USER GUIDE

*Ag*GPS® TrueTracker™ Implement Steering System

Version 1.00
Revision A
Part Number 54065-30-E03
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Trimble®

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5521 DZ Eersel, NL

Safety

In this chapter:

Always follow the instructions that accompany a Warning. The information they provide is intended to minimize the risk of personal injury and/or damage to property. In particular, observe safety instructions that are presented in the following format:

WARNING – This alert warns of a potential hazard which, if not avoided, can cause severe injury.

Note – *An absence of specific alerts does not mean that there are no safety risks involved.*

Warnings

WARNING – During the Implement Automatic Deadzone calibration, the system moves the wheels that steer the implement. To avoid injury, ensure the area around the vehicle and implement is clear.

Contents

CHAPTER

1

Introduction

In this chapter:

Welcome

This manual describes how to configure and use the Trimble® *Ag*GPS® TrueTracker™ implement steering system.

Even if you have used other Global Positioning System (GPS) products before, Trimble recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GPS, visit the Trimble website (www.trimble.com) for an interactive look at Trimble and GPS.

About the product

The *Ag*GPS TrueTracker implement steering system is an upgrade for the *Ag*GPS Autopilot™ automated steering system. It increases the accuracy of implements by providing separate guidance for the implement in addition to vehicle guidance.

The system is comprised of two parts:

- Additional hardware installed on the implement
- Upgraded software for the *Ag*GPS FieldManager™ display

It extends the sub-inch, year-to-year repeatable accuracy of the *Ag*GPS Autopilot™ automated steering system to the implement.

Technical assistance

If you have a problem and cannot find the information you need in the product documentation, ***contact your local reseller*** or visit www.autopilotgps.com.

Technical Support

If you need to contact Trimble Technical Support:

1. Go to the Trimble website (www.trimble.com).
2. Click the **Support** button at the top of the screen. The Support A–Z list of products appears.
3. Scroll to the bottom of the list.
4. Click the **submit an inquiry** link. A form appears.
5. Complete the form and then click **Send**.

Alternatively, you can send an email to trimble_support@trimble.com

Your comments

Your feedback about the supporting documentation helps us to improve it with each revision. Email your comments to ReaderFeedback@trimble.com.

CHAPTER

2

Introduction to Implement Steering

In this chapter:

This chapter describes the principles and terminology of implement steering.

Terminology

The term ***implement steering*** refers to the ability to actively steer the implement that a vehicle is towing.

Normally, it is not possible to tell the exact location of the implement. When you use the *Ag*GPS FieldManager display with the *Ag*GPS Autopilot automated steering system for sub-inch accuracy, the GPS antenna and receiver are mounted on the vehicle, and it is the vehicle that is guided.

On flat ground the implement will probably be directly behind the vehicle, but in the following conditions the implement can pull (***draft***) to one side:

- on side slopes
- in variable soil conditions
- on curved guidance patterns

The stand-alone *Ag*GPS Autopilot automated steering system has no way to detect or correct for implement draft.

Figure 2.1 Vehicle with implement on a slope

In these conditions, the draft distance can be significant enough to lose repeatability for successive field operations despite the ±25 mm (±1 inch) accuracy of the tractor equipped with the *Ag*GPS Autopilot system.

Benefits of the *Ag*GPS TrueTracker system

The *Ag*GPS TrueTracker implement steering system is an optional upgrade for the *Ag*GPS Autopilot system. It requires an additional *Ag*GPS Autopilot controller and *Ag*GPS 252 receiver on the implement which report the position of the implement. Using T3 inertial terrain compensation technology and the accuracy of the *Ag*GPS 252 receiver, the TrueTracker system is able to steer the implement, ensuring it remains online behind the vehicle even on extremely sloped ground.

The TrueTracker system supports the following:

- Steering in reverse
- Straight and curved guidance patterns
- Independent implement offset
- Independent aggressiveness control for the implement

Requirements of the *Ag*GPS TrueTracker system

The TrueTracker system requires:

- An *Ag*GPS Autopilot system with the FieldManager display (firmware version 3.00)
- An unlock code for the FieldManager display implement steering functionality
- An Orthman 2, 3, 4, or 6 blade Tracker IV implement guidance system

CHAPTER

3

Configuring Implement Steering

In this chapter:

This chapter describes how to configure the *Ag*GPS TrueTracker implement steering system.

There are six steps to configuring the TrueTracker system:

1. Activate the implement steering upgrade.
2. Enable the implement controller.
3. Configure the implement controller.
4. Configure the GPS receiver on the implement.
5. Configure the implement.
6. Calibrating the implement. See Chapter 4, Calibrate the Implement.

These steps are described in more detail below.

Step 1. Activating the TrueTracker system

Before you can use the TrueTracker system, you must activate it on the *Ag*GPS FieldManager display.

Note – *This process requires you to enter the activation password. If you do not have an activation password, contact your local Trimble reseller.*

There are two ways to activate the system:

Option 1. Activating automatically via a text file

Note – *This method of activating the system is quicker than the manual method.*

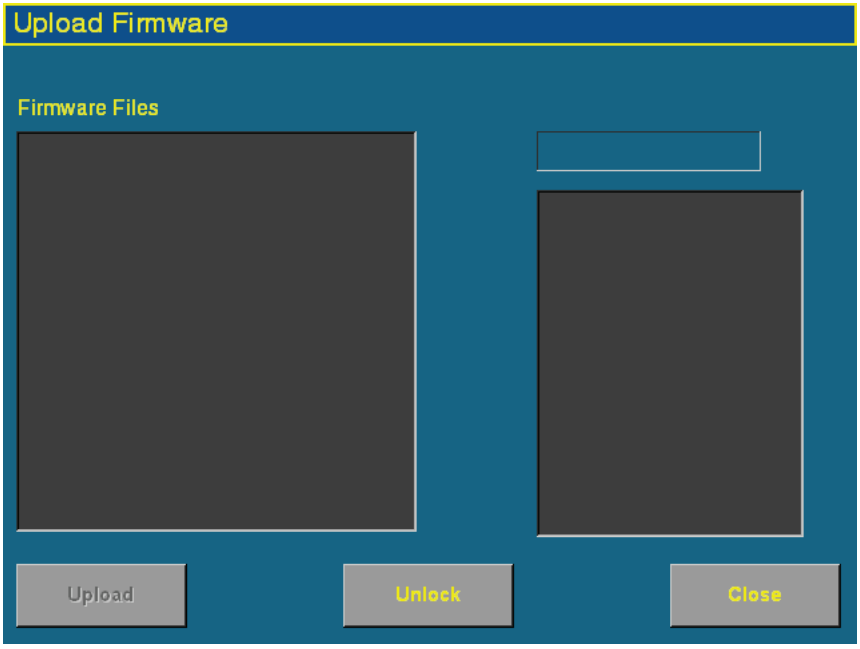
When you purchase the TrueTracker system, your local Trimble reseller provides you with a text file containing a password.

1. Insert the CompactFlash card from the *Ag*GPS FieldManager display into a card reader that is attached to an office computer.
2. Copy the password text file from the office computer into the */Firmware/* folder on the card.

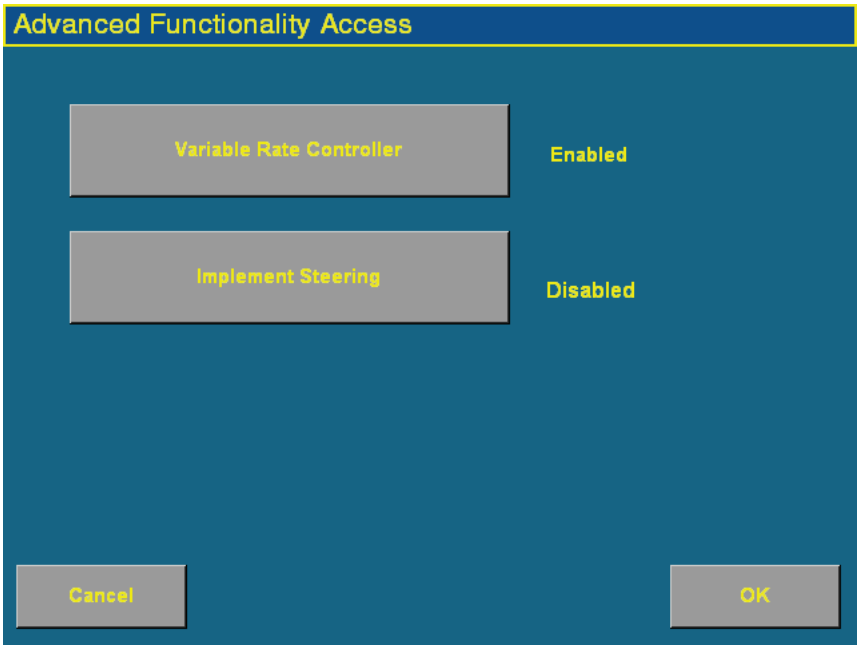
When you next insert the CompactFlash card in the display and turn the display on, implement steering is automatically activated.

