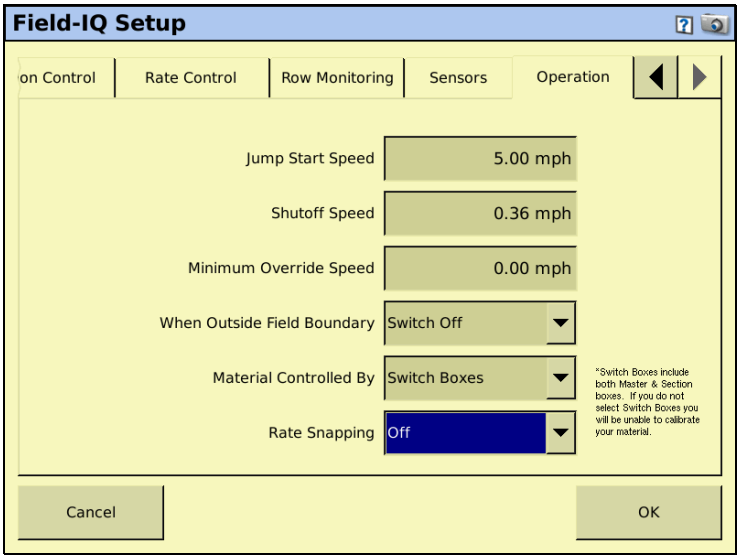


Setting	Description
Add Sensor	Add a new sensor.
Edit Sensor	Edit or view the settings for an existing sensor.
Remove Sensor	Delete an existing sensor.

When adding or editing a sensor, enter the following information:

Setting	Description
Sensor Type	Select from: • Air pressure/vacuum • Liquid pressure • NH3 pressure • Bin level • RPM • Gate Height
Name	Use the virtual keyboard to enter a name for the sensor.
Sensor Setup	Field-IQ module: Select the Field-IQ module that is controlling this sensor. Input location: Specify which wire is controlling the sensor.

Operation tab



Setting	
Jump Start Speed	This setting controls the speed to be used when the Field-IQ master switchbox Master switch is put in the jump start position. This manual override option can be used to operate the system when the vehicle is stationary. Jump start is also used when GPS has become unavailable.
Shutoff Speed	This setting controls when to shut the system down if the implement drops below the specified speed.
Minimum Override Speed	This setting maintains the application rate when the implement's actual speed drops below the value entered. It is used to ensure consistent material flow during slow speeds.
When Outside Field Boundary	Switch off: The system will not apply outside the boundary area. Operate: The system will apply outside the boundary area.
Material Controlled By	Enabled: The material is tied to the Master Switch Box and cannot be controlled individually. Disabled: The Material is not tied to the Master Switch box and is controlled by virtual buttons on the Run screen.
Rate Snapping	Enabled: Shows the applied rate the same as the target rate, if the applied rate is within 10% of the target rate. Disabled: Shows the actual applied value.

Material Setup Complete screen

When you have completed setting up a new material, the *Material Setup Complete* screen appears. You can select:

- **Add another material**. You are returned to the start of the *Field-IQ Setup Wizard*.
- **Finish Setup**. You are returned to the *Material Overview* screen.

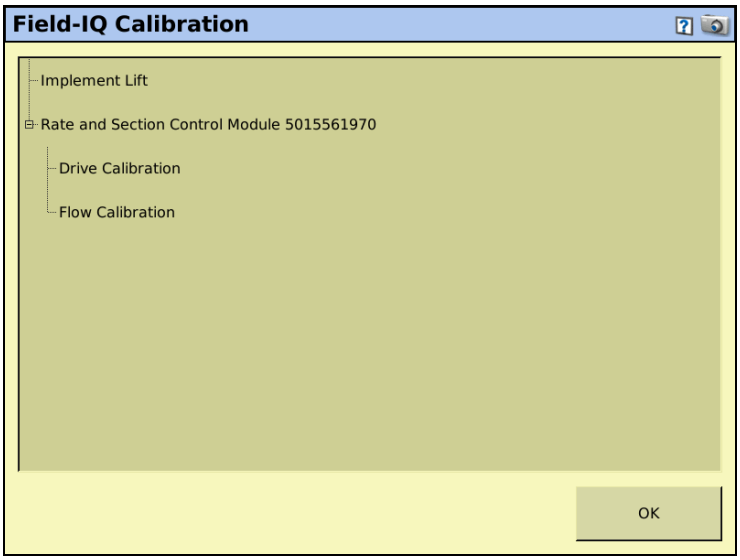
Calibrating the modules

Calibrate the modules to ensure that your system performs at the level you require.

