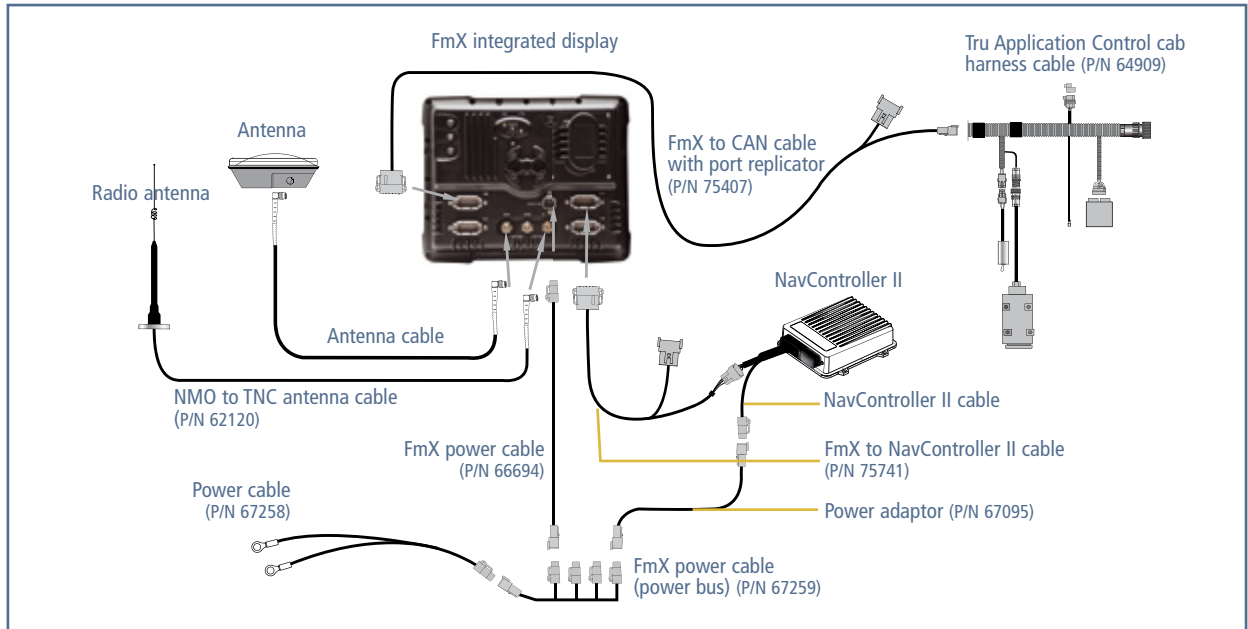


with the AgGPS® Tru Application Control™ System Quick Reference Card

This Quick Reference card describes how to configure the AgGPS® FmX™ integrated display for seed planting, granular fertilizer, strip-till, liquid fertilizer, granular seed planting, or anhydrous application.

CONNECTING THE SYSTEM

Once the AgGPS Tru Application Control™ system has been professionally installed, add the FmX integrated display as shown:



RUN SCREEN LAYOUT

Offline guidance display – When the vehicle is online, the center indicators are green. When the vehicle moves offline, the indicators change to red and move to either side, depending on the direction to the line.

Status items – At the top of the run window, visible all the time. Tap on either text item to toggle to a single status item with larger font.

Status items tab – Used to display a variety of text information for the operations connected to the FmX integrated display. Tap the status tab to bring it into view. It can be set to retract automatically.

Coverage theme – Panel displays the coverage and variety tracking settings. Height, coverage/overlap, variety, and GPS quality can be displayed.

Information tab – Shows row sensors, accessory sensors, and allows access to override automatic section control.

Vehicle icon – Shows the vehicle position and heading relative to the current swath.



Engage panel – Presents the engage controls for plugins such as Autopilot, TrueTraker™ implement steering, and FieldLevel II. Coverage logging can also be controlled from the engage panel.

Picture-in-picture – Displays the alternative view to the main window. Tap this space to toggle the main map window between map and perspective view. Tap the main map window to adjust the zoom level.

Home – Use to close a field and return to the start window.

Setup and Configuration – Allows you to change some setup and display options when the field is open. Remains as a run screen icon.

Tractor icon – Tap to get started in a field..