Option 2. Activating manually via the display

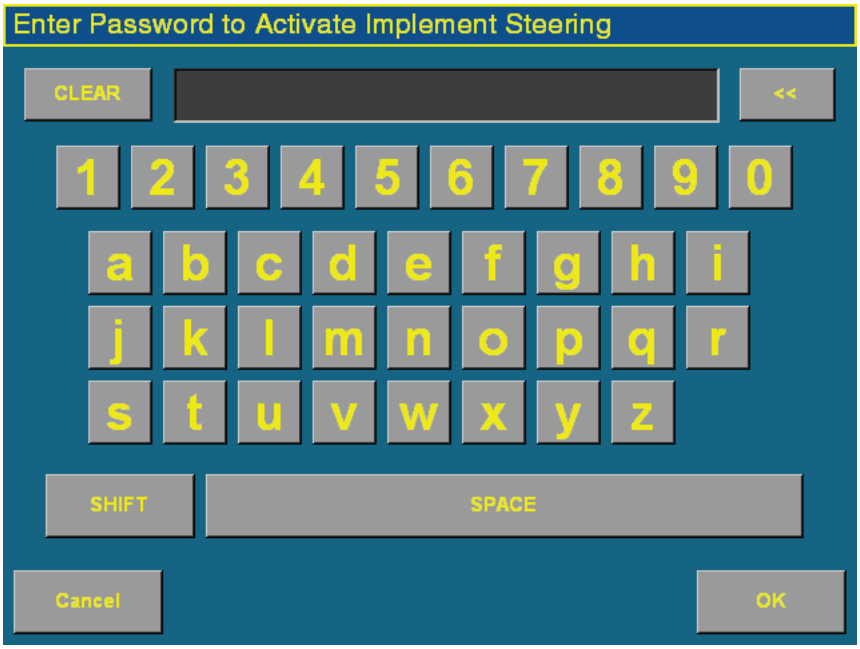
1. Turn on the display. The Home screen appears.
2. Tap the **Upgrade** button. The *Upload Firmware* screen appears.



3. Tap the **Unlock** button. The *Advanced Functionality Access* screen appears.



4. Tap the **Implement Steering** button. The *Enter Password to Activate Implement Steering* screen appears.



5. Enter the activation password that your local Trimble reseller gave to you and then tap the **OK** button.

   – If you enter a correct password, the following message appears:

   Enabled.

   Implement steering is now activated.

   – If you enter an invalid password, the following message appears:

   Your password is not valid for Implement Steering.

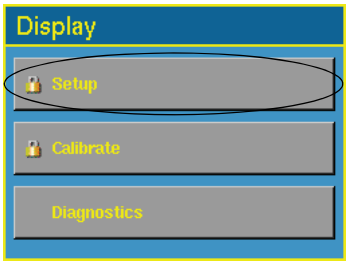
   Try entering the password again. If it still does not work, contact your local Trimble reseller.

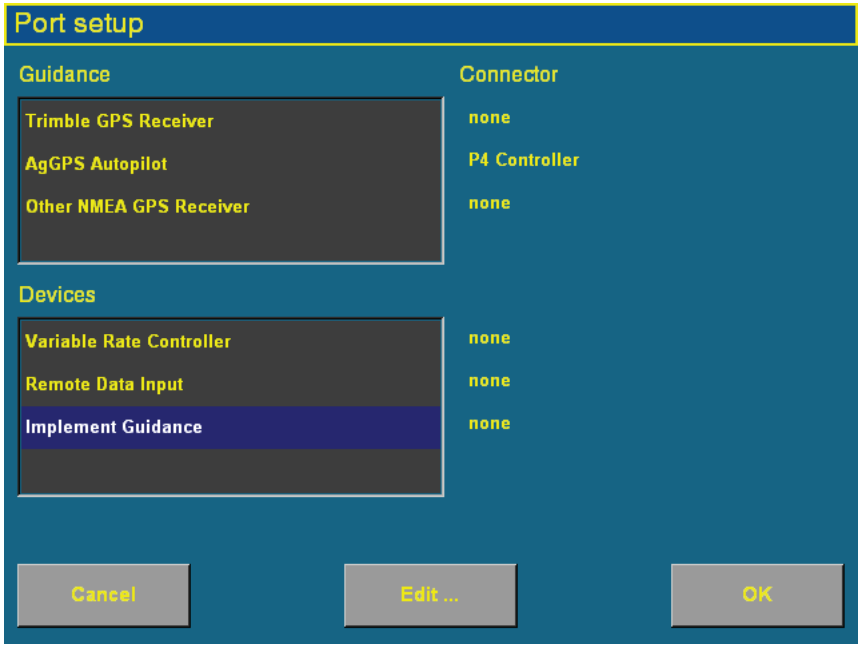
Step 2. Enabling the implement controller

1. From the *Configuration* screen, tap the **Setup** button in the Display group.

   The *Display Setup* screen appears.

2. Tap the **Ports** button. The *Port setup* screen appears.





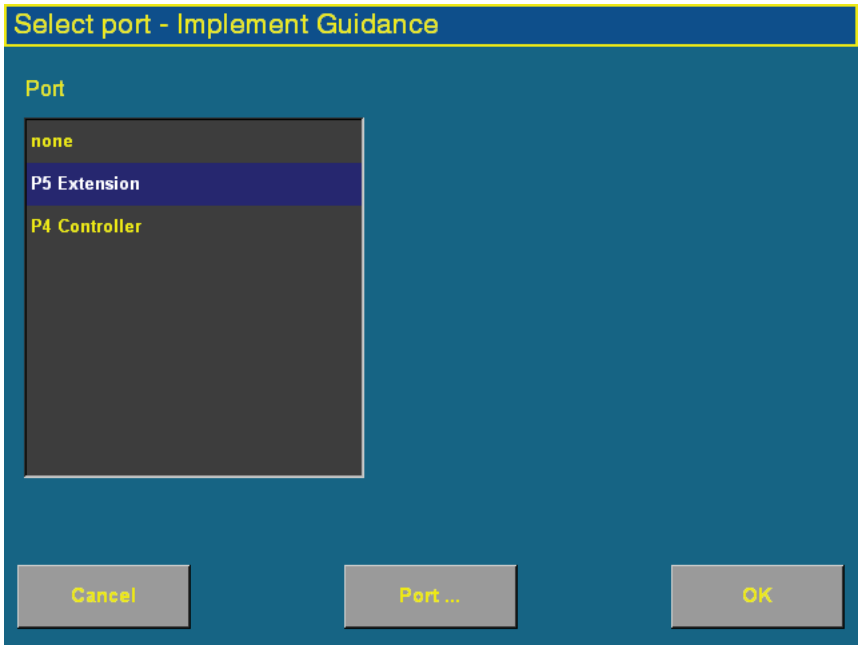
There are two configuration lists:

- Guidance
- Devices

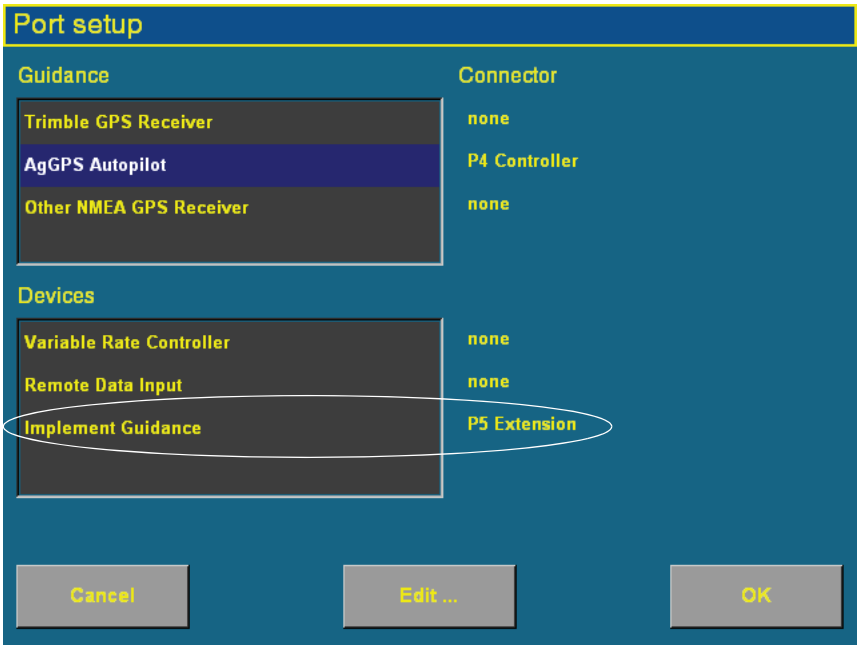
The Autopilot controller is configured in the *Guidance* list.

3. In the *Devices* list, tap Implement Guidance.

4. Tap the **Edit...** button. The *Select Port - Implement Guidance* screen appears.



5. Select P5 Extension and then tap the **OK** button. The *Port setup* screen reappears with the implement controller enabled.



Step 3. Configuring the implement controller

Your vehicle make and model were selected when your *Ag*GPS TrueTracker system was installed. Ensure that the implement make and model that are displayed are correct. If they are correct, skip this step and proceed to Step 4. Configuring the GPS receiver on the implement, page 28. Otherwise, configure the implement controller as described here.

Note – *When you configure the implement make and model, the previous calibration settings are lost. If you will want to use the current vehicle settings again, save them before you proceed.*

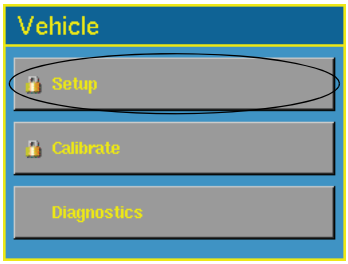
When an implement guidance controller is enabled, you can choose which controller you configure:

1. From the *Configuration* screen, tap the **Setup** button in the *Vehicle* group.

   A configuration dialog box appears.

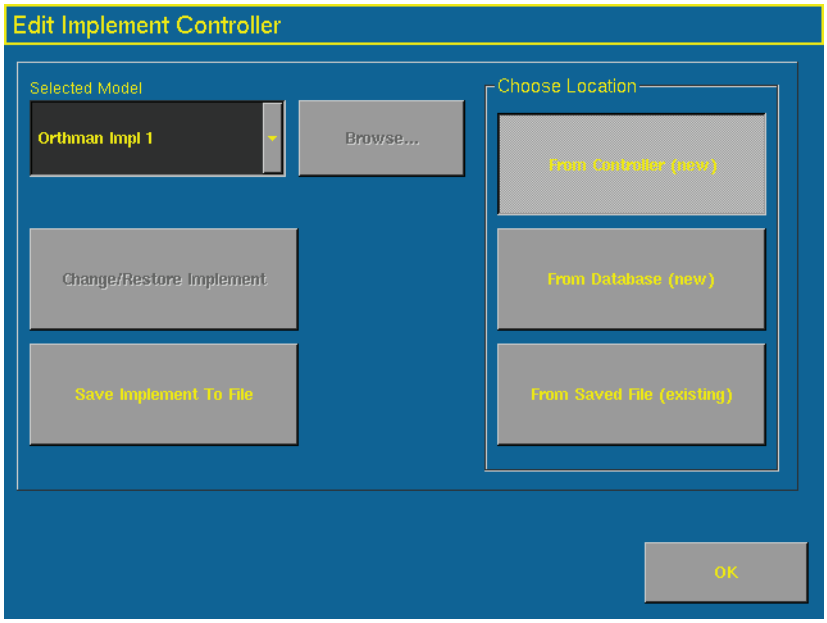
2. Tap the **Implement** button to configure the implement controller.

