GETTING STARTED GUIDE

Trimble® Field-IQ™ for Air Seeders on the FmX® Integrated Display

Version 7.2
Revision A
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Trimble

Agriculture Business Area

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Release Notice

This is the May release (Revision A) of Field-IQ for Air Seeders on the FmX Integrated Display. It applies to version 7.2 of the FmX integrated display firmware.

Product Warranty Information

For applicable product warranty information, please refer to the Warranty Card included with this Trimble product, or consult your Trimble reseller.

Contents

CHAPTER 1

Getting Started

In this chapter:

This Getting Started Guide gives a high-level explanation of how to use the Trimble® Field-IQ™ system running on the FmX 7.2 Integrated Display for air seeders.

Installation

For information on installing the Field-IQ crop input control system on your air seeder, refer to the following Field-IQ Platform Installation Instructions:

- *Field-IQ System - Air Seeder - Electric over Hydraulic and PWM - Installation Instructions*
- *Field-IQ System - Air Seeder - Linear Actuator Systems - Installation Instructions*

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

Configuration

1. Set up the implement (including Lift Sensor, if applicable), see Setting up the implement, page 5
2. Set up material, see Setting up materials, page 8.
3. Assign a material to a location (such as a bin or tank), see Assigning a material to a location, page 12.
4. Set up section control for the location, see Setting up section control for the location, page 14.
5. Set up the rate control drive, see Setting up the rate control drive, page 16
6. Add sensors for the location, see Adding sensors for the location, page 20
7. Repeat Step 4 through Step 6 for all locations.

Setting up the implement

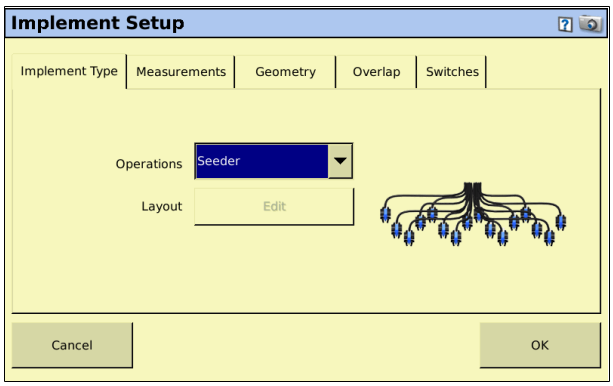
Note – *These instructions are a summary of the most important setup items for Air Seeders. For complete setup instructions, please refer to the latest version of theFmX Integrated Display User Guide.*

1. On the Home screen of the FmX display, tap the configuration button.

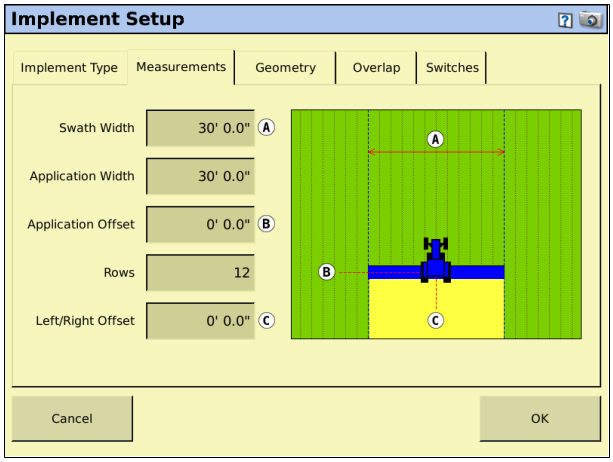
2 On the *Configuration* screen, select *Implement* and then tap **Setup**.

3. From the *Operations* drop-down list, select *Seeder*.

4. Select the *Measurements* tab.

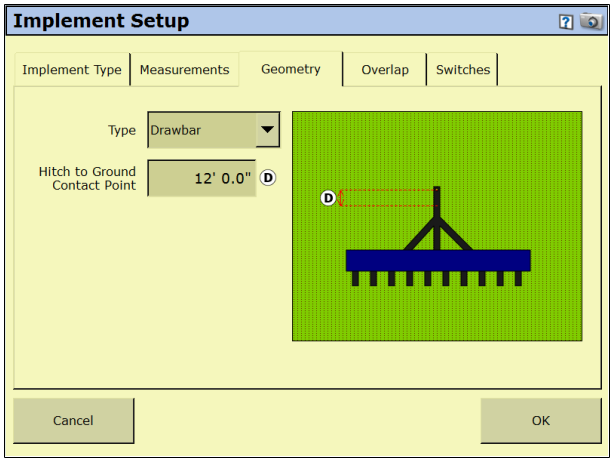


5. Enter the required measurements. See the table below.

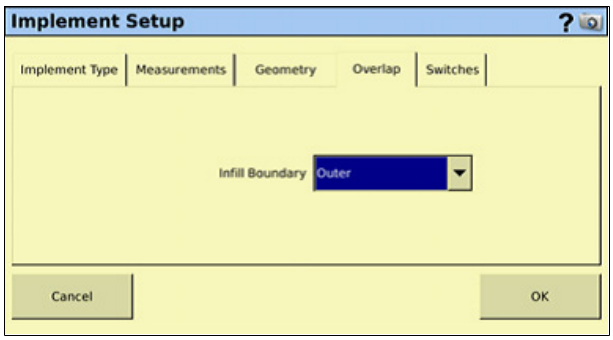


Setting	Description
Swath Width	Set the distance between guidance passes.
Application Width	Enter the applied width of the tool or boom. This measurement sets the width of the coverage logging and mapping.
Application Offset	Measure from the fixed axle of the vehicle to the point on the implement where coverage logging will be mapped. The fixed axle depends on the vehicle type: • Front steering tractors and self-propelled sprayers: Rear axle • Harvesters and 4x4 tractors: Front axle • Tracked tractor: Center of tracks
Rows	Enter the number of rows that are covered by the implement.
Left/Right Offset	Measured from the center of the vehicle to the center of the implement or header. This measurement adjusts the tractor path so that an offset implement is centered on the guidance line.

6. Select the *Geometry* tab and then do the following:
   - From the *Type* drop-down list, select *Drawbar*.
   - Enter the *Hitch to Ground Point*. Measure from the tractor hitch pin to the soil engagement point that the implement rotates about.



7. Select the *Overlap* tab and then select the *Infill Boundary* from the drop-down list.

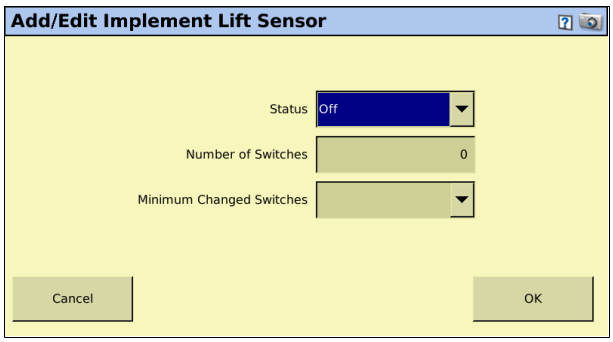


The display uses the Infill Boundary when you are working in the infill of a headland. The inner boundary is around the infill area and an outer boundary is around the headland.

- Select **Inner** to shut off sections when the implement reaches the inner boundary.
- Select **Outer** to shut off sections when the implement reaches the outer boundary.

8. If you are using an implement lift switch:
   - Select the *Switches* tab.
   - Tap **Setup**.
   - Set the switch options. See the table below for details.
   - Tap **OK** twice to return to the *Configuration* screen.

   Note – *To calibrate the lift switch, see* *Calibration, page 24*.

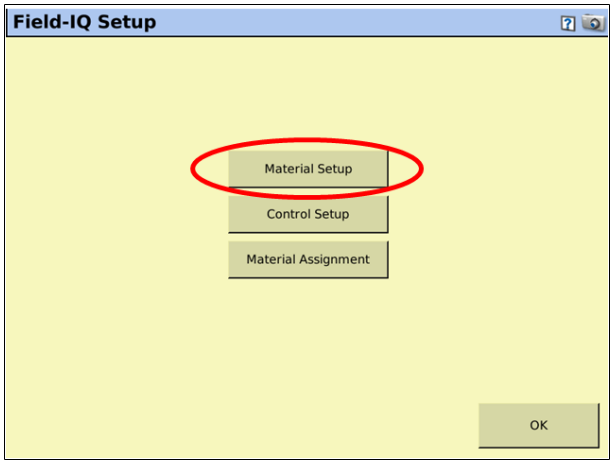


Setting	Description
Status	Off: No implement switches are attached to the Field-IQ system. On: One or more implement switches are attached.
Number of Switches	Select the number of Implement Switches that are attached to the Field-IQ system. The maximum is 3.
Minimum Changed Switches	Enter the number of implement switches the system must recognize to determine if the implement is lifted. For example, if the total number of switches is 2, and the *Minimum Changed Switches* is 2, both switches have to be raised before the display determines that the implement is in the raised position.

Setting up materials

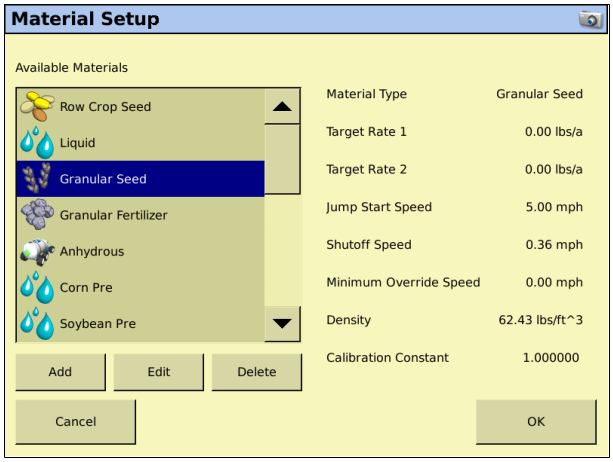
1. On the *Configuration* screen, select *Field-IQ* and then tap **Setup**.

2. In the *Field-IQ Setup* screen, tap **Material Setup**.



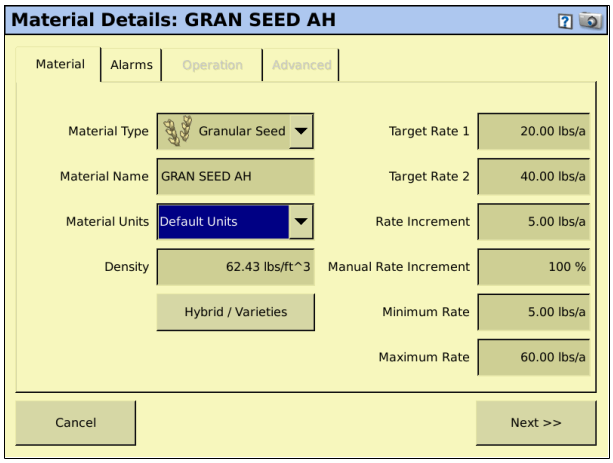
3. Do one of the following:
   - Tap **Add** to define a new material.
   - Select an existing material and then tap **Edit**.