Active plug-in tabs – Display status and control functions for the applications connected to the FmX display. Tap the Tab icon to change the tab.

Channel Control tabs – Use to monitor all four channels; also allows detailed monitoring/control of one channel at a time.

CONFIGURATION PROCEDURE

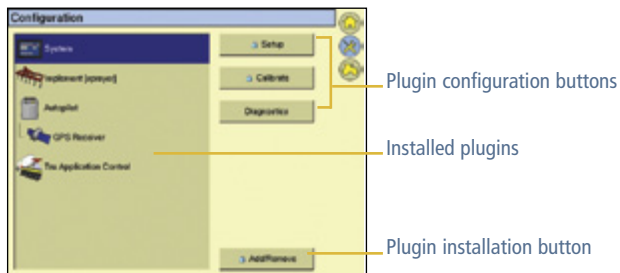
To configure the Tru Application Control system, open the *Configuration* screen and then complete the following steps:

1. Install the Tru Application Control plugin.
2. Configure the implement.
3. Configure the modules.
4. Configure the row sensors.
5. Configure the materials.
6. Assign the materials to channels.
7. Configure additional sensors.
8. Calibrate the channels and sensors.

For a more detailed description of these steps, refer to the latest version of the *AgGPS FmX Integrated Display User Guide*.

THE CONFIGURATION SCREEN

To configure the FmX integrated display, tap the *Configuration* icon . The *Configuration* screen appears:

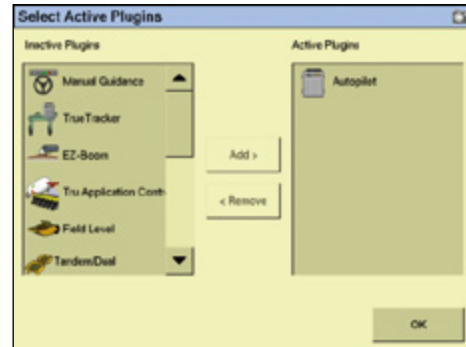


STEP 1: INSTALLING THE TRU APPLICATION CONTROL PLUGIN

The FmX integrated display uses a series of plugins to control which parts of the system are installed. For example, to add the Tru Application Control functionality, install the plugin. You can then configure the settings so that you can use the Tru Application Control from the Run screen.

Note: To install the Tru Application Control plugin, you must purchase an upgrade for the display from a Trimble reseller.

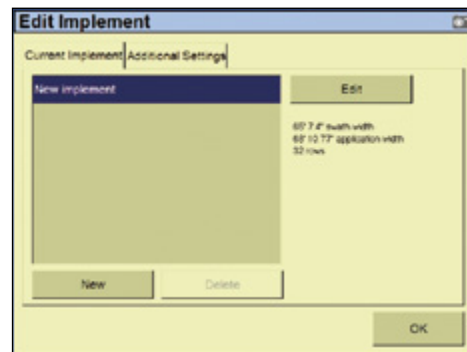
To enable Tru Application control capabilities, install the Tru Application Control plugin:



1. From the *Configuration* screen, tap **Add/Remove**. If required, enter the Administration password and then tap **OK**. In the *Select Active Plugins* screen
 - The plugins that are currently installed appear in the *Active Plugins* list on the right.
 - The plugins that are not currently installed appear in the *Inactive Plugins* list on the left.
2. If the Tru Application Control plugin is not currently installed, select it and then tap **Add >**. The plugin moves to the *Active Plugins* list.
3. Tap **OK**. The *Configuration* screen reappears.

STEP 2: CONFIGURING THE IMPLEMENT

1. From the *Configuration* screen, tap **Implement** and then tap **Setup**. The *Edit Implement* screen appears:

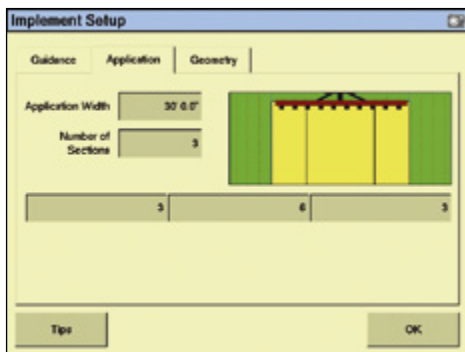


2. To create a new implement, tap **New** and then enter a name for the implement, or select the implement that is being used and then tap **Edit**.