   The *Vehicle Setup* screen appears.



Configuring the implement make and model

1. Tap the **Edit...** button in the *Vehicle Settings* group. The *Edit Vehicle* screen appears.



2. In the *Choose Location* group, select the source that you will select the make and model from.

Tap this button...	To...	Complete step...
From Controller (new)	Select a new make and model from the list that is in the *Ag*GPS Autopilot controller firmware.	4
From Database (new)	Select a new make and model from a database of vehicles (.vdb) on the *Ag*GPS FieldManager display CompactFlash card. If you need to obtain a .vdb file, contact your local reseller.	5
From Saved File (existing)	Select an existing vehicle from a previously saved file (.cfg) on the card.	6

3. To select from the list on the implement controller:
   a. Tap the **From Controller (new)** button.
   b. Tap the Selected Model drop-down box and then select the make and model that you require from the list.
   c. Select *Orthman Imp 1* for a Tracker III or Tracker IV system.
4. To select from a database on the display card:
   a. Tap the **From Database (new)** button.
   b. Tap the **Browse** button.
   c. Select the .vdb file that you want to open and then tap the **Open** button.
5. To select a saved vehicle make and model from the card:
   a. Tap the **From Saved File (existing)** button.
   b. Tap the **Browse** button.
   c. Select the file that you require and then tap the **Open** button.
6. Tap the **Change/Restore Vehicle** button. The following message appears:

   The specified vehicle model will now be selected on the Autopilot controller. This will cause the Autopilot controller to be reset. Do you want to continue?
7. Tap the **OK** button to load the new configuration, or **Cancel** to abort.

   A dialog with the message Upload completed appears.
8. Tap **OK**.

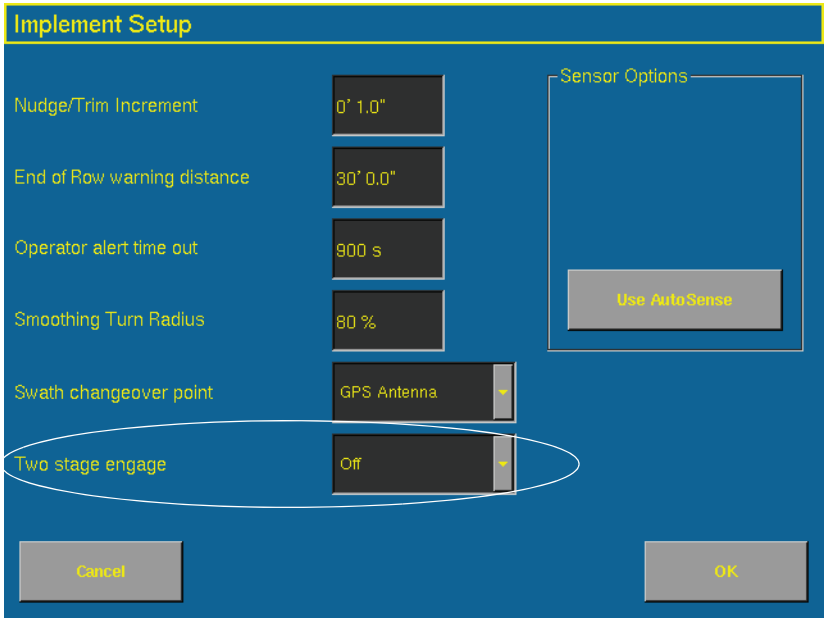
   Warning text appears. The file is now loaded.

Configuring the Engage button

The Engage button can be set to work in two different ways. See Engage button, page 63.

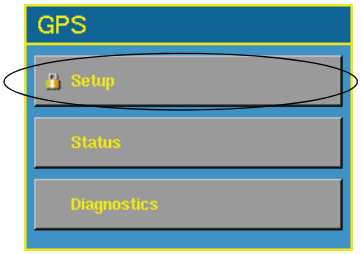
In the *Two stage engage* list, select the appropriate option:

Item	Description
On	The **Engage** button requires multiple taps to engage: – The first tap engages implement steering – The second tap engages the vehicle steering – The third tap disengages automated steering
Off	The **Engage** button engages with one tap: – The first tap engages implement and vehicle steering – The second tap disengages automated steering

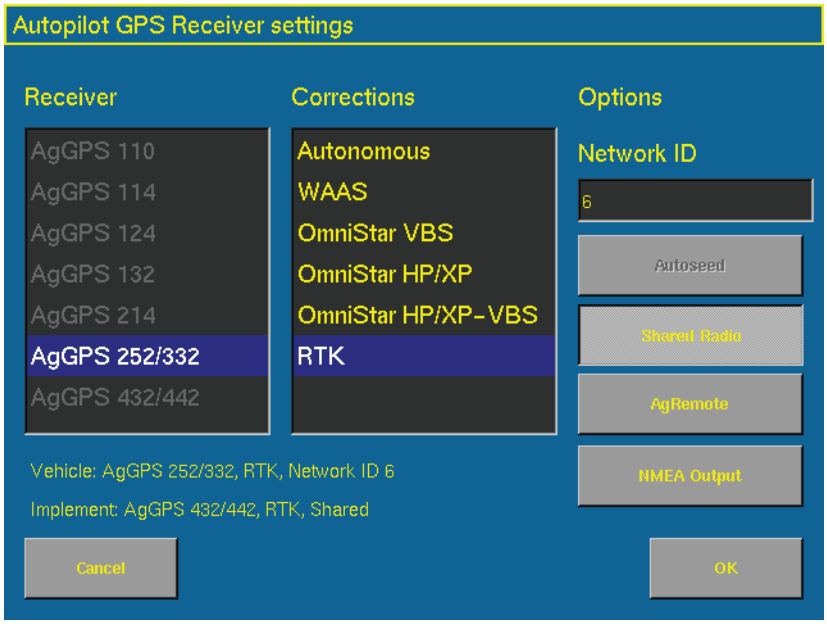


Step 4. Configuring the GPS receiver on the implement

To verify the settings, tap the **Setup** button in the *GPS* group.



The *Autopilot GPS Receiver settings* screen appears.



If your GPS receivers share a radio, tap the **Shared Radio** button.

Any changes made in this screen apply to both GPS receivers.

The two status lines at the bottom of the screen confirm the Vehicle and Implement settings.

Step 5. Configuring the implement

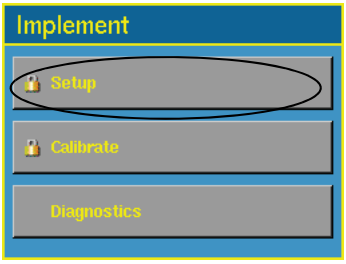
Configure an implement so the system can tell:

- which type of implement is attached
- how much area it covers
- how far offset it is

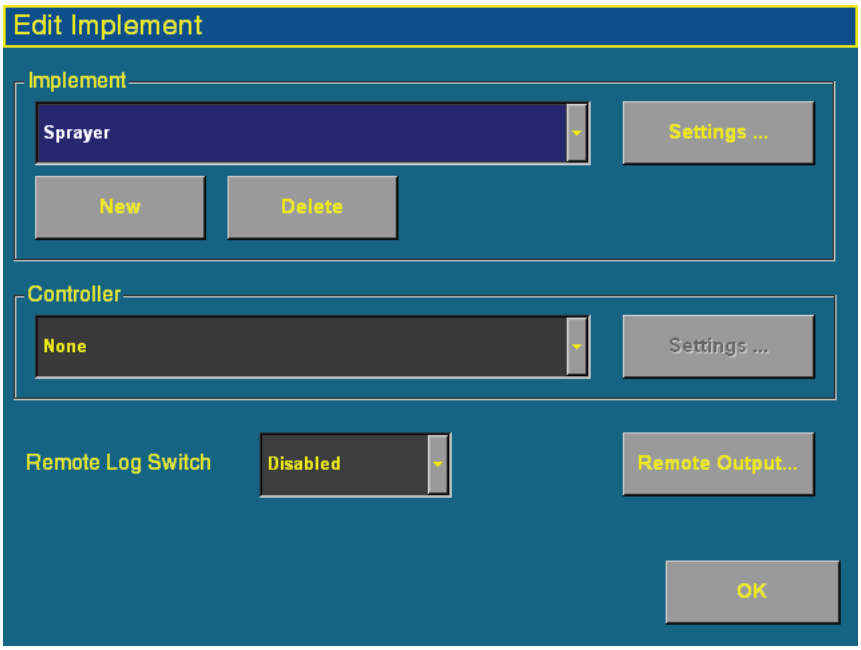
To load or import an existing implement, see page 35.

To configure an implement:

1. From the *Configuration* screen, tap the **Setup** button in the *Implement* group.



   The *Edit Implement* screen appears.