   Note – *If you will be using the same material in different locations (such as bins) and the calibration is different for each location, create a different material for each location. Use a material name that represents the location (for example, Wheat Front Bin 1, Wheat Rear Bin 2) so you know which one to select when setting up the location.*



4. On the *Material* tab, enter the appropriate values. See the table below.

   Note – *When you edit a Material Name after linking a material to a location, the material is unassigned from the control. You must repeat the steps under* *Assigning a material to a location, page 12* *to assign the material to the location again.*

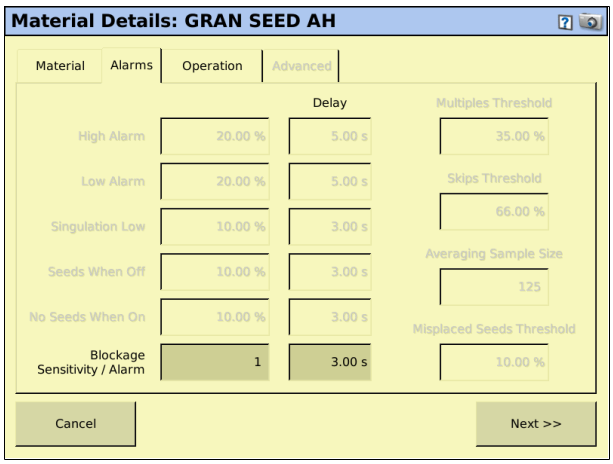


Setting	Description
Material Type	Select the material type.
Material Name	Use the virtual keyboard to enter a name for the material.
Material Units	Select the units to use with the selected material.
Density	Enter the density of the selected material, or the number of seeds per pound.
Target Rate 1	This 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.

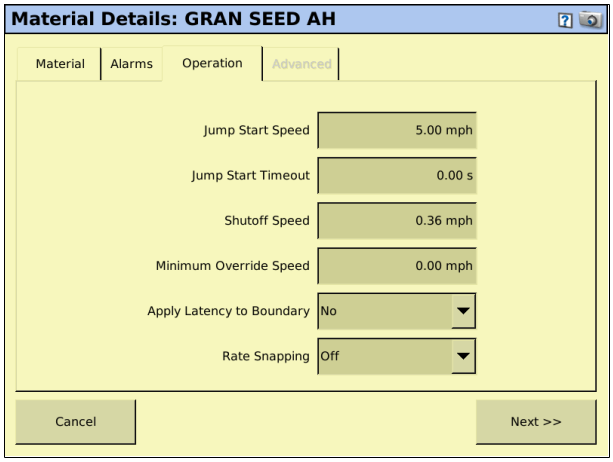
Setting	Description
Rate Increment	When the Rate switch is in the Rate 1 or Rate 2 position, the current application rate increases or decreases by this amount each time you press the Rate adjustment (increment/decrement) switch on your master switch box.
Manual Rate Increment	When the Rate switch is in the Manual position, this controls the speed at which the valve increases or decreases each time you press the Rate adjustment (increment/decrement) switch on your master switch box. ***Note –*** *You can increase the performance of your drive in manual mode by increasing this value. A setting of 1000% is common for air seeders.*
Minimum Rate	This setting is the minimum rate that will be applied.
Maximum Rate	This setting is the maximum rate that will be applied.

5. Tap **Next**. On the *Alarms* tab, set the *Blockage Sensitivity / Alarm* and *Delay*.

   When the sensors detect less than this amount of material for the number of seconds (under *Delay*), the alarm is triggered.



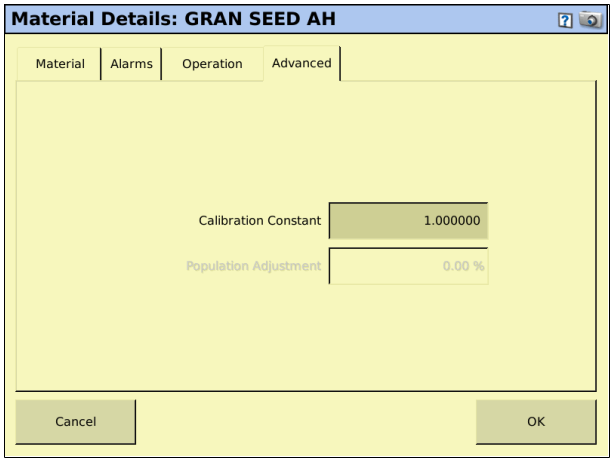
6. Tap **Next**. On the *Operation* tab, set the appropriate values. See the table below.



Setting	Description
Jump Start Speed	This is the speed to be used when the Field-IQ master switch box Master switch is in the jump start position. This option can be used to operate the system when the vehicle is stationary, or when GPS has become unavailable.
Jump Start Timeout	This is a Timeout setting for the Jump Start Speed, which allows you to run the jump start for a specified amount of time. ***Note –*** *Auto control resumes if Jump Start Speed is exceeded by Ground Speed.*
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.
Apply Latency to Boundary	This setting applies to fields that have a boundary and other exclusion zones (non-productive or previously covered areas). • Yes: The system starts when needed to begin applying immediately when crossing a boundary and entering a work area. The system stops when needed to stop applying immediately when crossing a boundary and leaving work area. • No: The system starts when the boundary is reached and any mechanical delay could leave a gap between the boundary and where the product is applied. When GPS accuracy is low, this is the preferred selection.

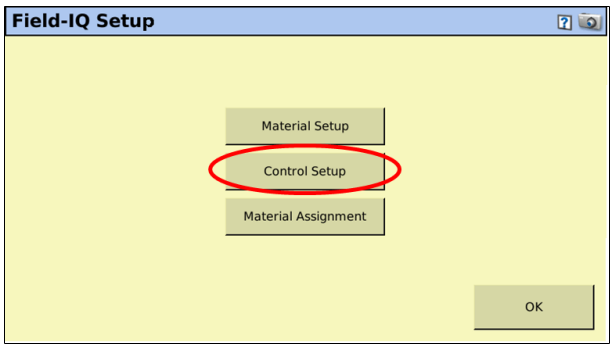
Setting	Description
Rate Snapping	This setting is used to smooth out the rate fluctuation seen on the screen. If you are within the allowable error, you will see the applied rate just show your target rate.

7. Tap **Next**. On the *Advanced* tab, review the *Calibration Constant*.
   - The *Calibration Constant* adjusts material flow so that the actual applied rate is as close to the target rate as possible.
   - To start, set the value to 1.00 for normal to large seeds or 0.1 for small seeds. See Calibration, page 24.
8. Tap **OK**.

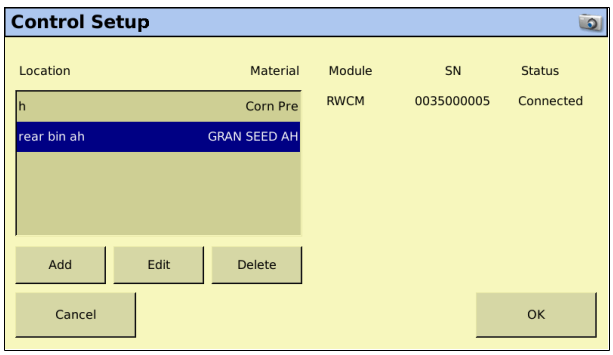


Assigning a material to a location

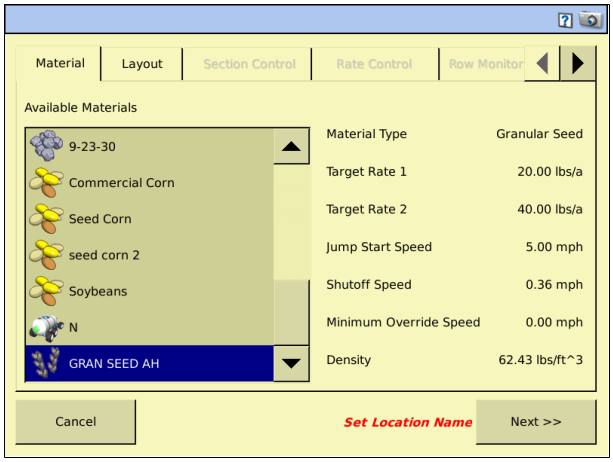
1. On the *Field-IQ Setup* screen, tap **Control Setup**.



2. Tap **Add** to create a Control.

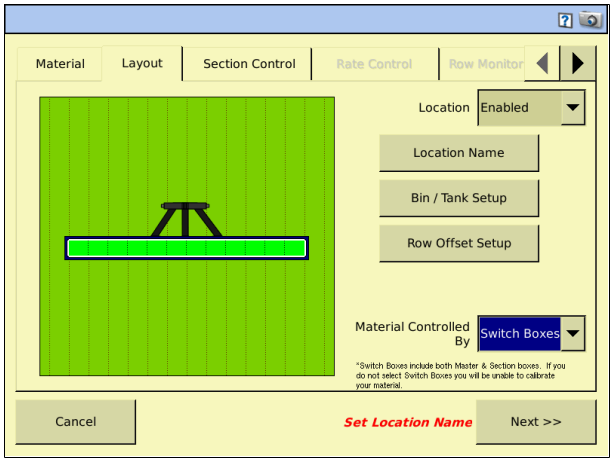


3. On the *Material* tab, select the Material you set up in the previous step from the *Available Materials* list.



4. Tap **Next** and then tap **Location Name**. Enter a *Location Name* (such as Rear Bin).

5. Tap **Bin/Tank Setup**. Configure a virtual tank to track how much material is in the bin/tank. See the table below.



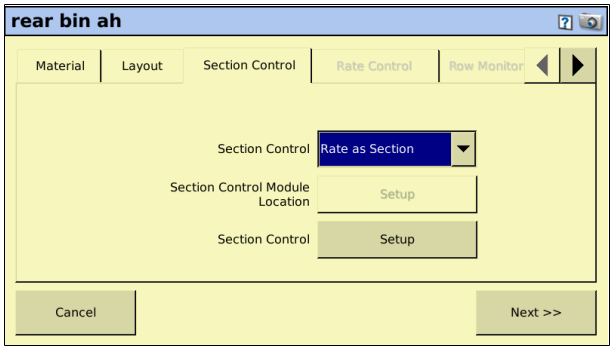
Setting	Description
Status	On: The system tracks the bin/tank level and provide warnings when the bin/tank needs to be refilled. Off: The system does not track the bin/tank level.
Capacity Units	Select *Default Units* or *Bushels*. Default units vary based on the type of material.
Bin Capacity	Enter the amount that the tank/bin holds when full. ***Note –*** *Markings on tank/bin may not be accurate.* ***Note –*** *you must adjust bin capacity manually adjusted for different material types.*

Setting	Description
Current Volume	Enter the current amount of material in the tank.
Partial Refill	Enter the amount of material that will be added to the bin/tank during a partial refill.
Warning Level	A warning appears on your screen when your bin/tank reaches this level.
Refill Tank/Bin	Update the Current Volume to show that the tank/bin has been refilled to capacity.
Partial Refill Tank/Bin	Add to the amount specified in the *Partial Refill* field to the *Current Volume*.

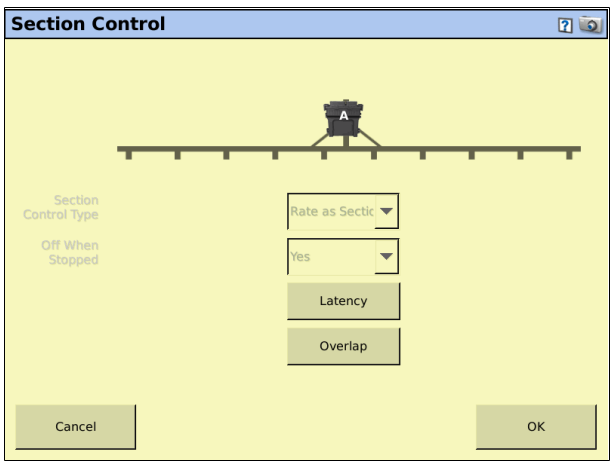
Setting up section control for the location

1. Tap **Next**. On the *Section Control* tab, do the following:
   - From the *Section Control* drop-down list, select *Rate as Section*.
   - Tap **Setup**.