3. In the *Guidance* tab, set the *Swath Width*, *Application Offset*, *Left/Right Offset*, and *Rows* to match your implement:



4. Tap the *Application* tab. Set the *Application Width*, *Number of Sections*, and number of rows in each section:



Note: In most applications, application width is usually the same as swath width. The section fields will not appear if a section control output module is not present.

5. Tap the *Geometry* tab. From the *Type* drop-down list, select whether the implement is a 3-point hitch or a drawbar.
6. In the *Hitch to Ground Contact Point*, enter the distance and then tap **OK**.

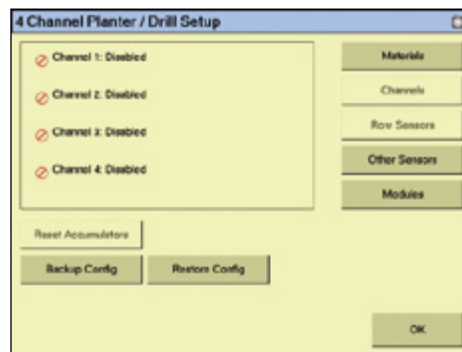
Note: The following settings apply only when using TrueGuide: *Antenna Front/Back*, *Antenna Left/Right Offset*, *Antenna Height*.

7. Tap **OK** a second time.

STEP 3: CONFIGURING THE MODULES

In this step, configure the modules that are connected to the system. These modules control the sections on the implement.

1. From the *Configuration* screen, select the *Tru Application Control* plugin and then tap **Setup**. The *4 Channel Setup* screen appears:



2. Tap **Modules**. The *Tru Application Control Setup* screen appears.
3. Tap **Auto Config**. The modules are automatically detected.

Tip: If required, adjust the order of the module to correspond to the actual rows/output that are connected on the implement.

4. Select each module, configure the settings and then tap **OK**.

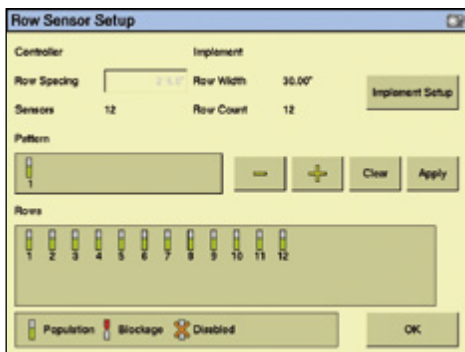
STEP 4: CONFIGURING THE ROW SENSORS

In this step, you set how each of the row sensors are used.

If you do not require row monitoring, or if you are using a sprayer, spreader, or anhydrous unit, go to Step 5.

1. From the *4 Channel Setup* screen, tap **Row Sensors**. The *Row Sensor Setup* screen appears. The rows appear in the *Rows* list. If there are more rows than sensors, some of the rows will appear without sensors.
2. Use one of the following methods to configure the rows:
 - Tap the row icons in the *Rows* list to adjust their settings. Tap each icon until it represents the row and sensor setup.

- Use the *Pattern* list to create a pattern for the rows. Press to add sensors to the *Pattern* list, tap each icon to adjust it and then tap **Apply** to apply the pattern to the *Rows* list.

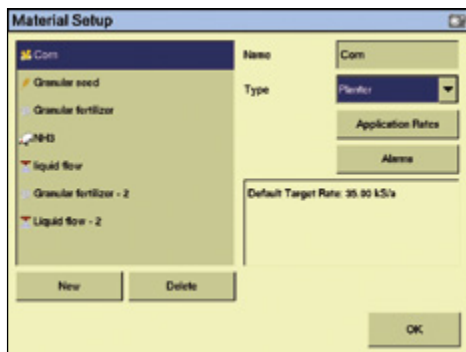


3. Tap **OK**.

STEP 5: CONFIGURING THE MATERIALS

Configure the materials you will apply. These may be different types of seed, fertilizer, liquid, or anhydrous, depending on the application.