The Field-IQ *Calibrate* option only appears on the *Configuration* screen if you have at least one Field-IQ Rawson control module or Rate control module set up to control the rate.

1. From the *Configuration* screen, select the Field-IQ plugin and then tap **Calibrate**.
2. From the *Field-IQ Calibration* screen, select the operation under the Module that you would like to calibrate. The message Not calibrated appears at the end of the modules that need calibration.

Note – *If you have an implement lift switch, calibrate it first. See* *Calibrating the implement lift switch, page 248**.*



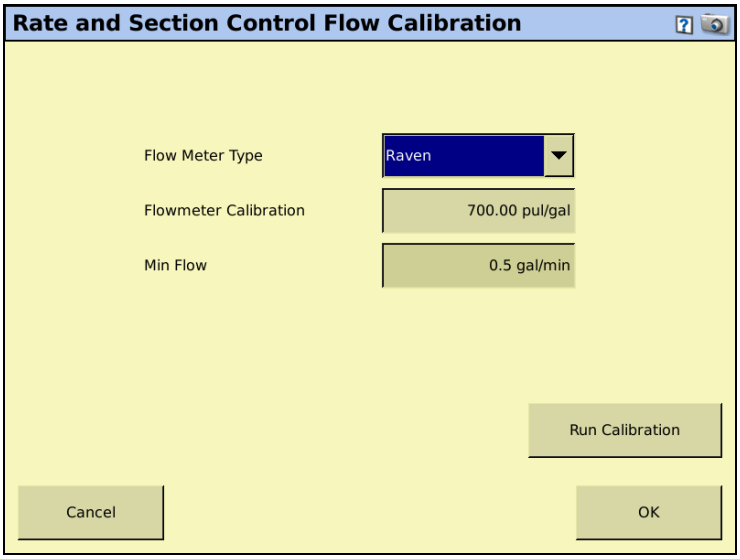
3. Select *Drive Calibration* and then tap **OK**. The *Drive Calibration* screen appears.

   The *Drive Calibration* screen has four tabs:

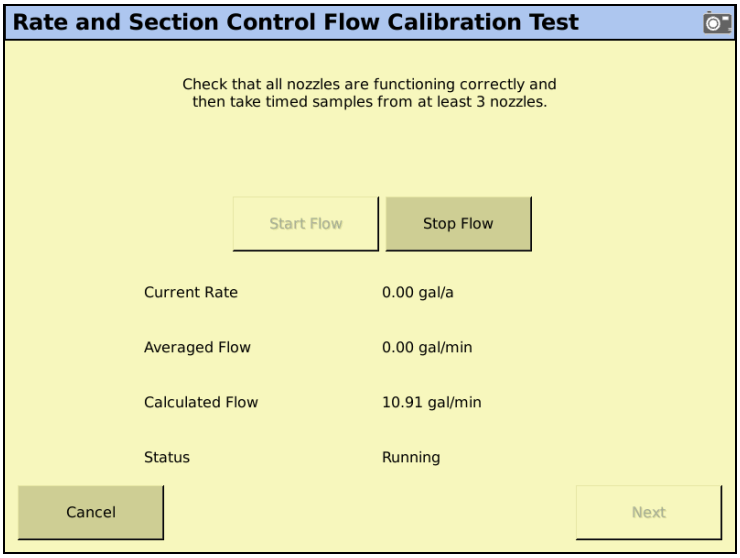
Tab	Description
Drive Limits	Enter the minimum and maximum flow values.
Auto-Tuning	⚠ **CAUTION –** Moving parts during this operation. Ensure the implement is safe to operate. Follow the on-screen instructions to auto tune the system. ***Note –*** *Do not perform the auto-tuning function if you have loaded a preset configuration file. Use the predefined configuration settings appropriate for your vehicle.*
Drive Settings	Turn the master switch on and vary the rates. Adjust values if needed.
Info	Shows the results and drive limits of your calibration.