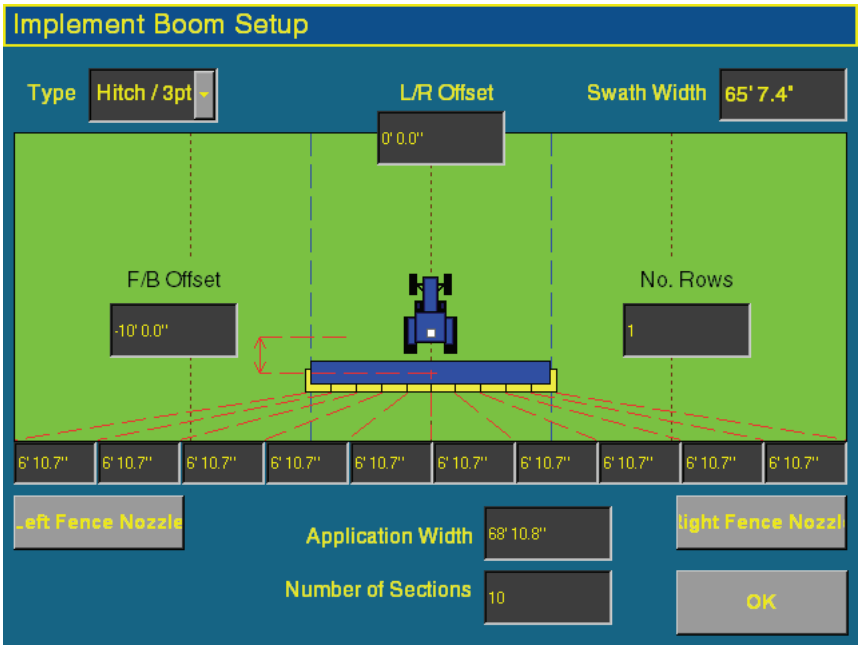


Any previously configured implements appear in the *Implement* drop-down list at the top of the screen.

If there is only one available implement, it is selected by default.

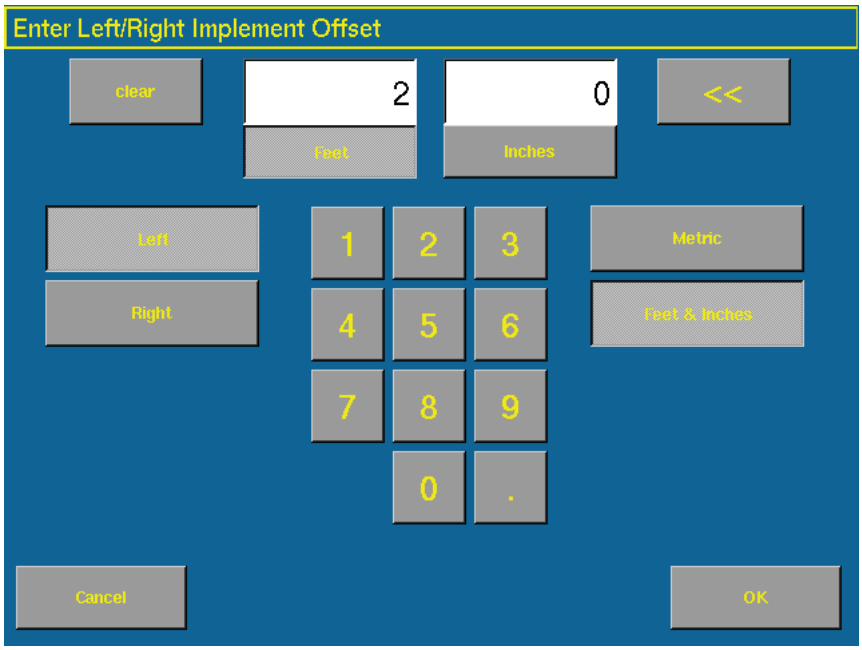
2. Do one of the following:
   - Create a new implement, see page 34.
   - Import an implement, see page 35.
   - Select an existing implement from the drop-down list. See below.
3. Tap the **Settings ...** button.

   The *Implement Boom Setup* screen appears.



4. If the implement boom is offset to one side, set the left/right offset:

   a. Tap the *L/R Offset* text box. The *Enter Left/Right Implement Offset* screen appears.



   b. Tap either the **Metric** or the **Feet & Inches** button to select the units that the offset is measured in.

   c. Enter the offset distance.

   d. Tap either the **Left** or the **Right** button to select the direction of the offset. An offset to the left indicates the implement extends to the left of the driver when seated in the vehicle.

   e. Tap the **OK** button.

      The *Implement Boom Setup* screen appears. The image of the vehicle will show the offset you have just set.

5. If the implement boom is offset forward of or behind the location of the antenna, set the front/back offset:

   a. Tap the **F/B Offset** button. The *Enter Front/Back Offset* screen appears.

   b. If necessary, tap either the **Metric** or the **Feet & Inches** button to change the units that the offset is measured in.

   c. Enter the offset distance.

   d. Tap either the **Back** or the **Forward** button to select the direction of the offset. A forward offset indicates that the implement is located ahead of the vehicle antenna position.

   e. Tap the **OK** button.

      The *Implement Boom Setup* screen appears. The image of the vehicle will show the offset you have just set.

Note – *The screen is scaled to whichever is larger, the swath or application width. This can mean that if any offset is greater than this, the tractor image can pass the edge of the screen.*

6. Tap the *No. Rows* text box to enter the number of rows that span across the boom, which are used for navigation.

   Note – *When you press the Skip button to adjust the guidance line, the guidance line can move across by rows.*

7. Enter the number of implement sections:

   Note – *If the implement does not have sections, enter* **1**.

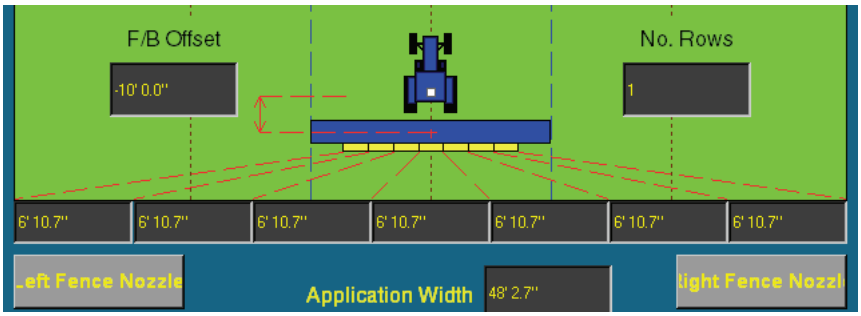
   a. Tap the *Number of Sections* text box.

      The *Enter Number of Sections* screen appears.

   b. Enter the number of boom sections and then tap **OK**.

      Note – *Do not include fence sections when you count the total number of sections.*

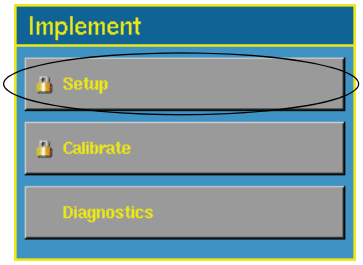
      The *Implement Boom Setup* screen appears. The graphic and the number of buttons along the base of the graphic will show the new number of sections.



8. Tap the *Application Width* text box and then enter the distance from one end of the spray boom to the other. When you return to the *Implement Boom Setup* screen, the graphic will show the new application width.

9. Tap each of the numbered buttons (under the graphic) to set the boom section widths. By default, each section width is set to an equal amount (calculated by dividing the application width by the number of sections).
10. Change the *Swath Width* text box, if necessary. To create an overlap, set the Application Width to slightly more than the Swath Width.
11. Tap **OK**. The *Edit Implement* screen appears.

Creating an implement



1. From the *Configuration* screen, tap the **Setup** button in the *Implement* group. The *Edit Implement* screen appears.
2. Tap the **New** button. The virtual keyboard appears.
3. Enter a name for the new implement and then tap **OK**.

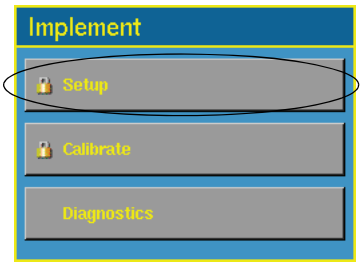
   The *Edit Implement* screen appears.
4. Tap the **Settings...** button.

Importing an implement from the *Ag*GPS 170 Field Computer

The *Ag*GPS FieldManager display can import and use implements that were created in the *Ag*GPS 170 Field Computer:

1. From the *Configuration* screen, tap the **Setup** button in the *Implement* group.

   The *Edit Implement* screen appears.



2. Tap the **Import** button.

   Note – *The* ***Import*** *button is only available when there is an implement from an AgGPS 170 Field Computer in the \AgGPS\ directory on the CompactFlash card.*

   The implements from your *Ag*GPS 170 Field Computer now appear in the *Implement* list.

CHAPTER

4

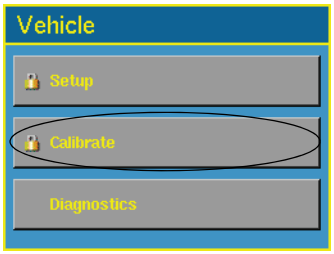
Calibrate the Implement

In this chapter:

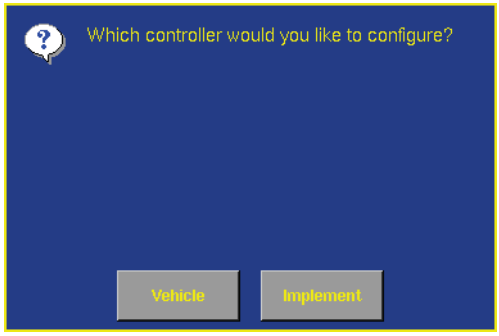
This chapter describes how to select the implement controller and then calibrate the implement.