1. From the *4 Channel Setup* screen, tap **Materials**. The *Material Setup* screen appears:



2. To enter a new material:
 - a. Tap **New** and then enter a name for the material.
 - b. Ensure that the material is selected in the list on the left of the screen.
 - c. In the *Type* list, select the type of application. It can be Planter, Liquid Flow, Granular Seed, Granular Fertilizer, or Anhydrous.

3. To configure the rates at which the material will be applied, tap **Application Rates**. The *Application Rate Setup* screen appears. The options available on the screen change depending on the application type:

For this application type	Enter ...	To define ...
Planter/Liquid/ Granular Seed/ Granular Fertilizer/ Anhydrous	Minimum Rate	the lowest rate the system allows you to select.
	Maximum Rate	the highest rate the system allows you to select.
	Increment/ Decrement	the percentage the application rate changes when you manually adjust the rate.
Planter	Seeds per revolution	the number of seeds planted per rotation of the seed disks.
	Disk RPM Low Limit	the lowest disk RPM at which control channel will operate.
	Disk RPM High Limit	the highest disk RPM at which control channel will operate.
Liquid flow	Low Flow Limit	the lowest rate at which the system will operate.
	High Flow Limit	the highest rate at which the system will operate.
Granular Seed / Granular Fertilizer	Density	the weight per volume of the material (if unknown, use 1).
	Spreader Const	the number of app rate sensor pulses per liter (if using imperial units) or per cubic feet (if using metric units) of material.
Granular Seed	Seeds per Pound	the number of seeds per pound.
	Low Shaft RPM	the lowest shaft speed at which the control channel will operate.
	High Shaft RPM	the highest shaft speed at which the control channel will operate.
Granular Fertilizer	Low RPM Limit	the lowest shaft speed at which the control channel will operate.
	High RPM Limit	the highest shaft speed at which the control channel will operate.

4. Add a new preset rate:
 - a. Tap **Add**.
 - b. Enter the preset rate. You will be able to select this rate for the material on the *Run* screen.
 - c. To add additional preset rates, repeat Steps a and b. You can add up to 8 preset rates that are accessible from the *Run* screen.

d. Tap **OK**. The *Material Setup* screen reappears.

Note: At least one preset rate is required. The rate-labeled default is used when a field is first opened. This rate is also used for calibration.

5. Set the alarm levels:

a. From the *Material Setup* screen, tap **Alarms**. The *Alarms Setup* screen appears. The options available on the screen change depending on the application type:

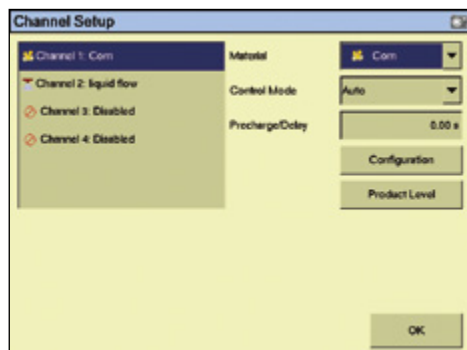
For this application type	Enter ...	To define ...
Planter / Granular Seed	High Population Alarm	what percentage over the preset rate will trigger a warning.
	Low Population Alarm	what percentage under the preset rate will trigger a warning.
	High Alarm Delay	the delay before the high population warning appears.
	Low Alarm Delay	the delay before the low population warning appears.
	Min Row Fail Rate	the acceptable failure rate before the Row Fail alarm is triggered.
Planter/Liquid/Gr Seed/Gr Fert/Anhy	Product Level Alarm	the level of product that will trigger the low product level alarm.

b. Tap **OK**.

6. The material is now configured. Repeat the process to add another material or tap **OK** if the procedure is complete.

STEP 6: ASSIGNING THE MATERIALS TO CHANNELS

Once the materials are configured, assign them to channels. Multiple channels enable you to control each application separately:



CAUTION — Ensure that the channels that you configure match the hardware configuration on the implement. For example, set up the components (material) connected to PWM1/FB1 as Channel 1. For more detail, refer to the cabling documentation.

1. From the *4 Channel Setup* screen tap **Channels**. The *Channel Setup* screen appears.
 2. Select the channel to configure from the list on the left of the screen.

3. From the *Material* list, select the material.

Note: For *Anhydrous application*, go to step 5 in this section.