   Note – *For separate Field-IQ Section Control configurations, refer to the FmX Integrated Display User Guide.*



2. If your clutch or valve takes a long time to start or stop placing seed on the ground, tap **Latency**. Set the following options:
   - *On Latency*: Enter the length of time from when the command is given to start dropping seed and when the seed is actually placed in the ground.
   - *Off Latency*: Enter the length of time from when the command is given to stop to when the seeds stop falling.

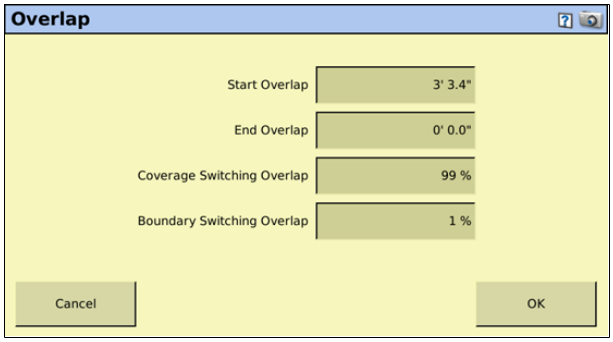


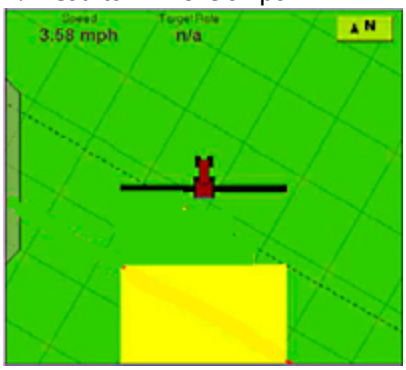
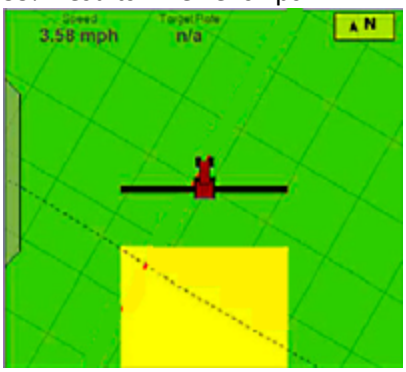
Latency causes the display to send commands early to ensure proper coverage on the field.

To determine the correct latency values, see Testing the system, page 38.

3. Tap **Overlap** to set the distance to allow sections to overlap before they turn on or off. See the tables below.

   More overlap results in fewer skips. Skips are the areas where material is not applied.

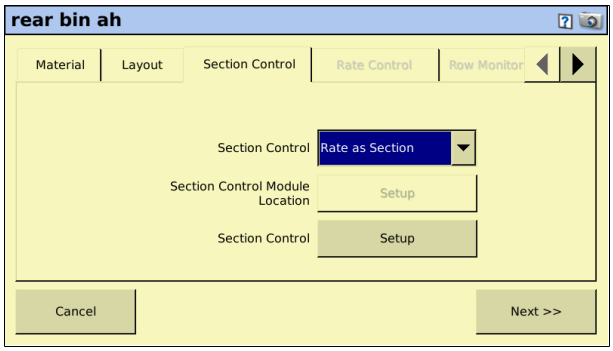


Low Overlap ...	High Overlap ...
1% results in more skips: 	99% results in fewer skips: 

Setting	Description
Start Overlap	Enter the overlap distance to use when starting coverage. When you are in a previously covered area driving toward an non-covered area, the system will start turning sections on at this distance before the non-covered area.
End Overlap	Enter the overlap distance to use when stopping coverage. When you are applying material and driving toward a previously covered area, the system will keep sections on until the sections are this far into the previously covered area.
Coverage Switching Overlap	Enter the percentage of a section's width that must be in a previously covered area before the system switches the section off. The higher the number, the greater the overlapped area before the section is turned off.

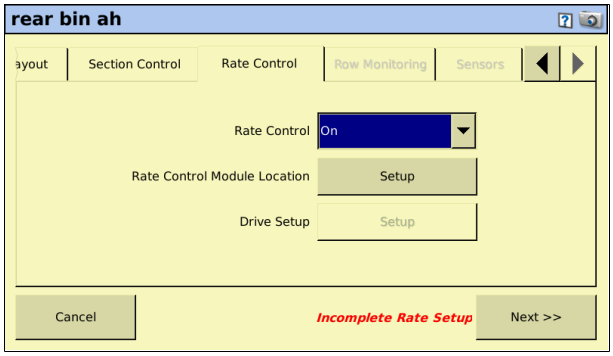
Setting	Description
Boundary Switching Overlap	Enter the percentage of a section's width that must be past a boundary before the system switches the section off. The higher the number, the greater the overlapped area before the section is turned off.

4. Tap **OK** twice.. On the *Section Control* tab, tap **Next**.

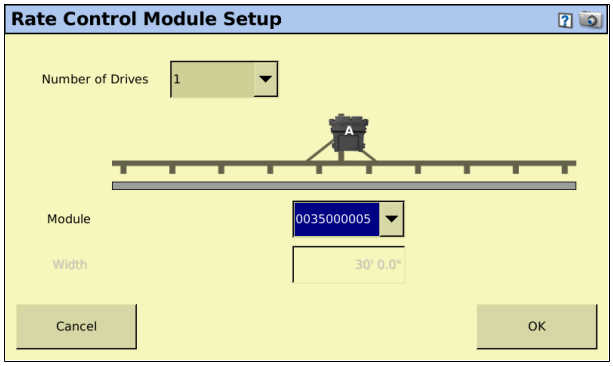


Setting up the rate control drive

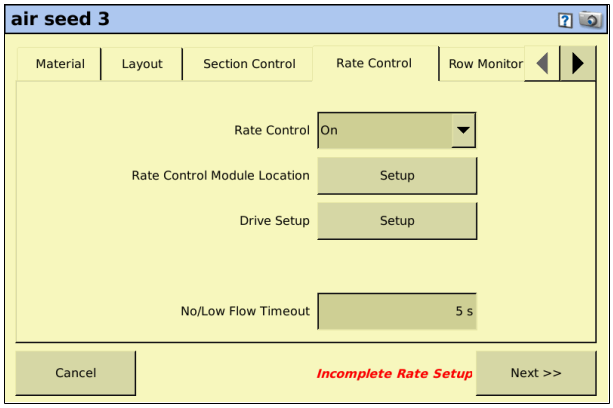
1. On the *Rate Control* tab, do the following:
   - From the *Rate Control* drop-down list, select *On*.
   - Tap **Setup** next to *Rate Control Module Location*.



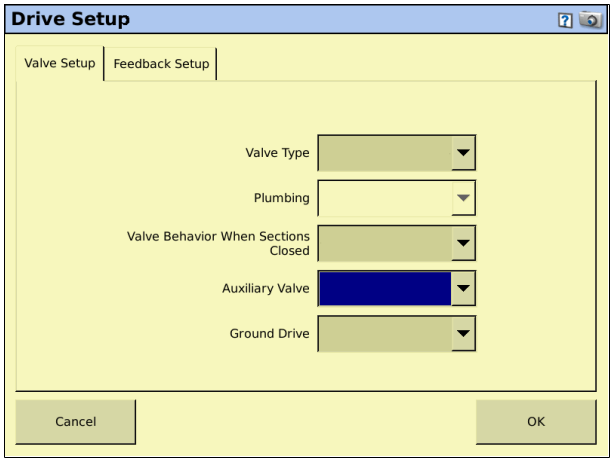
2. On the *Rate Control Module Setup* screen, do the following:
   - From the *Number of Drives* drop-down list, select *1*.
   - From the *Module* drop-down list, select the serial number of the Rate Control Module used at this location.
   - Tap **OK**.



3. On the *Rate Control* tab, tap **Setup** next to *Drive Setup*.



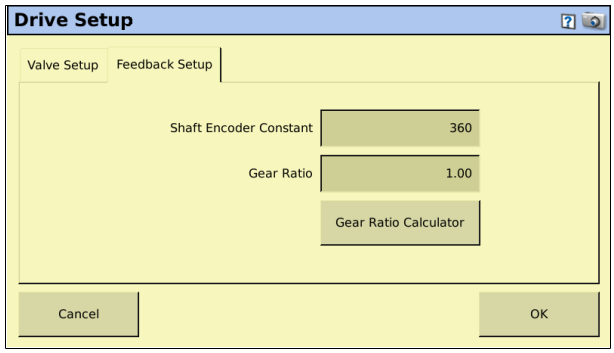
4. On the *Valve Setup* tab for *Drive Setup*, do the following:
   - Enter the settings for the specific air seeder. See the table below for some common air seeder settings.
   - When finished, tap **Next**.



Air Seeder	Settings				
	Valve type	**Plumbing**	**Valve behavior when closed**	**Auxiliary valve**	**Ground drive**
Ausplow	PWM	Inline	Lock in last position	Disabled	Disabled
Bourgault	Linear actuator	Inline	Lock in last position	Material Clutch +	Enabled when High
Flexicoil	Electric over hydraulic	Inline	Lock in last position	Disabled	Disabled
Gason	PWM	Inline	Lock in last position	Disabled	Disabled
Harwood Bagshaw	PWM	Inline	Lock in last position	Disabled	Disabled
John Deere	Linear actuator	Inline	Lock in last position	Material Clutch +	Enabled when High

Air Seeder	Settings				
	Valve type	Plumbing	Valve behavior when closed	Auxiliary valve	Ground drive
Morris	PWM	Inline	Lock in last position	Disabled	Disabled
Simplicity	Linear actuator	Inline	Lock in last position	Material Clutch +	Enabled when High

5. On the *Feedback Setup* tab, do the following:
   - Enter the settings for the specific air seeder. See the table below.
   - When finished, tap **OK**.



Air Seeder	Settings	
	Shaft Encoder Constant - Pulses per revolution	**Gear Ratio** - Ratio of the rate sensor to the seed meter shaft (number of revolutions that the rate sensor turns for each revolution of the seed meter)
Ausplow	30	1:1
Bourgault	13	1:1
Flexicoil	360	1:1
Gason	360	1:1
Harwood Bagshaw	360	1:1
John Deere		1:1
Morris	360	1:1
Simplicity	360	1:1

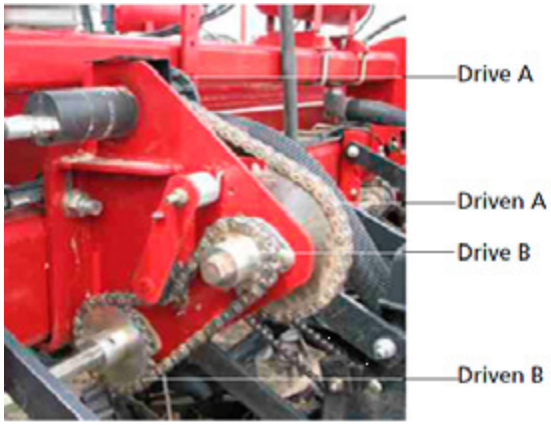
Note – *If the feedback sensor is located on the seed monitoring shaft, then the gear ratio will always be 1:1.*

If your air seeder model is not in the above table, use the *Gear Ratio Calculator* to determine your gear ratio.