Calibrating the implement

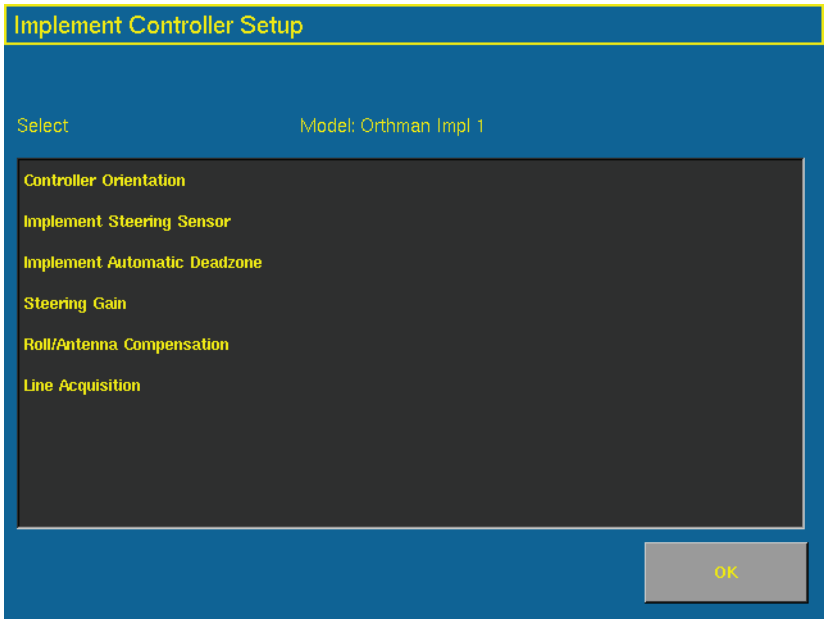
1. From the *Configuration* screen, tap the **Calibrate** button in the *Vehicle* group.



A calibration dialog box appears.



2. Tap the **Implement** button to configure the implement. The *Implement Controller Setup* screen appears.

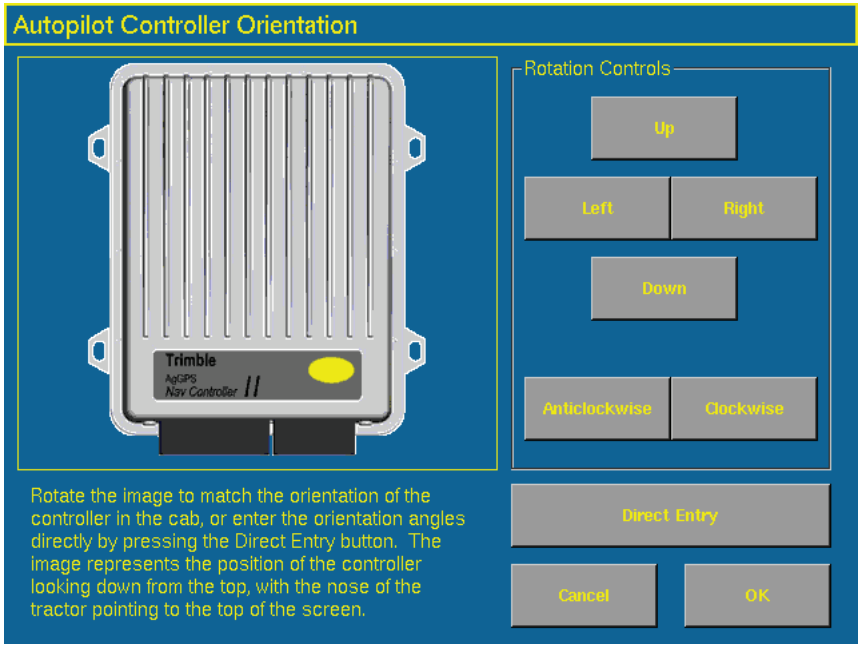


3. Select an item to configure and tap **OK**.
4. Configure the selected item.

To configure ...	See page ...
Controller orientation	page 40
Steering sensor	page 41
Automated steering deadzone	page 42
Steering gain	page 46
Roll/antenna correction	page 54
Line acquisition	page 58

Configuring the controller orientation

1. Select the *Controller Orientation* option from the list. The *Autopilot Controller Orientation* screen appears.



   An image represents the current mounting orientation of the controller.

   The image is shown as though:

   – You are looking down on the vehicle from above.

   – The top of the screen points to the nose of the vehicle.

2. Use the buttons to select the orientation of the controller.

   If the controller is set at a sloped angle, tap the **Direct Entry** button and then enter the yaw, pitch, and roll angles of the controller.

   Note – *If you use the Direct Entry method to set custom angles, the onscreen image of the controller will not be displayed.*

3. Tap **OK** to accept the new orientation, or **Cancel** to exit.

Calibrating the Implement Steering Sensor

Perform steering sensor calibration to convert the voltage output of the steering sensor into an equivalent steering angle measurement.

Note – *Complete this calibration before you attempt to calibrate the steering deadzone or roll correction procedures.*

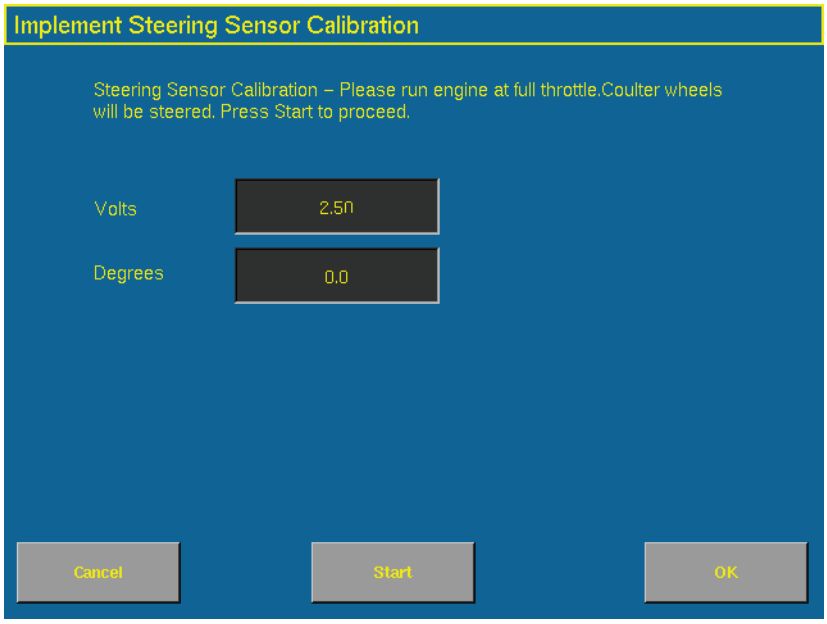
This calibration requires the vehicle to be in motion. Ensure that you:

- perform this procedure on a hard, level surface that is free of obstructions.
- follow the instructions presented on each page.
- run the engine at full throttle.
- raise the implement.

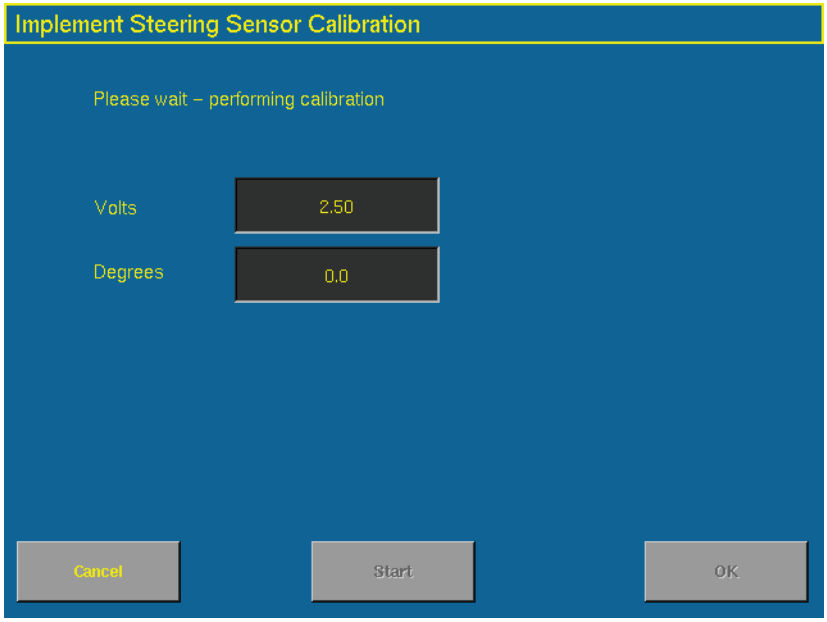
To run the steering sensor calibration:

1. Select the *Steering Angle* procedure from the calibration list.

   The first *Implement Steering Sensor Calibration* screen appears.



2. Move the tractor forward slowly.
3. Tap the **Start** button.



4. Perform the calibration. The value in the *Volts* field is updated as the wheels are steered.

Calibrating the Implement Automatic Deadzone

The Implement Automatic Deadzone calibration procedure runs a series of tests on the valve and steering hydraulics to determine the point at which steering movement occurs.

WARNING – During the Implement Automatic Deadzone calibration, the system moves the wheels that steer the implement. To avoid injury, ensure the area around the vehicle and implement is clear.

In this test, the system independently opens and closes each side of the steering system while determining the point at which wheel movement occurs.

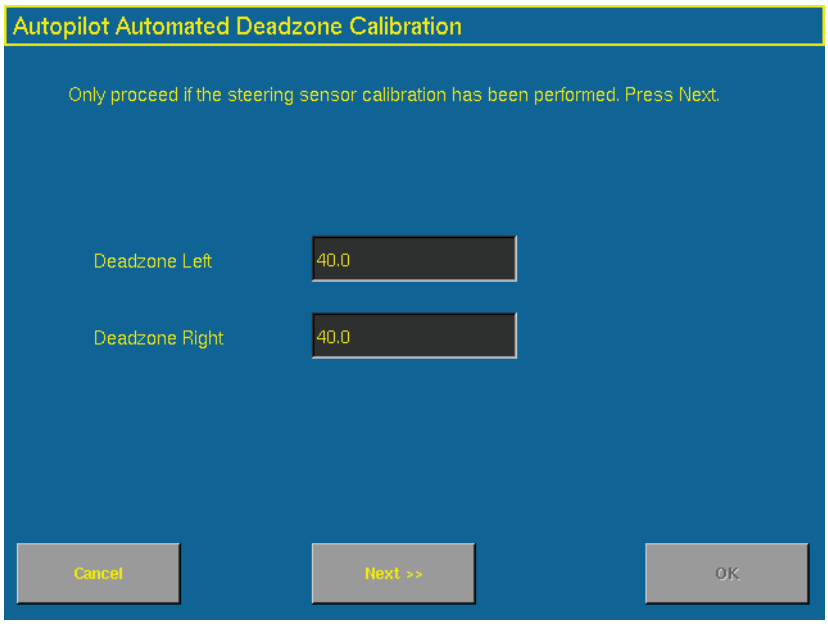
Notes on calibrating the Implement Automatic Deadzone

- You must complete the Steering Angle procedure before you run this procedure.
- To ensure optimal system performance, the hydraulic fluid must be at normal operating temperature when you run this procedure. On some vehicles with large reservoirs, it may take several hours for the fluid to reach operating level, especially if the implement circuit is lightly loaded. Consult the vehicle documentation to determine if the hydraulic fluid temperature can be displayed on a vehicle console.
- If you perform the calibration while the system is still cold, repeat both the Deadzone and the Proportional gain calibration procedures once the system is at operating temperature.