4. Select *Flow Calibration* and then tap **OK**. The *Flow Calibration* screen appears.

5. In the *Rate and Section Control Flow Calibration* screen, enter the *Flow Meter* type, the *Flow Meter Calibration*, and the *Minimum Flow*:



6. Tap **Run Calibration** and then follow the on-screen instructions:



Calibrating the implement lift switch

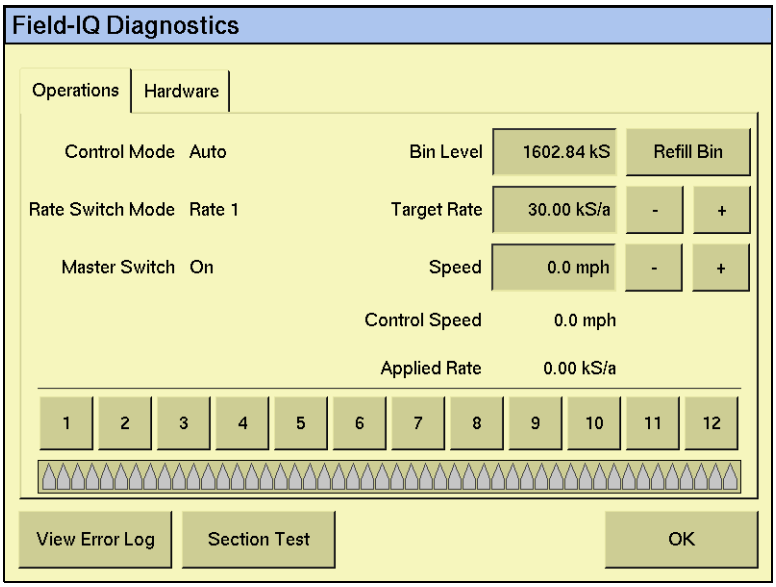
1. From the *Field-IQ Calibration* screen, select the Implement Lift option.
2. Raise the implement and then tap **Next**.
3. Lower the implement and then tap **Next**.
4. Tap **OK** to return to the Field-IQ *Calibration* screen.

Operating in the field

1. From the Home screen, tap  .
2. From the *Current Configurations* screen, configure the display/vehicle/ implement settings and then tap **OK**.
3. From the *Field Selection* screen, select the required client/farm/field/event settings and then tap **OK**.

Using the Diagnostics tab

From the *Configuration* screen, select the Field-IQ plugin and then tap **Diagnostics**:



The *Operations* tab displays the current status of:

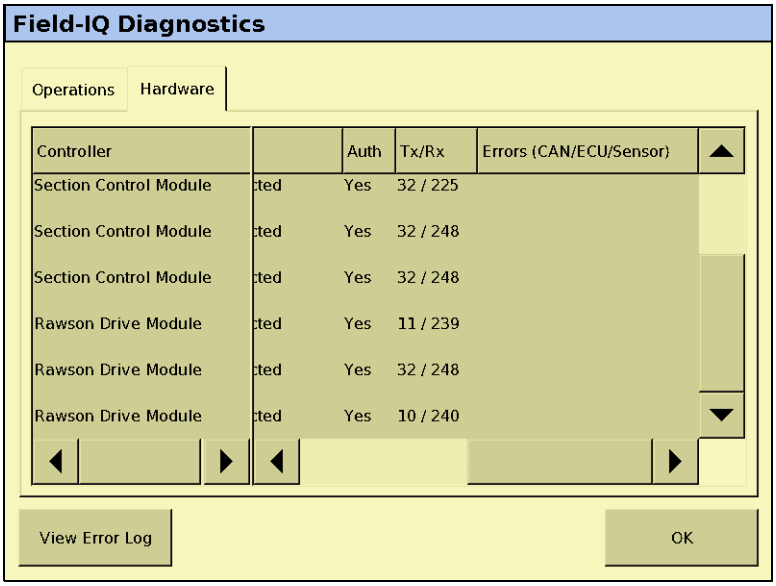
- Control Mode (Auto or Manual)
- Rate Switch Mode (Manual, Rate 1, or Rate 2)
- Master Switch (Off, On, or Jump Start)

This screen also enables you to manually adjust:

- Bin Level: Enter a new value or select Refill Tank.

- Target Rate: Decrease or increase.
- Speed: Decrease or increase.
- Switches: If you are using the optional Field-IQ individual section switch box, this screen indicates which switches have been assigned to each section. To test this, flip each switch in the section switch box. The section it is assigned to appears gray.
- **View Error Log:** Shows all the errors that have occurred since the error log was cleared.
- **Section Test**: The system begins a sequence of engaging each section and groups of sections.

The *Hardware* tab displays the connected Field-IQ CAN modules and the following attributes:



- Serial number
- Position on the implement
- Firmware version
- Status of CAN connection
- Tx/Rx number of packets
- Errors associated with the module