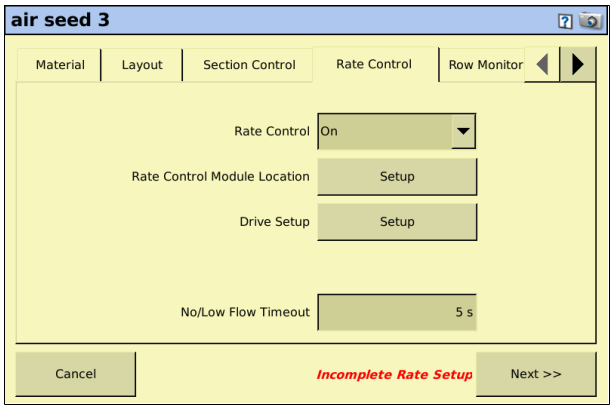
If the equipment has multiple gear sets, combine the ratios. Use the calculator, or use the following equation for known gear ratios:

$$\frac{\text{Driven A}}{\text{Drive A}} \times \frac{\text{Driven B}}{\text{Drive B}} = \text{Total gear ratio}$$

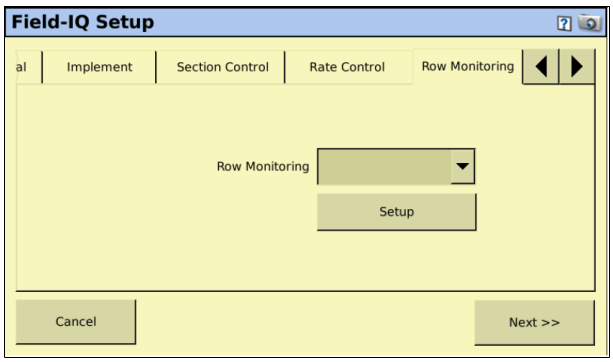
- *Drive* is the gear that turns the chain or gears.
- *Driven* is the gear that is moved by the drive gear, which outputs material to the planter unit.



6. On the *Rate Control* tab, review the *No/Low Flow Timeout*.
   - If the rate of application is not at least 75% of the target rate for this length of time, the display shows a critical fault message and shuts down the system.
   - To change the setting, enter a value between 1 and 10 seconds.
   - Tap **Next**.



7. If the system has the optional Blockage Monitoring, do the following on the *Row Monitoring* tab:
   - From the *Row Monitoring* drop-down list, select *Blockage*.
   - Tap **Setup** and then update the required settings.
   - Tap **Next**.



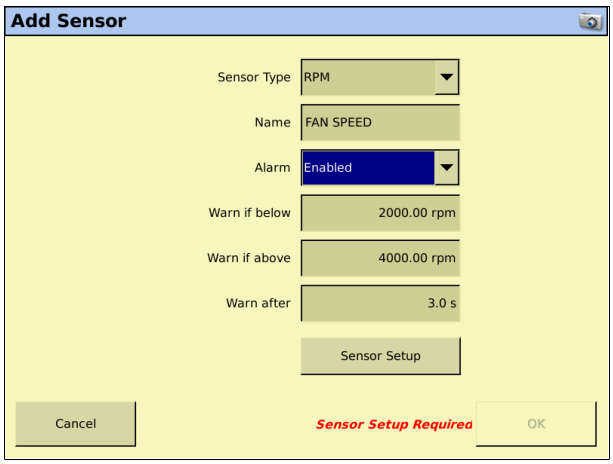
Adding sensors for the location

Various sensors are used with air seeders. See the following sections to set up these common sensors:

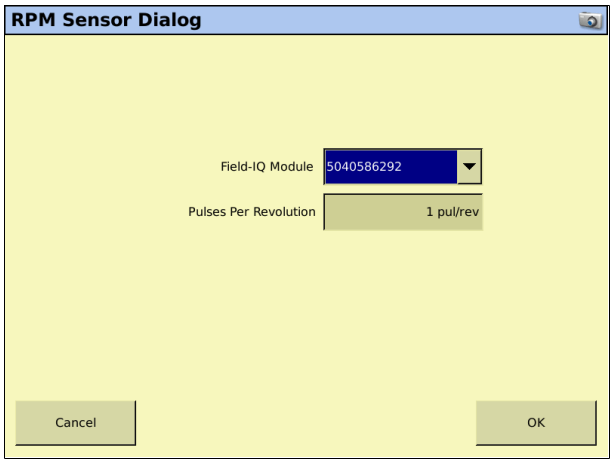
- Fan speed, page 20
- Air pressure, page 21
- Bin level, page 22
- Liquid pressure, page 23

Fan speed

1. On the *Sensors* tab, tap **Add**.
2. On the *Add Sensor* screen, do the following:
   - From the *Sensor Type* drop-down list, select *RPM*.
   - Enter a name for the sensor.
   - Enable the alarm if you want alarms for the sensor.
   - Adjust the alarm settings:
     - *Warn if below*
     - *Warn if above*
     - *Warn after*
   - Tap **Sensor Setup**.



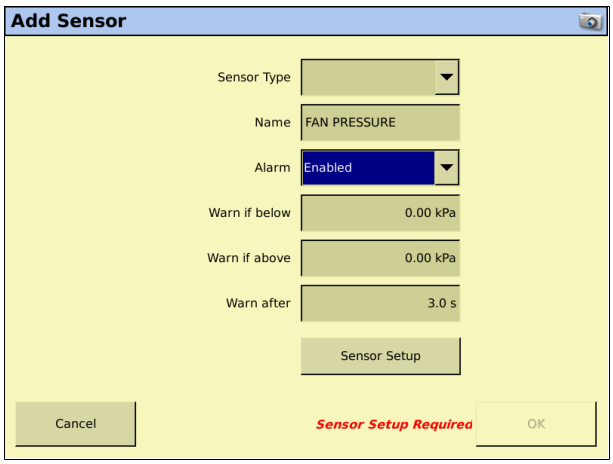
3. In the *RPM Sensor Dialog*, do the following:
   - From the *Field-IQ Module* drop-down list, select the serial number of the Field-IQ module linked to this sensor (commonly the Rate Module on Bin 1).
   - Set the *Pulses Per Revolution* for the sensor.



4. Tap **OK** twice to return to the *Sensors* tab and then do the following:
   - Add any additional sensors.
   - When finished, tap **OK** twice to return to the Home screen.

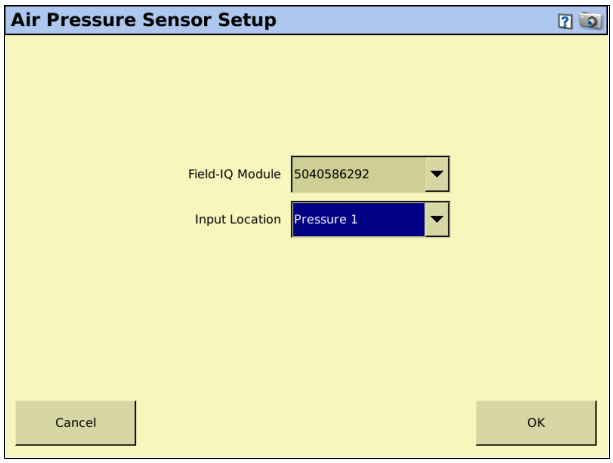
Air pressure

1. On the *Sensors* tab, tap **Add**.



2. On the *Add Sensor* screen, do the following:
   - From the *Sensor Type* drop-down list, select *Air Pressure*.
   - Enter a *Name* for the sensor.
   - Enable the *Alarm* if you want alarms for the sensor.
   - Adjust the alarm settings:
     - *Warn if below*
     - *Warn if above*
     - *Warn after*
   - Tap **Sensor Setup**.

3. On the *Sensor Setup* screen, do the following:
   - From the *Field-IQ Module* drop-down list, select the serial number of the Field-IQ module linked to this sensor (commonly the Rate Module on Bin 1).
   - Select an option from the *Input Location* drop-down list. This is typically *Pressure 1*.

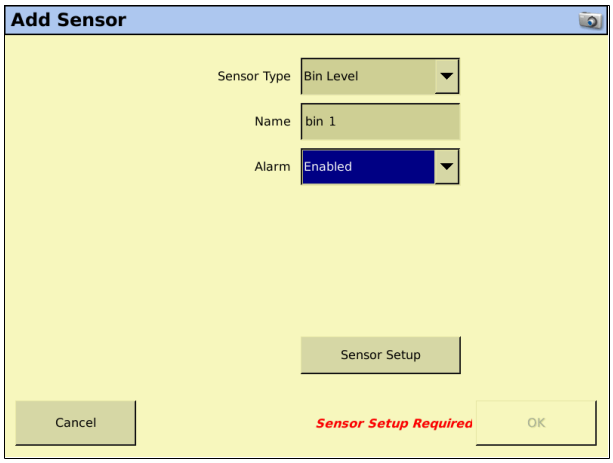


4. Tap **OK** twice to return to the *Sensors* tab and then do the following:
   - Add any additional sensors.
   - When finished, tap **OK** twice to return to the Home screen.

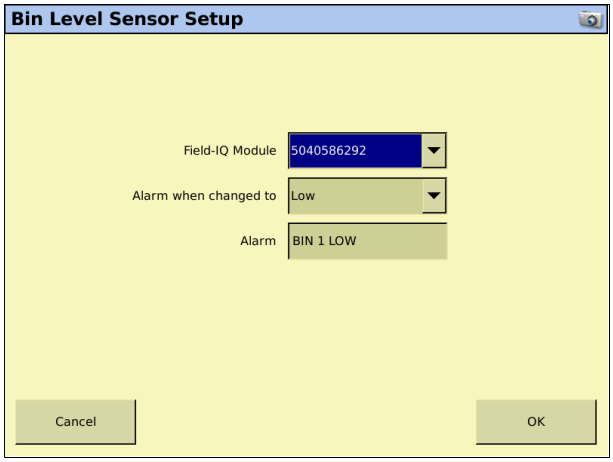
Bin level

1. On the *Sensors* tab, tap **Add**.

2. On the *Add Sensor* screen, do the following:
   - From the *Sensor Type* drop-down list, select *Bin Level*.
   - Enter a *Name* for the sensor.
   - Enable the *Alarm* if you want alarms for the sensor.
   - Tap **Sensor Setup**.



3. On the *Sensor Setup* screen, do the following:
   - From the *Field-IQ Module* drop-down list, select the serial number of the Field-IQ module linked to this sensor.
   - From the *Alarm when changed to* drop-down list, select when the alarm should be triggered:
     - Low - Alarm when bin is empty
     - High - Alarm when bin is full



CAUTION – If you are using Topcon sensors, do the opposite. For example, to see an alarm when the bin is low, set this option to High.

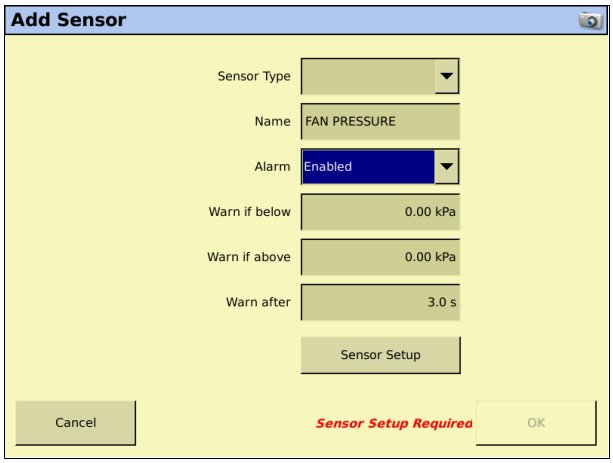
4. Next to *Alarm*, enter the message to be displayed when the alarm is triggered.

5. Tap **OK** twice to return to the *Sensors* tab and then do the following:
   - Add any additional sensors.
   - When finished, tap **OK** twice to return to the Home screen.