To configure the automated steering deadzone:

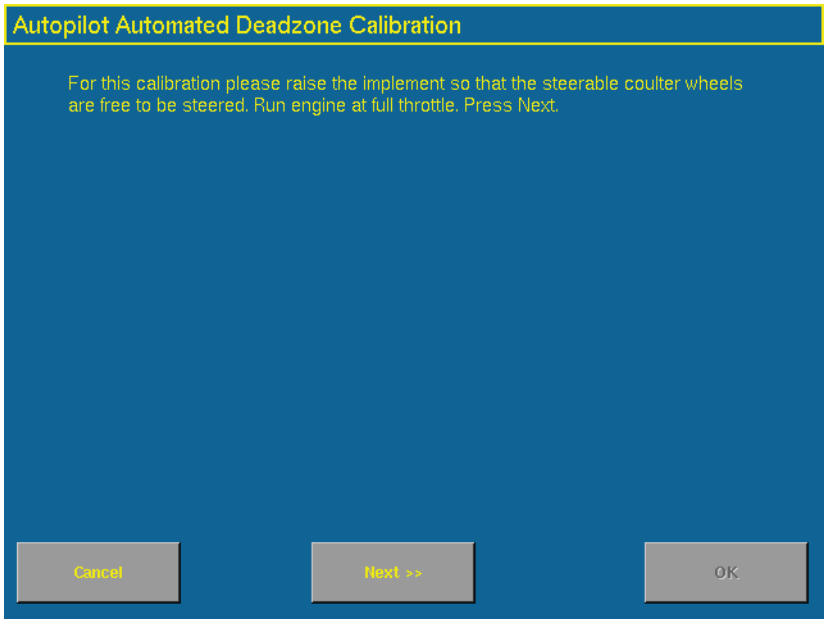
1. Place the vehicle in an area that is free of hazards.
2. Select the Implement Automatic Deadzone procedure from the calibration list. See page 42.

The *Autopilot Automated Deadzone Calibration* screen appears.



3. Tap the **Next** button to continue.

The second *Autopilot Automated Deadzone Calibration* screen appears.



4. Tap the **Next** button twice.

   Note – *Read the onscreen instructions on each page.*

   Follow the instructions. The system will automatically move the coulter wheels in both directions several times.

5. Tap the **Start** button. The system engages and performs the calibration.

Automated Deadzone error messages

If a calibration cycle is unable to complete successfully, one of the error messages below will appear:

Message	Meaning
Error - Steering Close To End Stops	Before the calibration cycle could be completed, the measured steering angle approached the end stops. Retry, and if the problem persists, instead of centering the steering at the start of each cycle, try turning the steering in the opposite direction to that which is being tested so that the calibration procedure has a greater range to test over.
Error - Valve Connectors Could Be Swapped	The calibration test sensed the steering turning in the opposite direction to what was expected. Retry, and if the problem persists either the valve connectors have been accidentally swapped or the steering sensor calibration was performed incorrectly.
Error - No GPS	A GPS receiver must be connected and outputting positions before the software can run the calibration procedure.
Error - No Steering Response Detected	During the calibration cycle, insufficient movement was sensed in order for the calibration to complete. If the problem persists, the hydraulic installation could be faulty.
Error - Unable To Determine DZ: Try Again	A problem occurred when trying to compute dead zone. Retry, and if the problem persists, contact Technical Support.

Proportional steering gain calibration

Note – *Complete the steering sensor calibration before you perform the proportional gain calibration.* ***ONLY*** *perform the proportional steering gain calibration when the TrueTracker system performance is less than satisfactory.*

The proportional steering gain (PGain) setting enables you to reach a compromise between rapid steering response and stability. Modifications to the PGain setting affect two steering characteristics:

- *Slew Time*: The amount of time the steering coulters take to move from the far left to the far right position and vice versa.
- *Overshoot*: The percentage by which the steering coulters exceed the commanded angle before they settle on the correct value.

To correct slight variations caused by valve current response, friction, and hydraulic fluid viscosity, alter these settings.

High PGain values ...	Low PGain values ...
Decrease the slew time and increase the overshoot. This provides rapid responses, but can cause the steering to exhibit signs of instability (for example, a tendency to excessively overshoot).	Increase the slew time and decrease the overshoot. This improves the stability but can introduce significant delays in the steering response and can cause the vehicle to oscillate from side to side.

Notes on performing the proportional steering gain calibration

- Perform the Automatic Deadzone calibration immediately before you run the PGain calibration, even if the Automatic Deadzone calibration has been performed in the past.
- Perform this calibration on a hard, level surface, free of obstructions.
- Run the engine at full throttle.
- Raise the implement.

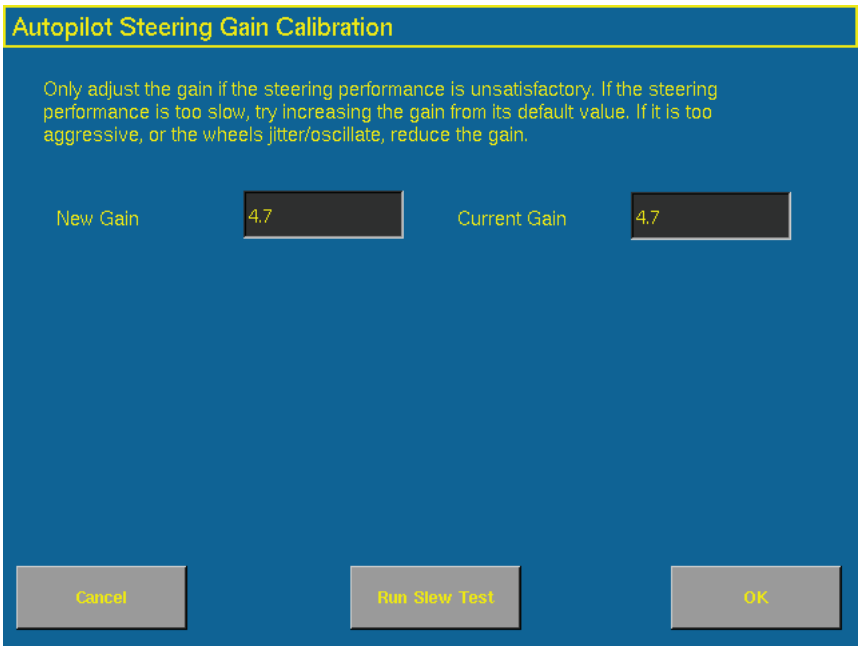
Increase the proportional gain up to the point just before any one of the following occurs:

- Slew times no longer decrease (a low value is desired)
- Overshoot exceeds 5–8 % (depending on the Tracker unit)
- Steering coulters noticeably shake near end stops

To calibrate the proportional steering gain:

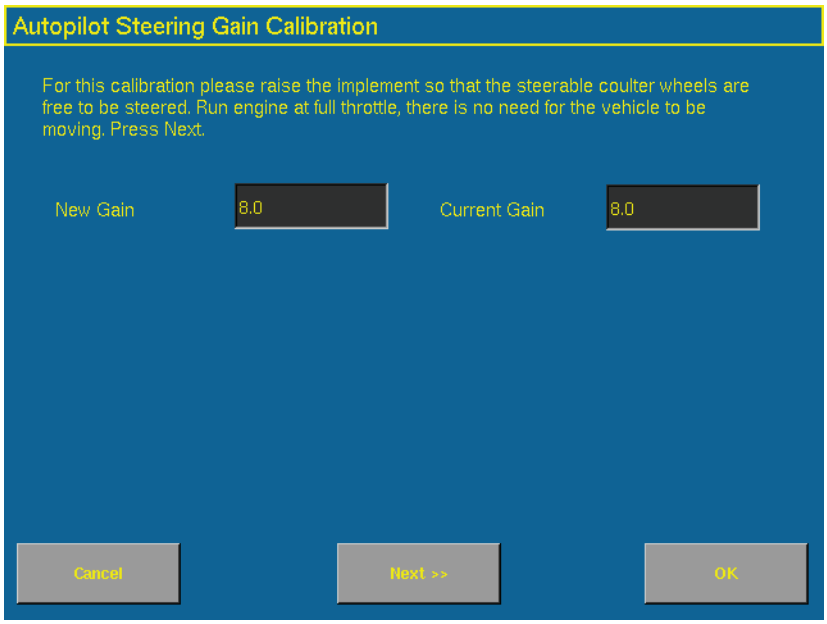
1. Select the Steering Gain procedure from the calibration list.

   The first *Implement Steering Gain Calibration* screen appears.



2. Tap the **Run Slew Test** button. A warning message appears.
3. Tap the **Next** button.

The third *Implement Steering Gain Calibration* screen appears.



CAUTION – The steering coulters can move abruptly during the Proportional Steering Gain procedure while the *Ag*GPS TrueTracker system tests the hydraulic response to the steering commands. These sudden movements can cause collisions with nearby obstacles or cause injury. Be prepared for sudden steering coulter movements.

4. Tap the **Next** button.

   The fourth *Implement Steering Gain Calibration* screen appears.