4. In the *Control Mode* list, select how the control channel will calculate application rates:

Item	Description
Auto (default)	The control channel automatically calculates application rates and adjusts them according to speed under normal operating conditions.
Manual with Feedback	This value is rarely used in the event of a mechanical sensor failure. See the <i>AgGPS FmX Integrated Display User Guide</i> for additional information.
Manual without Feedback	This value is rarely used in the event of a mechanical sensor failure. See the <i>AgGPS FmX Integrated Display User Guide</i> for additional information.
Monitor Only	The system monitors seed population or row blockage and/or allows Tru Count row shut-off control, when the system notes that auto rate control is used.

5. Enter the *Precharge/Delay* time. This helps compensate for delays in material delivery when starting the next pass.

6. Configure the channel:

- a. Tap **Configuration**. The *Channel Configuration* screen appears.

Enter the following in the *Valve Settings* tab:

For this application type ...	Enter ...	To define ...
Planter/Liquid/ Granular Seed/ Granular Fertilizer/ Anhydrous	Drive Type	the drive type hardware (PWM, Servo, or Servo Return).
	Drive Frequency	the drive frequency. (If you are using a DICKEY-john valve, leave this setting as the default.)
	Input Filter	the amount of filtering applied to the feedback frequency. Do not change this setting unless instructed to by Technical Support.
Liquid	Flush	whether Flush mode is enabled.
	Valve Locking	whether the valves lock in their operating position at boom shutoff.

Enter the following in the *Constants* tab:

For this application type ...	Enter ...	To define ...
Planter/Gr Seed/Gr Fert	Sensor Constant	the number of pulses per revolution of the sensor. If you use a DICKEY-john application rate sensor, set the constant to 360.
	Gear Ratio	how many times the application rate sensor turns for each turn of the seed disk/metering shaft.
Liquid / Anhydrous	K-Factor	the number of pulses per liter (if using imperial units) or per cubic feed (if using metric units) that the sensor produces.
Planter/Liquid/ Gr Seed/Gr Fert/ Anhy	Channel Width	the combined width assigned to this channel.

Enter the following in the *Rows / Sections* tab:

For this application type ...	Enter ...	To define ...
Planter/Gr Seed	Number of Rows	the number of rows assigned to the channel.
Planter/Liquid/ Granular Seed/ Granular Fertilizer/ Anhydrous	Channel Width	the combined width assigned to this channel.
	Off Latency	the time it takes for the control channel to go from a running state to a stopped state. Enter a time (in seconds) for the True Application Control system to automatically turn the channel on later using the off latency value to ensure that the system is at operating speed when entering an uncovered area.
	On Latency	the time it takes for the control channel to go from a stopped state to a running state. Enter a time (in seconds) for the True Application Control system to automatically turn the channel on later using the on latency value to ensure that the system is at operating speed when entering an uncovered area
Liquid/ Gr Fert/ Anhy	Channel as Sections	when enabled, automatically turns a control channel on or off based on the coverage map, field boundaries or exclusion areas

Enter the following on the *Anhydrous* tab:

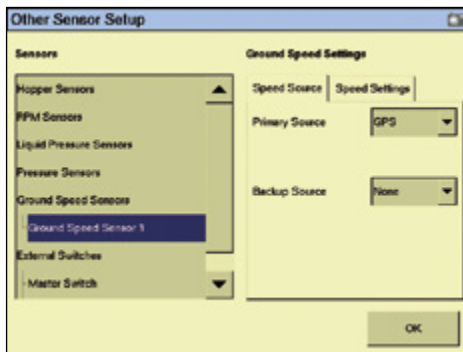
For this application type ...	Enter ...	To define ...
Anhydrous	Measurement Unit	the unit of measure that is displayed: N (Nitrogen) or NH3 (Anhydrous Ammonia).
	Max Flow Rate	the maximum rate at which the implement can apply anhydrous ammonia.

- b. Tap **OK**.

7. Enter the product level information (**Optional**):
 - a. Tap **Product Level**. The *Channel Product Level* screen appears.
 - b. In the *Capacity* field, enter the amount of product that the implement channel holds.
 - c. In the *Reset Level* field, enter the partial level if you partially refill to a point.
 - d. In the *Partial Refill* field, enter the amount that you will add if you perform a partial refill in the field.
8. Tap **OK** twice. The channel is configured. Repeat this process for any additional channels.