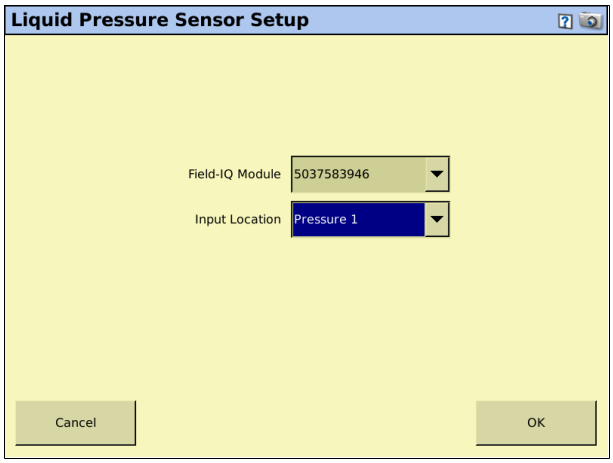
Liquid pressure

1. On the *Sensors* tab, tap **Add**.

2. On the *Add Sensor* screen, do the following:
   - From the *Sensor Type* drop-down list, select *Liquid Pressure*.
   - Enter a *Name* for the sensor.
   - Enable the *Alarm* if you want alarms for the sensor.
   - Adjust the alarm settings:
     - *Warn if below*
     - *Warn if above*
     - *Warn after*
   - Tap **Sensor Setup**.



3. On the *Sensor Setup* screen, do the following:
   - From the *Field-IQ Module* drop-down list, select the serial number of the Field-IQ module linked to this sensor (commonly the Rate Module on Bin 1).
   - Select an option from the *Input Location* drop-down list. This is typically *Pressure 1*.



4. Tap **OK** twice to return to the *Sensors* tab and then do the following:
   - Add any additional sensors.
   - When finished, tap **OK** twice to return to the Home screen.

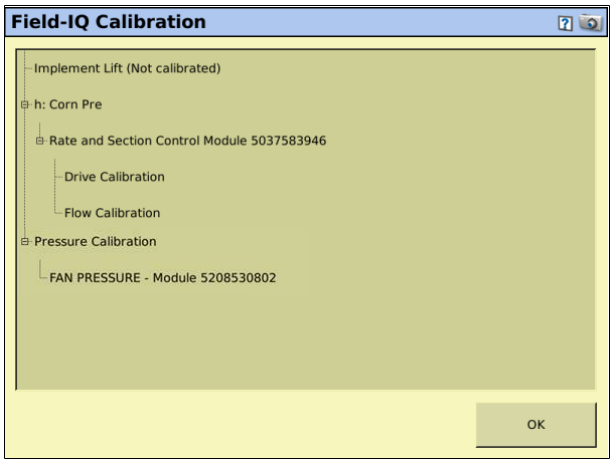
Calibration

To begin calibrating the system, open the *Field-IQ Calibration* screen:

1. On the Home screen, tap the configuration button.

2. On the *Configuration* screen, select *Field-IQ* and then tap **Calibrate**.

3. The *Field-IQ Calibration* screen lists the items that can be calibrated.



4. To calibrate Field-IQ air seeders, complete the following steps:
   - Calibrating the implement lift switch, page 24
   - Calibrating the drive, page 25
   - Calibrating the air/liquid pressure sensor, page 27
   - Calibrating material flow, page 28

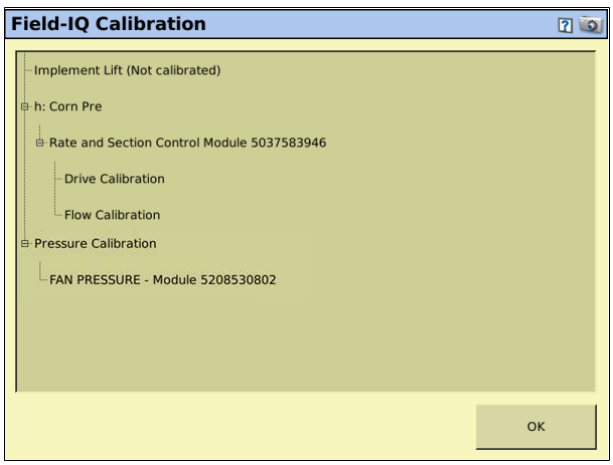
Calibrating the implement lift switch

1. Tap **Implement Lift**.

2. Raise the implement and then tap **Next**.

3. Lower the implement and then tap **Next**.

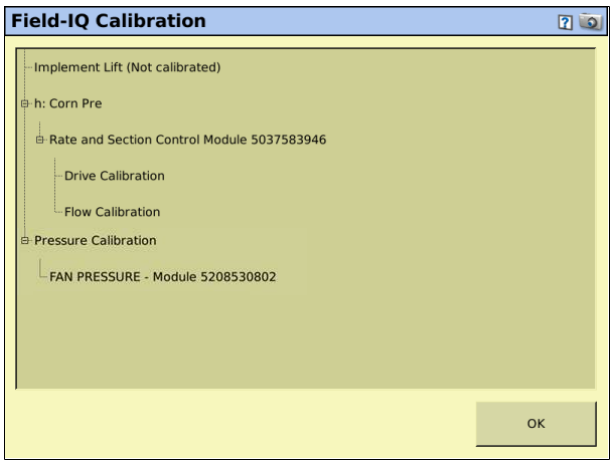
4. Tap **OK** to return to the *Field-IQ Calibration* screen.



Calibrating the drive

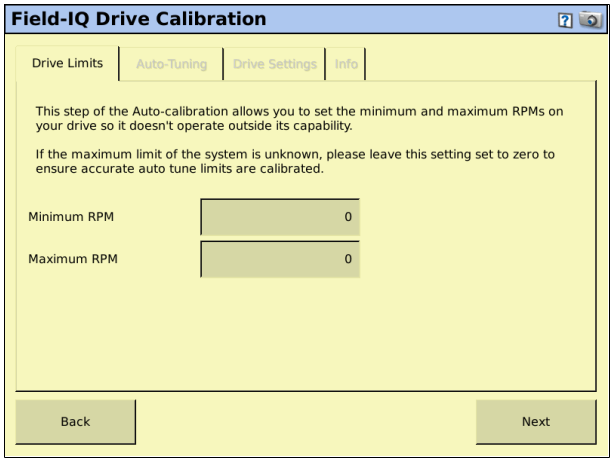
Note – *If the equipment has an implement lift switch, calibrate the lift switch first. See* *Calibrating the implement lift switch, page 24**.*

1. Select the module to calibrate (*Rate* or *Rate and Section Control Module* with serial number).



2. Tap **Drive Calibration**.

3. Review the *Minimum RPM* and *Maximum RPM* values.
   - The default values are usually adequate.
   - If the *Info* tab (see Step 6 below) shows that the maximum speed is not fast enough for operation, enter 0 for *Maximum RPM*.
   - Tap **Next**.



WARNING – Moving parts during this operation. Make sure that the implement is safe to operate.

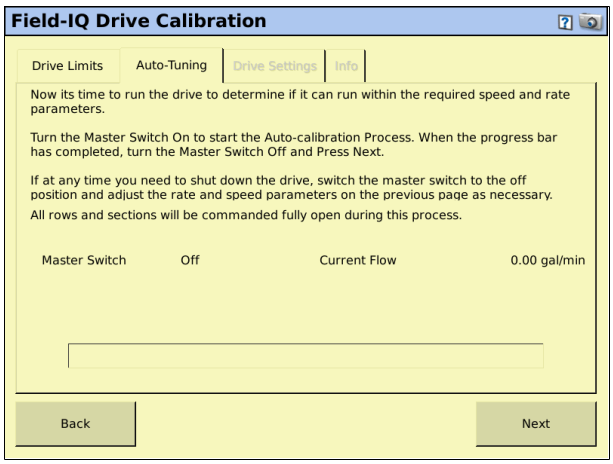
WARNING – Material from bin will be dispensed during calibration.

4. For Linear Actuators go to Step 5.

   For PWM and Electric Over Hydraulic drives, follow the directions on the *Auto-Tuning* tab:

   - Turn the Master Switch **On**.
   - When the progress bar is full, turn the Master Switch **Off** and then tap **Next**.

   Note – *Do not perform the auto-tuning function if you have loaded a preset configuration file. Use the predefined configuration settings appropriate for your implement.*

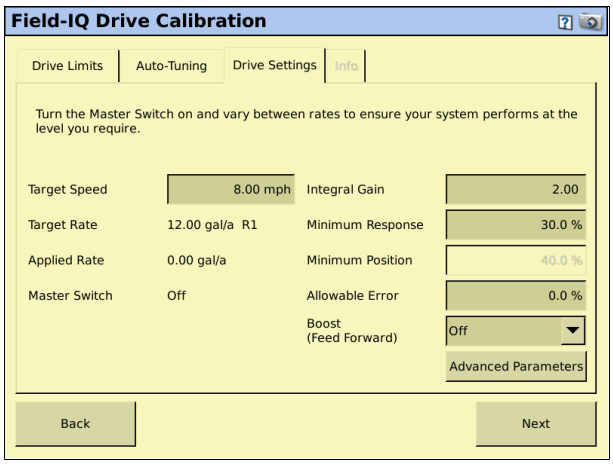


5. On the *Drive Settings* tab, turn the Master Switch **On** and vary the rates.

   Note – *For Linear Actuator calibration, the feedback sensor must rotate. The air seeder needs to be moving at a constant speed.*

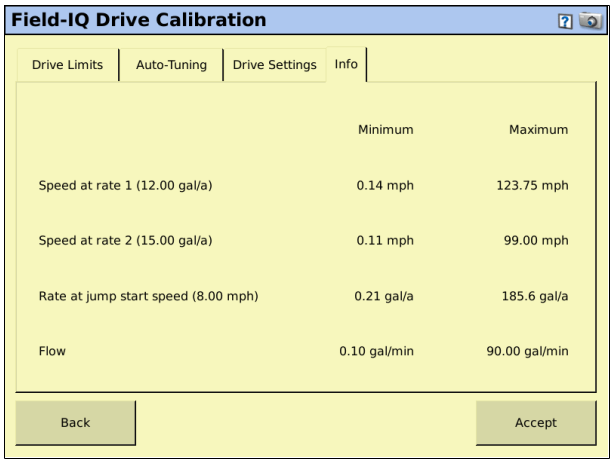
   Adjust values if needed:

   - If the drive is not responding, increase the *Minimum Response*.
   - If the drive is slow to come up to rate, increase the *Integral Gain* and turn on *Boost Feed Forward*.
   - If the Drive is erratic and not holding rate, decrease the *Integral Gain*.
   - *Advanced Parameters* should not be altered.



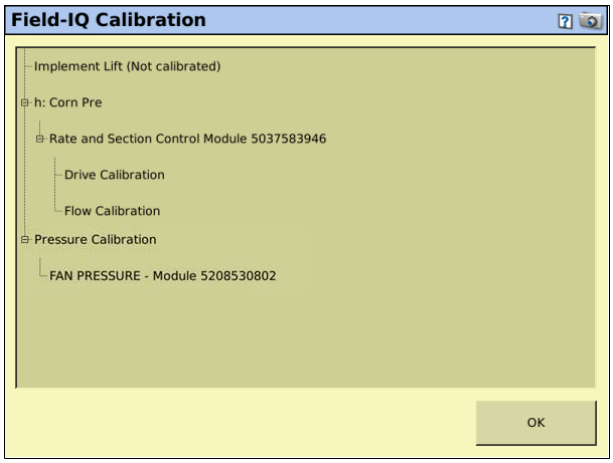
Note – *The Auto-Tuning step populates the fields on this screen. For drives that do not use auto tune, the default settings should be adequate.*

6. Tap **Next** to view the *Info* tab and do the following:
   - Review the calibration data.
   - Tap **Back** to make changes.
   - Tap **Accept** to save the settings and return to the *Field-IQ Calibration* screen.