5. Tap the **Next** button to continue.

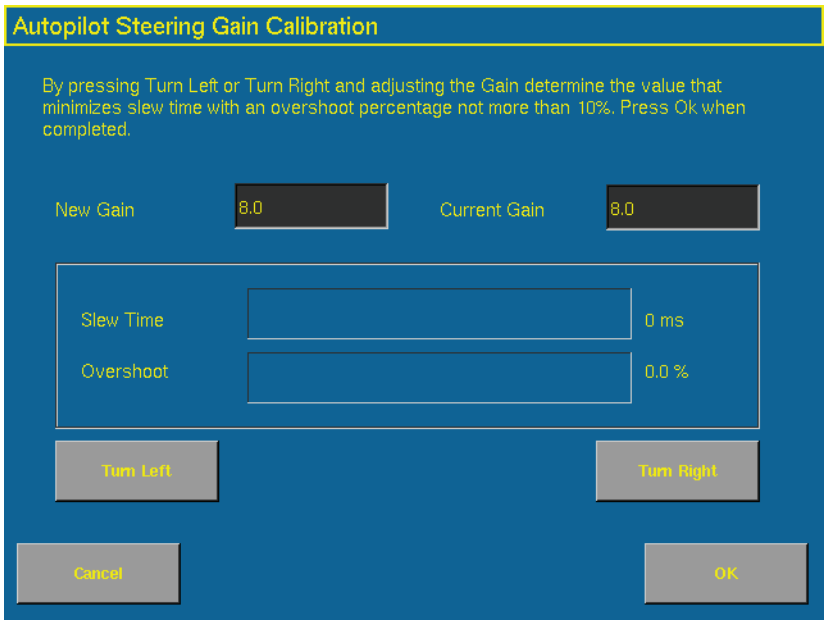
   The fifth *Implement Steering Gain Calibration* screen appears.

6. Test various gain settings while you monitor the vehicle performance and the values in the *Slew Time* and *Overshoot* fields for the Turn Left phase.

   a. Adjust the *New Gain* field (if desired).

   b. Turn the front wheels completely to the right to begin the test. (The test is for the stop-to-stop position).

   c. Tap the **Turn Left** button. Both turn buttons are unavailable while the wheels slew.



Note – *The optimum gain setting has short slew time (short millisecond reading) and overshoot percentage less than 10%.*

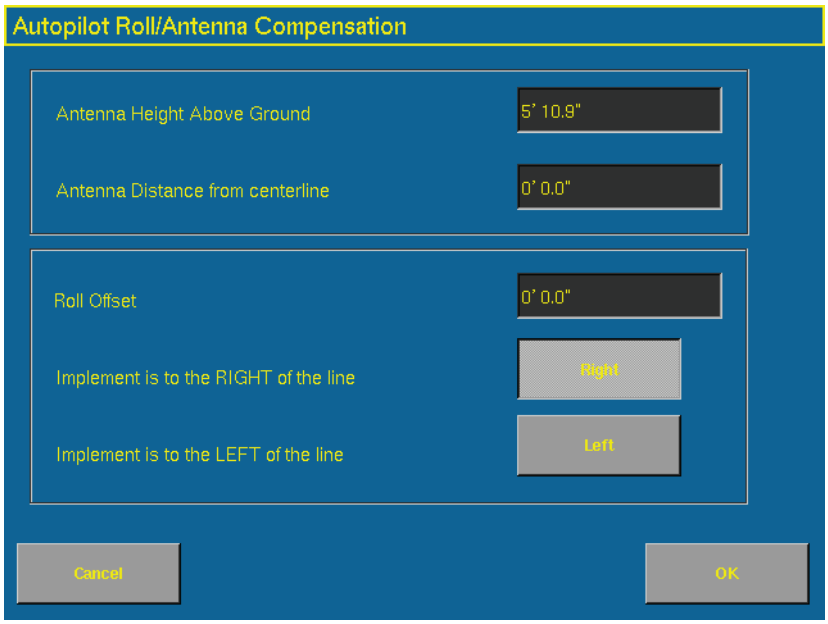
7. Repeat Step 5 with the **Turn Right** button. Both turn buttons will be grayed out while the wheels slew.

8. When you locate the best gain value:
   - Tap the **OK** button to save the value in the *Ag*GPS Autopilot controller memory.
   - Tap the **Cancel** button to restart the calibration procedure.

Configuring the antenna position and roll offset correction

1. Select *Roll/Antenna Compensation* from the calibration list.

   The *Autopilot Roll/Antenna Compensation* screen appears.



2. Before changing these settings, complete the procedures described below.

Notes on configuring the antenna position

- Before configuring the antenna compensation, make sure that:
  - the *Ag*GPS TrueTracker system is completely set up
  - the Autopilot software is properly configured
  - the correct GPS corrections are enabled

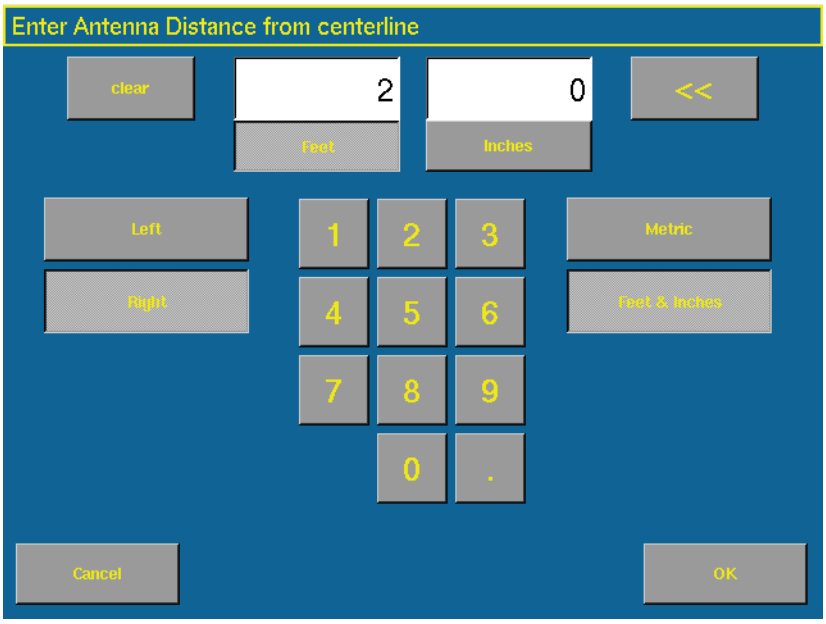
  Read this section carefully before you attempt the configuration.
- If multiple GPS technologies will be used (for example, RTK and WAAS), use the technology with the highest accuracy when you perform the Roll Correction calibration.

1. Setting the antenna height above the ground

1. Place the tractor on a flat, level surface.
2. Measure the distance from the ground to the base of the GPS receiver (or antenna).
3. Enter this value in the *Antenna Height Above Ground* field.

2. Setting the antenna distance from the centerline

1. Place the tractor and implement on a flat, level surface.
2. Measure the distance from the centerline of the implement to the center of the GPS receiver (or antenna).



3. Enter this value into the *Antenna Distance from centerline* field and indicate whether it is left or right of the centerline. Values to the left of the centerline are displayed as negative numbers. The nose of the vehicle is considered the forward direction.

3. Configuring the roll offset correction

Use one of the following methods to calculate the roll offset and then enter the roll offset correction to compensate for it:

- Tire track offset method
- Flag offset method

Choose the method which best matches the conditions.

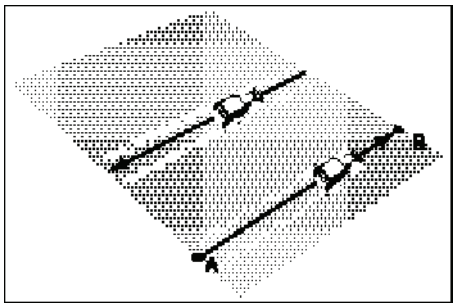
Calculating the roll offset: coulter wheel track offset method

Tip – Trimble recommends that you use a highly repeatable GPS correction mode for roll correction. For best results, use a RTK mode or OmniSTAR HP signal that has been converged for at least twenty minutes. If you do a roll calibration with less accurate GPS correction modes, repeat the measurements ***at least four times*** to ensure a more consistent result.

1. Drive the tractor to a relatively flat field where tire impressions are visible and where you can complete passes of at least 402 m (1320 ft) in length.
2. Reset the roll offset value to 0 (zero).
3. Start a new field.
4. Create a straight AB Line.
5. Create a clean set of tire tracks in the field. To do this, start a new pass away from the area where the AB Line was created. When the system is stable, engage automatic steering mode and allow the *Ag*GPS Autopilot and TrueTracker systems to complete the pass.
6. At the end of the pass, turn the tractor around to return along the same pass from the opposite direction.
7. Engage automated steering mode and allow the system to complete the pass.
8. At the end of the return pass, stop the tractor and confirm that the current position is directly on the AB Line. This ensures there is no cross track error.
9. Park the tractor and exit the cab. Evaluate the coulter wheel track pattern between the first and return paths.
10. Measure the difference between the track passes and record the distance in inches. Also note whether the return pass is to the left or the right of the original pass. Record the results in Table 4.1 on page 57.

Note – *The offset should be consistently to the left or right.*

11. Repeat Steps 5 to 10 two more times, for a total of three test runs. Use Table 4.1 on page 57 to record the offset distance in inches and the left or right direction of offset for each test run.



Calculating the roll offset: flag offset method

1. Drive the vehicle to a relatively flat area where you can complete passes that are at least 402 m (1320 ft) in length.
2. Reset the *Roll Offset* value to 0 (zero) on the *Roll Correction* screen. See 3. Configuring the roll offset correction, page 53.
3. Start a new field.
4. Create a straight AB Line.
5. Start a new pass. Engage automatic steering mode when the system is stable. Stop the tractor midway through the pass. Confirm that there is no cross track error: the current vehicle position should be directly on the AB Line.
6. Park the vehicle and exit the cab. Insert a flag in the ground to mark the implement centerline for this pass.
7. Complete the pass. Turn the vehicle around to return along the same pass from the opposite direction.