STEP 7: CONFIGURING ADDITIONAL SENSORS

1. From the *4 Channel Setup* screen, tap **Other Sensors**. The *Other Sensor Setup* screen appears:



2. Configure the ground speed sensor.
3. Configure the implement lift switch, if present.
4. Configure any additional sensors, if present..
5. Tap **OK** twice. Select each of the additional sensors and then configure it.

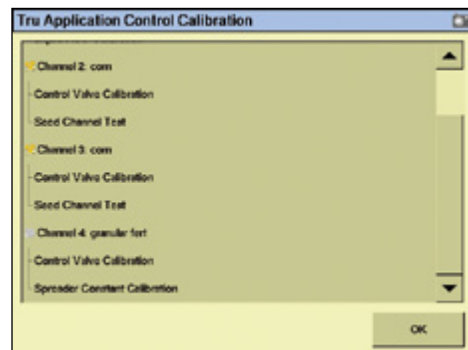
For more information on individual sensor configuration settings, refer to the latest version of the *AgGPS FmX Integrated Display User Guide*.

STEP 8: CALIBRATING THE CHANNELS AND SENSORS

Calibration must be performed before field operation.


WARNING — During some calibration sequences, the implement will become operational. Take all necessary precautions to ensure user safety. Failure to do so may result in serious injury or death.

1. From the *Configuration* screen select the Tru Application Control plugin and then tap **Calibrate**. The *Tru Application Control Calibration* screen appears:



2. Select each sensor and then follow the on-screen instructions.

GETTING STARTED IN A FIELD

1. In the *Home* or *Configuration* screen, tap .
2. Select or create client, farm, field, and event names for the operation and then tap **OK**.
3. On the *Run* screen, tap **Swaths**. The *Swaths management* screen appears.
4. From the drop-down box, select the pattern type (AB, Curve, Pivot, or Headland) and then tap the **New <>** button (for example, **New Straight** or **New Curve**).

Note: Use the Headland pattern when you do not want the application to operate outside the field boundary. If you select this pattern, the Tru Application Control system shuts off boom sections outside the field boundary. If you select another pattern, the Tru Application Control system shuts off sections only when it is in a covered area.

5. On the *Run* screen, tap **Set A** and follow the on-screen instructions to finish the pattern.
6. Once the new swath has been created, tap **Engage** to engage the Autopilot system. To activate the Tru Application Control system, activate the Master Switch

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and lower the implement if you are using an implement switch.

To create areas exclusion zones (areas where no material is applied) or additional boundaries, use the *Area Feature*. See the *AgGPS FmX Integrated Display User Guide*.

Information tab

The information tab on the bottom left of the Run screen shows the Tru Application Control row and sensor details. To view row details, tap the arrow button on the side of rows:

The *Information* tab has three main views:

View	Description																
	Accessory Sensors - shows up to 6 optional sensors and implement section overview.																
	Row Sensors - shows individual population or blockage sensor status: <table border="1" data-bbox="414 802 669 1253"> <tbody> <tr> <td>1</td> <td>Row is off by clutch</td> </tr> <tr> <td>2</td> <td>Row is off by channel</td> </tr> <tr> <td>3</td> <td>Row is blocked or failed</td> </tr> <tr> <td>4</td> <td>Row is operating (slightly below the target rate line)</td> </tr> <tr> <td>5</td> <td>Row is operating (slightly above the target rate line)</td> </tr> <tr> <td>6</td> <td>Row is passive (master switch is off)</td> </tr> <tr> <td>7</td> <td>Row is operating (but below the acceptable bounds)</td> </tr> <tr> <td>8</td> <td>Row is operating (but above the acceptable bounds)</td> </tr> </tbody> </table>	1	Row is off by clutch	2	Row is off by channel	3	Row is blocked or failed	4	Row is operating (slightly below the target rate line)	5	Row is operating (slightly above the target rate line)	6	Row is passive (master switch is off)	7	Row is operating (but below the acceptable bounds)	8	Row is operating (but above the acceptable bounds)
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	Section Control Override - allows the operator to temporality override automatic section control.																



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