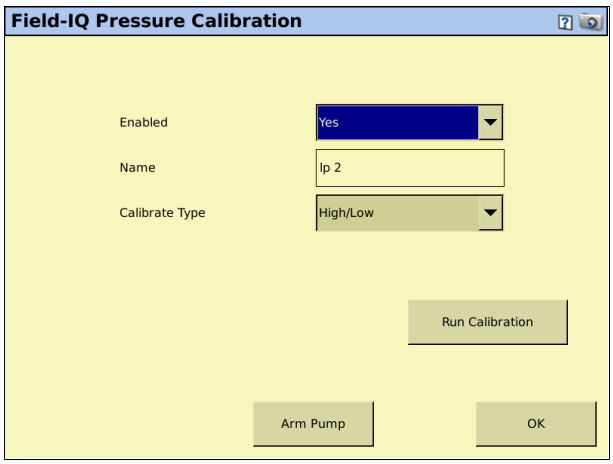


Calibrating the air/liquid pressure sensor

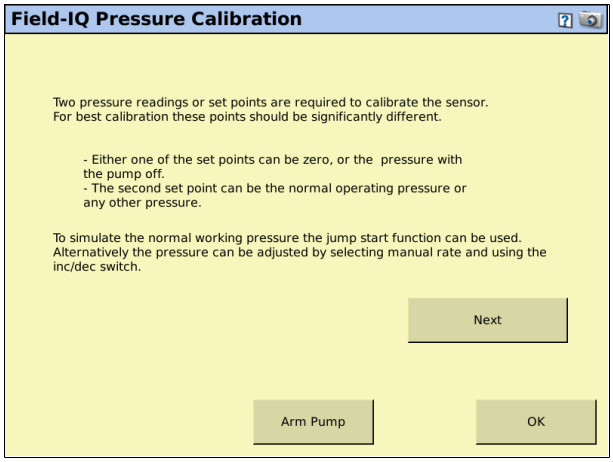
1. On the *Field-IQ Calibration* screen, tap **FAN PRESSURE** in the *Pressure Calibration* section.



2. Make sure that the correct sensor is enabled and then select a *Calibrate Type*. Tap **Run Calibration**.



3. Read the instructions on the screen:
   - You will need a gauge which measures PSI or kPa.
   - Tap **Next** to continue.



4. Without the fan running, take a reading. Enter this value into the *Actual Pressure* field and then tap **Next**.

5. Run the fan at a high RPM and take a reading. Enter this value into the *Actual Pressure* field and then tap **Next**.

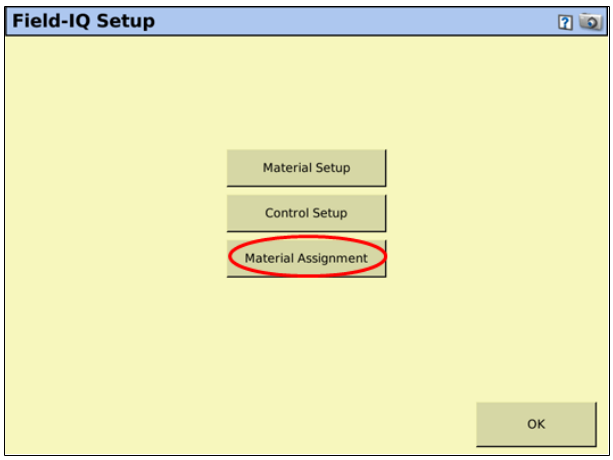
6. The pressure of the fan is displayed. Do the following:
   - Run the fan from minimum to maximum speed to verify the change in pressure.
   - Tap **Accept** if acceptable or tap **Recalibrate** to repeat the process.
   - Tap **OK** to return to the Home screen.

Calibrating material flow

1. On the *Home* screen, tap the configuration button.

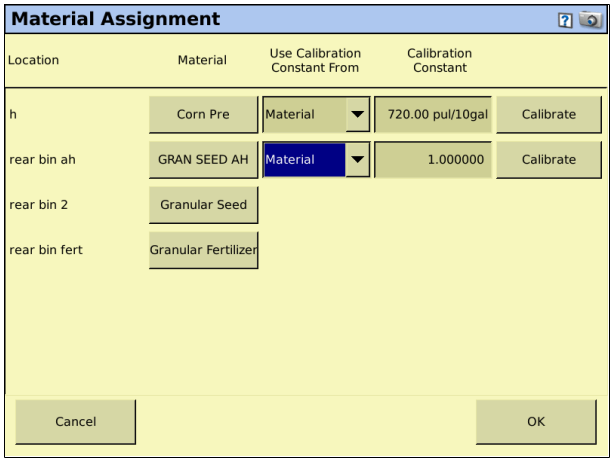
2. On the *Configuration* screen, select *Field-IQ* and then tap **Setup**.

3. Tap **Material Assignment**.

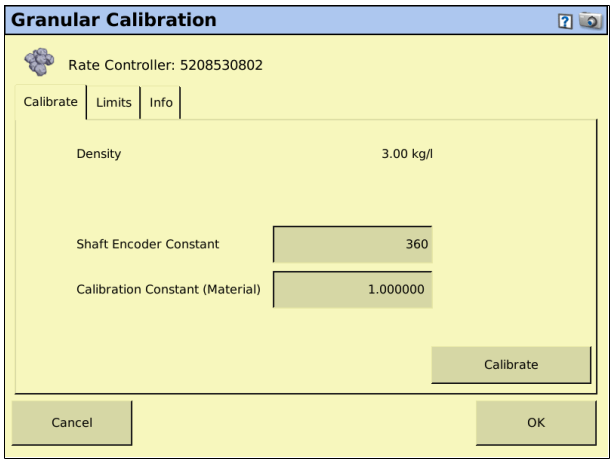


4. In the list of Locations, do the following:
   - Find the location and material that you are preparing to use.
   - From the *Use Calibration Constant From* drop-down list, select *Material*.
   - Tap the **Calibrate** button for the material.

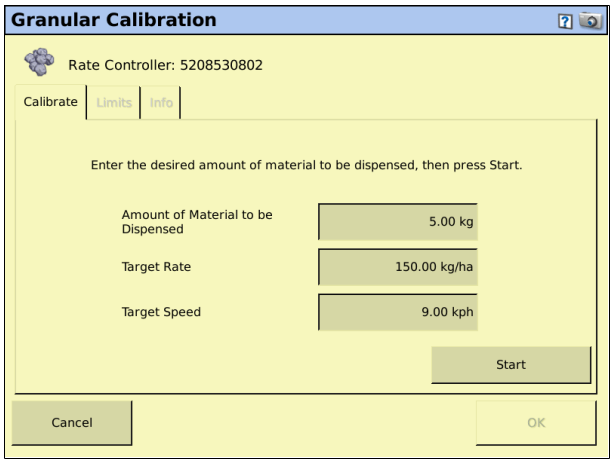
   Note – *Selecting the Calibration Constant in Material Assignment allows you to switch between materials more easily.*



5. Information from material setup is populated on the calibration screen. Tap **Calibrate**.



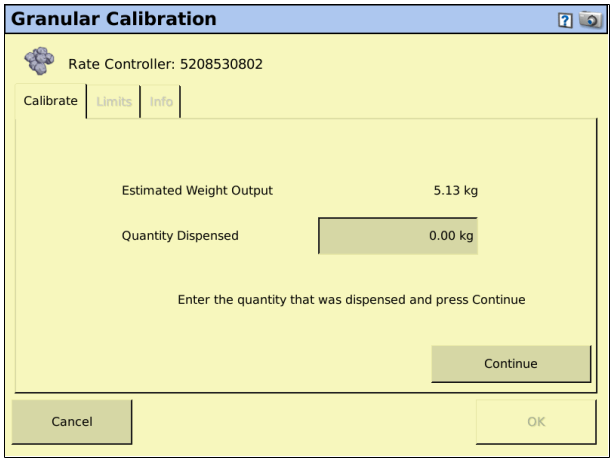
6. Do the following:
   - Enter the amount of material to be dispensed.
   - Review the *Target Rate* and *Target Speed*, populated from material setup.
   - Prime the system.
   - Prepare to catch the material as it drops from the rollers on the air cart.
   - Tap **Start**.



Note – *When told to open the Linear Actuator for calibration, open the linear actuator to its usual operational range for the material.*

7. The system will dispense material. When it stops, do the following:
   - Weigh the dispensed material.
   - Enter the weight into the *Quantity Dispensed* field.
   - Tap **Continue**.

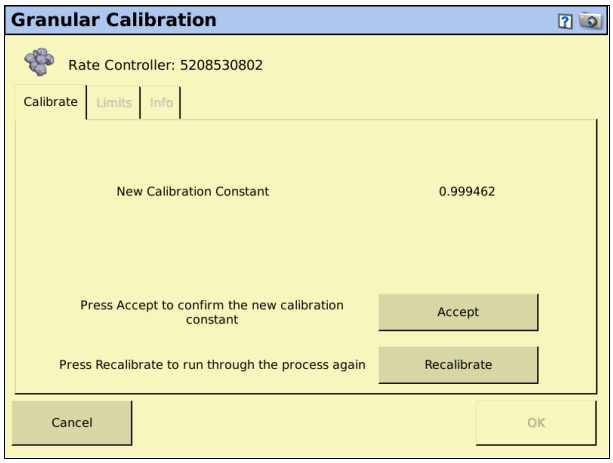
   Note – *For Simplicity air seeders, you may need to manually crank the meter rollers for the material to be dispensed.*



8. Review the *New Calibration Constant*. Tap **Accept** to use this value, or tap **Recalibrate** to repeat the process.

9. On the *Limits* tab, the default minimum and maximum shaft RPM are typically adequate. Tap **OK**.

10. The *Info* tab shows a summary of the rates and speeds for the material. Tap **OK** twice to reach the Home screen.



CHAPTER 2

Operation

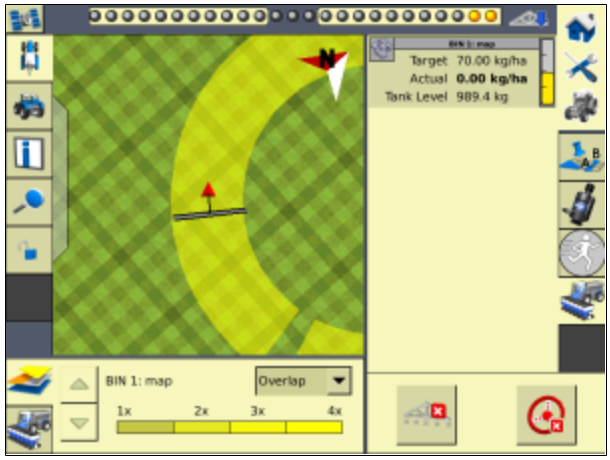
In this chapter:

Run screen controls

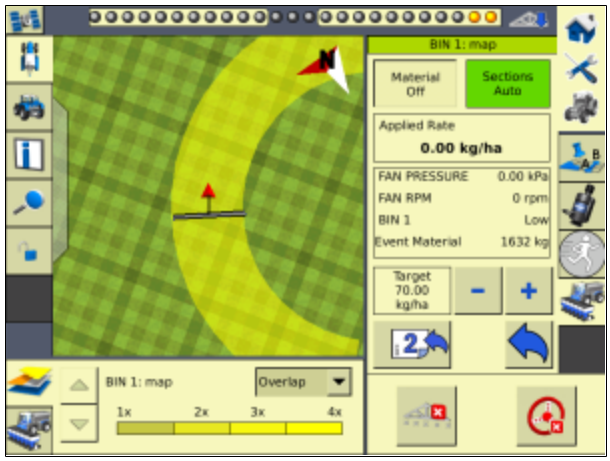
The Field-IQ plugin adds controls to the *Run* screen. Enter a field and open the *Run* screen to begin.

1. The *Run* screen shows the following summary information for each location:
   - Target rate
   - Actual rate
   - Tank level in kg
   - Tank level in visual display

   Tap the location name for additional information on that location.

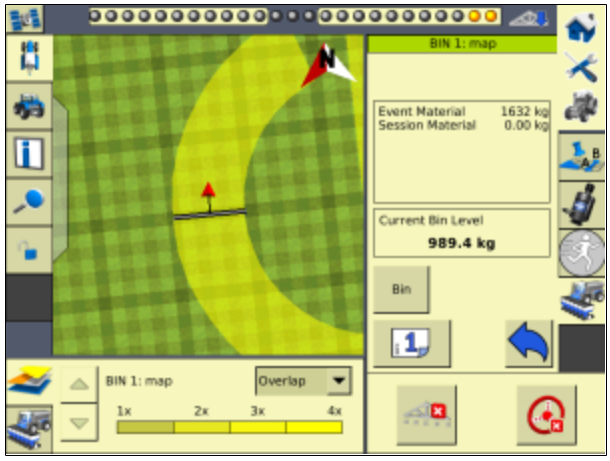


2. From here you can:
   - Turn on or turn off the location (Bin).
   - See sensors that have been assigned to that location (Bin).
   - Adjust the target rate.
   - Tap **2** to view page 2 for more information on the selected location (Bin).
   - Use the back arrow to view the summary information for all locations.



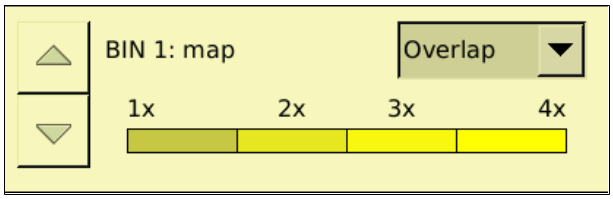
3. Page 2 shows the following:
   - Current bin level (in kg)
   - Event material
   - Session material

   From here you can:
   - Tap **Bin** to refill or partially refill the location.
   - Use the back arrow to view the summary of all locations.



4. At the bottom of the screen, use the arrows to view coverage events for each location (Bin1, Bin2, etc.).

   Use the drop-down list to view coverage data for *Overlap*, *XTE*, *As Applied Rate*, *GPS Quality*, and *Elevation*.

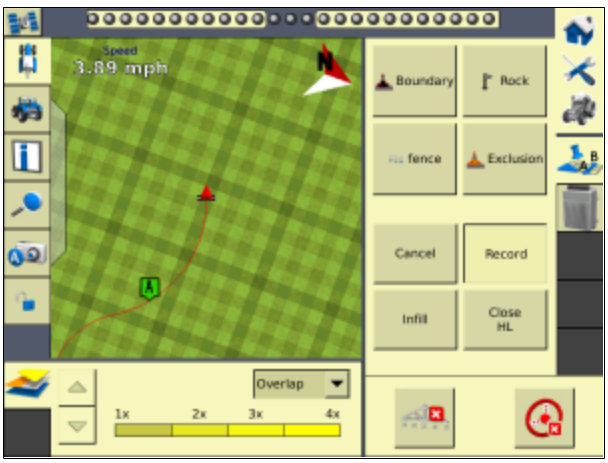


Creating an inner boundary for seeding headlands last

1. On the *Run* screen, do the following:

   - Tap  .
   - Tap **Swaths**.
   - Select the *Headlands* field pattern from the drop-down list.
   - In the *# Headlands* window, enter the width of the headland in swaths. For example, enter 2 for a headland that is 2 swaths wide.
   - If *Boundaries* are *Enabled*, sections will automatically shut off when outside of boundary.
   - For *Infill Boundary*:
     - Select *Inner* to shut off sections when the implement reaches the inner boundary.
     - Select *Outer* to shut off sections when the implement reaches the outer boundary.
   - Tap **New Headland**. The *Run* screen appears, showing the headland definition buttons.

2. To record the headland boundary:

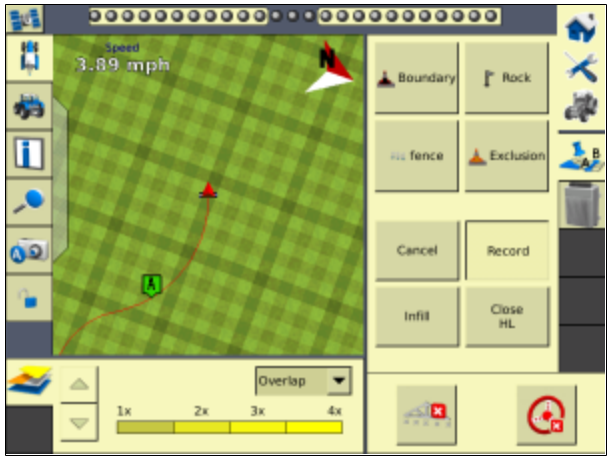


   - Drive to the start point of the outer boundary of the headland.
   - Tap **Record**.
   - Drive along the headland boundary. A red line appears behind the vehicle to show that the headland is being recorded.

3. Drive along the headland boundary until you get to where you want to start a line to be used for the infill pattern.

   To record the infill:

   - Tap **Infill**. The screen changes to show the inner pattern buttons.
   - Tap **Set A**.
   - Do one of the following:
     - To create an AB Line, drive to where you want the end point (at least 50 m (164 ft) away from A) and then tap **Set B**.
     - To create an A+ line, tap **Use A+** and then set the heading for the A+ line.



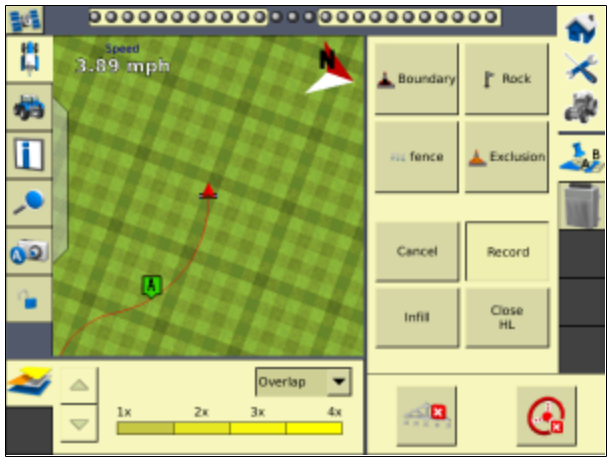
Note – *Once infill lines have been created, they cannot be moved.*

4. Tap **Back to HL** and continue to drive along the headland boundary.

5. When you complete the headland circuit, tap **Close HL**.

   The system draws a straight line from your current position to the start point to close the Headland boundary. Make sure that the vehicle is on the headland circuit where a straight line back to the start will not cut off part of the pattern.

   The new headland appears as a black dotted line.



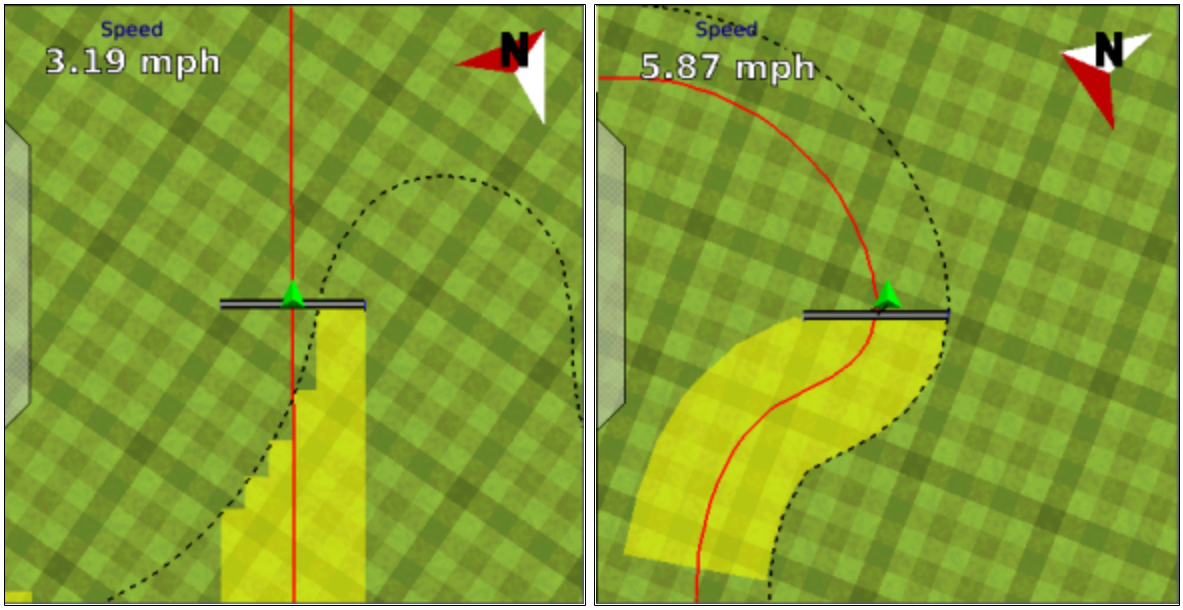
Operating with headlands

On the Run screen, in automatic section control mode, you will see the infill guidance lines and the headland guidance lines.

You can cover the headland circuits first or last.

Guidance lines for Headland circuits may not be visible until the vehicle is parallel with or beyond the infill guidance lines.

Note – *It is not possible to change the infill guidance lines. They do not shift when the Headland shifts. Creating new lines will not apply to existing headlands.*



CHAPTER 3

Troubleshooting

In this chapter:

Testing the system

Testing latency

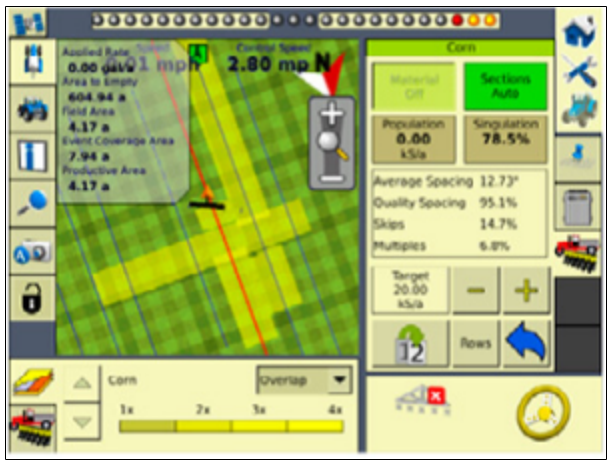
After you set the latency values, test the system to ensure that the values are correct.

Note – *Overlap values should be set to zero for the most accurate test.*

1. Enter a field and drive a swath at a slow speed:
   - For this test, the swath represents a covered area.
   - You do not need to disperse seed or liquid. You only need to draw a covered area.

2. Turn the vehicle and drive toward the covered area at a right angle.

3. Monitor the location at which the clutches activate when entering the covered area, and deactivate when exiting the covered area. Drop a marker at the location when you see the clutch or section start and stop.



4. When entering the covered area:
   - If the clutches turn off too early, decrease the *Off Latency* value.
   - If the clutches turn off too late, increase the *Off Latency* value.

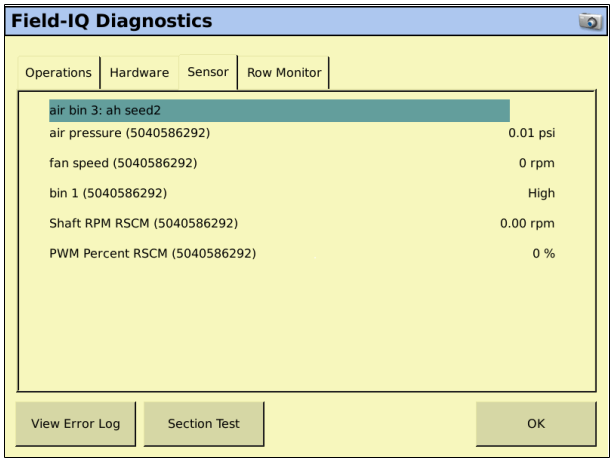
   To set the latency, see Setting up section control for the location, page 14.

Testing bin level sensors

1. On the Home screen of the FmX display, tap the configuration button.

2. On the *Configuration* screen, select *Field-IQ* and then tap **Diagnostics**.

3. Select the *Sensor* tab.



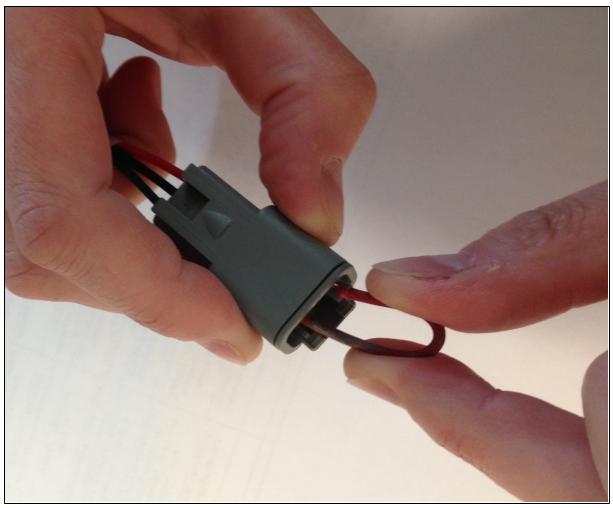
4. Cover the bin level sensor and make sure that the bin level reading on the display changes to *High*.

   Note – *Topcon sensors should show Low when covered.*

5. Uncover the bin level sensor and make sure that the bin level reading on the display changes to *Low*.

   Note – *Topcon sensors should show High when uncovered.*

6. If the display does not show the bin level change, then do the following:
   - Disconnect the bin level sensor.
   - Using long nose pliers or wire, bridge the signal and ground wires going back to the Field-IQ module.



7. If the bin level on the *Diagnostics* screen changes, then replace bin level sensor.

   If bin level reading does not change:
   - Check wiring and connections.
   - Check the bin level sensor setup in the display. See Bin level, page 22

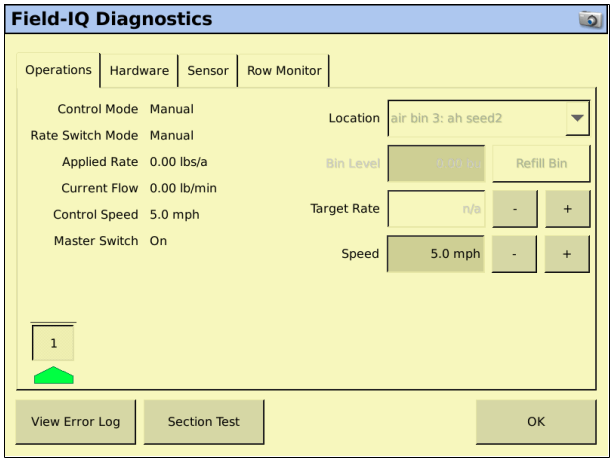
Testing shaft encoders

1. On the Home screen of the FmX display, tap the configuration button.

2. On the *Configuration* screen, select *Field-IQ* and then tap **Diagnostics**.

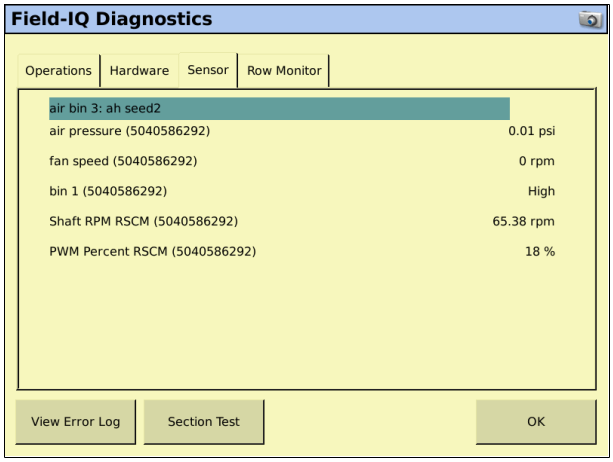
3. On the Master switch box, set the Rate switch and the Section switch to Manual.

4. Enter a speed and then turn the Master switch to On. Tap the gray number button above the triangle at the bottom left of the screen.



5. Select the *Sensor* tab.

6. Turn the seed metering shaft and make sure that the display shows the *Shaft RPM*.



7. If the display does not show the *Shaft RPM*, do the following:
   - Disconnect the wiring to the encoder.
   - Using long nose pliers or wire, tap the ground and signal wires to create a pulse.
   - Make sure that the *Shaft RPM* on the display changes.

8. If the display still does not show the *Shaft RPM*, check the wiring.

   If the display shows the *Shaft RPM*, test power to the encoder.
   - If the encoder is getting power, the encoder is faulty.
   - If the encoder is not getting power, check the wiring.

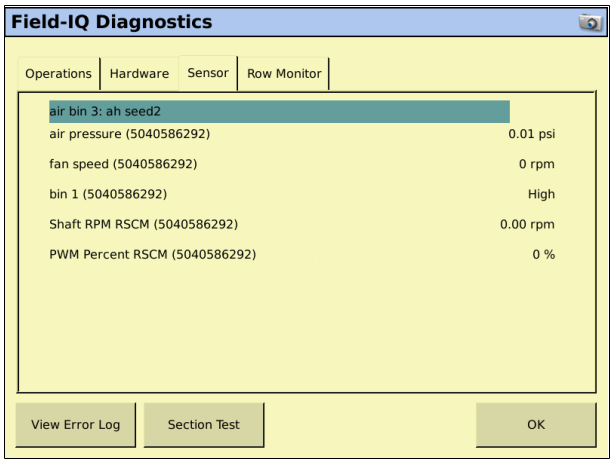
Testing the fan speed sensor

1. On the Home screen of the FmX display, tap the configuration button.

2. On the *Configuration* screen, select *Field-IQ* and then tap **Diagnostics**.

3. Select the *Sensor* tab and then turn the fan on.

4. Make sure that the display shows the fan RPM.



5. If the display does not show the fan RPM, do the following:
   - Disconnect the wiring to the fan sensor.
   - Using long nose pliers or wire, tap the ground and signal wires to create a pulse.
   - Make sure that the display shows the fan RPM.

6. If the display still does not show the *Fan RPM*, check the wiring.

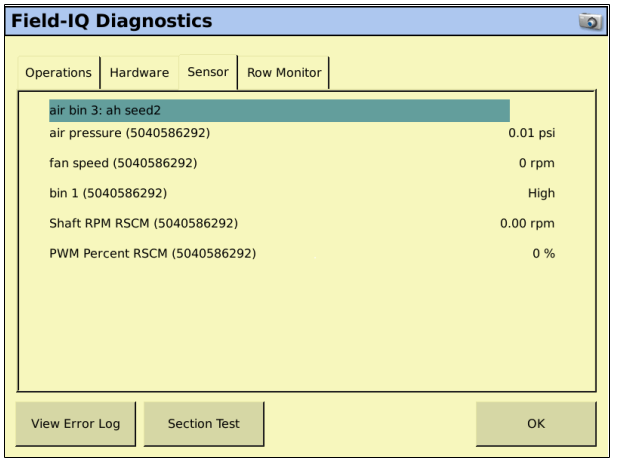
   If the display shows the *Fan RPM*, then test power to the fan sensor:
   - If the fan sensor is getting power, the sensor is faulty.
   - If the fan sensor is not getting power, check the wiring.

Testing air/liquid pressure sensors

1. On the Home screen of the FmX display, tap the configuration button.

2. On the *Configuration* screen, select *Field-IQ* and then tap **Diagnostics**.

3. Select the *Sensor* tab.



4. Run the fan and make sure that the *Air/Liquid Pressure* changes on the display.

5. If the display does not show a change, then do the following:
   - Disconnect the wiring to the air/liquid pressure sensor.
   - Using long nose pliers or wire, bridge the signal and ground wires going back to the Field-IQ module.
   - Make sure that the display shows that the pressure is low (near 0 kpa or psi).
   - Using long nose pliers or wire, bridge the signal and ground wires going back to the Field-IQ module.
   - Make sure that the display shows that the pressure is high.

6. If the pressure on the *Diagnostics* screen does not change, check the wiring.

   If pressure reading changes, then test the power to the pressure sensor.
   - If the sensor is getting power, the sensor is faulty.
   - If the sensor is not getting power, check the wiring.

Troubleshooting

Error/issue	Do one or more of the following ...
No FIQ Devices Detected	• Check power going back to the Field-IQ modules. • Check fuses. • Ensure power is connected direct to battery.
No Row Sensors Detected	• Check the connections at the seed sensing module. Make sure that the AUX I/O connector is plugged into the sensor power connector. • Check for power and grounds at the seed sensors. • Cycle power on the display.
Unit/Module Offline	• Cycle power on the display and Field-IQ modules.[1] • Check cabling: Refer to the *Cabling Guide* for the correct cabling. • Check fuses. • Check power and grounds at the module harness.
Calibration Fails	• Cycle power to the display and Field-IQ modules.[1] • Check cabling to the control valve and feedback sensor. • Manually check for oil at the control valve. • Check feedback sensors cabling and feedback sensor is secure and functional. • Check for power going to drives. • For linear actuators, make sure that actuators have been manually opened using manual rate mode prior to conducting flow calibration.
System will not calibrate small seeds	• Enter a starting *Calibration Constant* of 0.1. • If you are not manually commanding linear actuators open, then increase manual rate increment in material setup.
Motors/Actuators will not respond in flow calibration	Make sure that all bins are enabled from the Run screen
No Flow Detected	• Make sure that the motor is responding. • Check feedback sensor cabling and make sure that the sensor is secure and functional. • Make sure that power is getting to the feedback sensors from the Field-IQ module. • Make sure that any material or bin clutches are energizing to engage meter rollers so feedback sensor can turn over. • Increase the *No/Low Flow Timeout* from 5 seconds up to 15 seconds. • Run jump start mode in an attempt to get the drive to turn over.

Error/issue	Do one or more of the following ...

	• Make sure that the motors/actuators are turning:
	  • Open the *Diagnostics* screen.
	  • Set the master switch box to manual rate, manual section control, and add speed.
	  • Turn on the Master switch and then press the increment button.
	  • Make sure that the motor/actuator is turning and there is feedback (Flow Kg/min or lbs/min) on the Diagnostics screen.
	• If motors/ actuators are not turning:
	  • In Material setup, edit material and change *Manual Rate Increment %* to 1000 %. See Setting up materials, page 8.
	  • If motors/actuators turn and give feedback, go into *Drive Calibration* and check motor performance for auto control. See Calibrating the drive, page 25
	  • If motors/actuators do not turn, check the wiring.
	• If motors/actuators turn, but no feedback shows on the *Diagnostics* screen:
	  • Check shaft sensor and wiring.
	  • Make sure that chains and cogs are tight and are spinning the seed metering shaft.

Low Flow Detected	• Change maximum rpm setting in the drive calibration screen to 0. • Make sure that flow calibration is correct. • Make sure that all chains and cogs are tight and are not slipping.
Field-IQ is draining tractor battery	• Install the implement relay harness.

1 If you are using an implement relay harness then make sure that the relays are energizing when you power the display on and off. If not, you must cycle power on the Field-IQ modules by physically disconnecting the large 4 pin DTP connector running to the battery.