8. Engage automatic steering mode. Stop the vehicle midway down the pass very close to the marker flag. Confirm that there is no cross track error: the current vehicle position should be directly on the AB Line.
9. Park the vehicle and exit the cab. Insert a second flag in the ground to mark the implement centerline for this pass. Note whether the second pass is to the left or the right of the first pass.
10. Measure the difference between the flags for the two passes and record the distance ***in inches***. Also record whether the return pass is to the left or the right of the original pass. Record the results in Table 4.1 on page 57.

    Note – *The offset should be consistently to the left or right.*

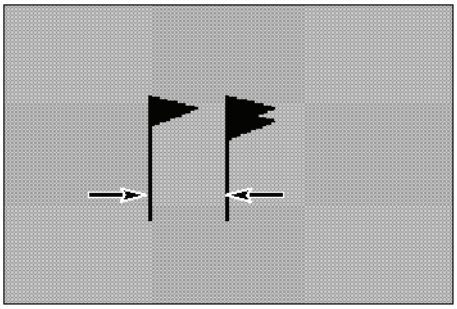


Figure 4.1 Right offset: Measure the distance between the flags

11. Repeat Steps 5 to 10 two more times for a total of three test runs. Use Table 4.1 on page 57 to record the offset distance in ***inches*** and the left or right direction of offset for each test run.
12. Average the results of the three runs. (Total the offset distances from the three passes and divide by three).

Table 4.1 Table for recording the roll correction results

Test run	Offset distance (Inches)	Offset direction
1		
2		
3		
	Total =	
	Total/3 = (Average offset value)	

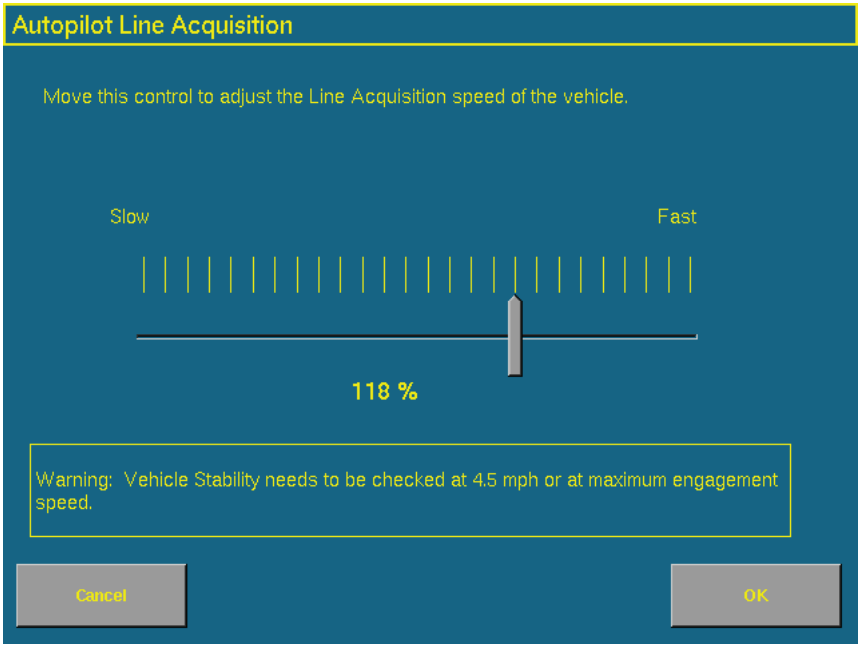
Entering the roll offset

1. Enter the average offset value in the *Roll Offset* field. See Configuring the antenna position and roll offset correction, page 51.
2. Select one of the offline direction options, depending on whether the roll offset distance is to the left or right.

Calibrating the line acquisition aggressiveness

1. Select *Line Acquisition* from the calibration list.

   The *Autopilot Line Acquisition* screen appears.



2. Adjust the line acquisition aggressiveness slider. The slider controls how aggressively the implement approaches the guidance line, using a scale from 50% to 150%. The optimal value for each profile is not necessarily 100%: it varies for different implement profiles.

CHAPTER

5

Implement Steering Operation

In this chapter:

This chapter describes how to use the *Ag*GPS FieldManager display to steer implements.

Main guidance screen

The FieldManager display's main guidance screen changes when implement steering is enabled.

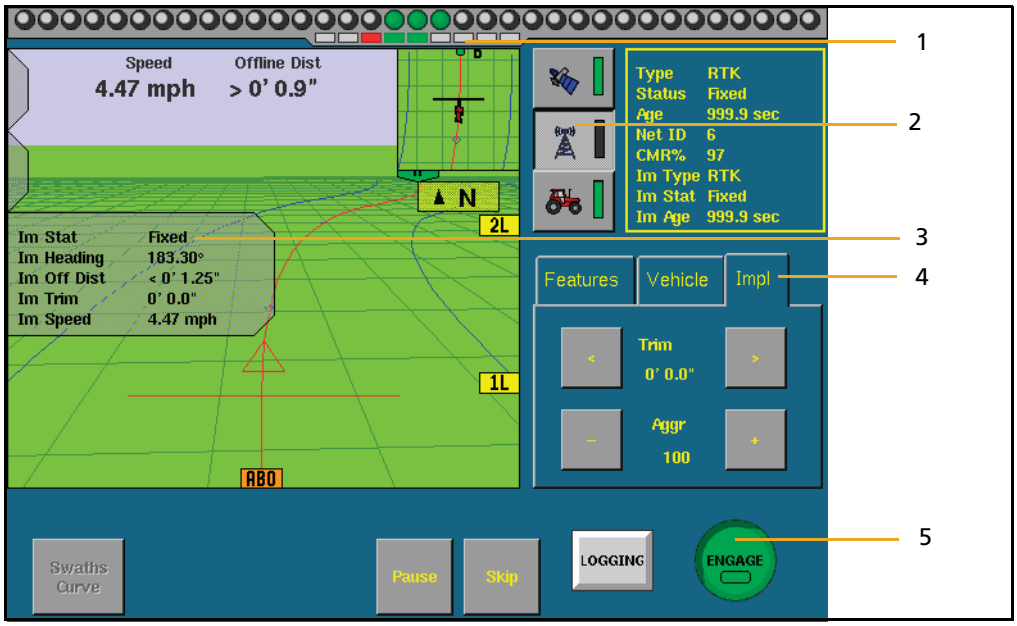


Figure 5.1 Main guidance screen with implement steering features

Item	Description
1	Implement lightbar
2	Corrections status button
3	Implement status text items
4	implement tab
5	Implement steering engage button

These new features are described in greater detail below.

Implement lightbar

When implement steering is enabled, a second, smaller lightbar appears below the main lightbar.

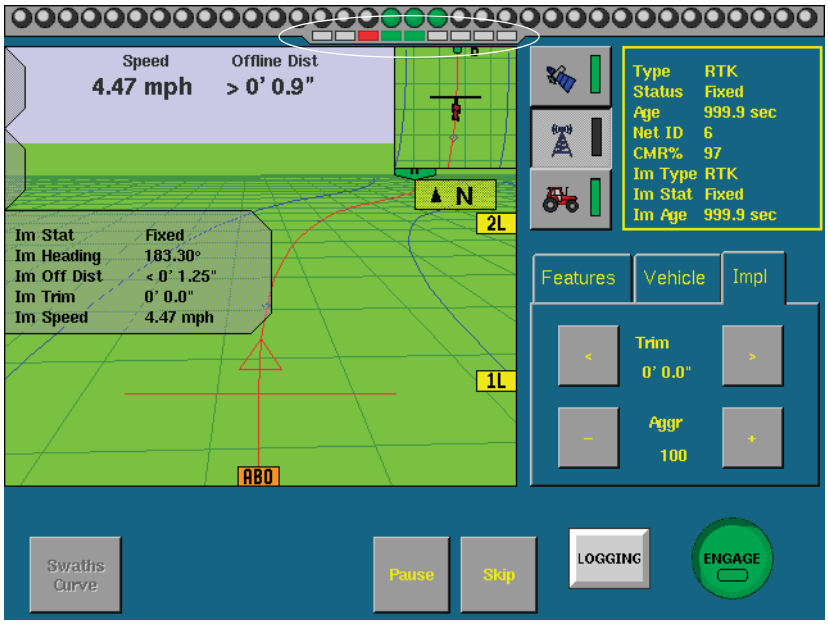


Figure 5.2 The second lightbar

This lightbar shows the implement guidance relative to the guidance line. Each LED on the second lightbar represents 1 inch.

Implement status text items

A number of status text items provide information about the implement:

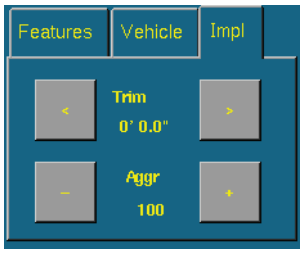
Item	Description
Implement	The name of the implement
implement GPS Status	The status of the GPS correction used for the implement
Implement Correction Type	The correction type used by the implement receiver
Implement Correction Age	The age of the corrections used by the implement controller
Implement Heading	The implement heading (in degrees)
Implement Offline Distance	The implement offline distance
Implement Offset	The implement offset
Implement Speed	The speed of the implement
Implement Trim	The amount of Trim currently applied to the implement
Implement Width	The width of the implement

These status text items can be set to appear permanently at the top of the screen or on a slide-out tab. The following items can also be viewed by tapping the corrections status button at the top right of the screen:

- Implement GPS Status
- Implement Correction Type
- Implement Correction Age

Implement tab

When implement steering is enabled, the *Impl* tab becomes available on the main run screen.



The *Impl* tab enables you to adjust the implement steering independently of the vehicle steering. For example, if you could see that the implement was consistently to one side of the guidance line but the vehicle was correctly online, you could apply Trim to the implement to correct it.

Note – *If the implement is consistently offline, there may be a roll calibration issue. Recheck the roll calibration.*

Engage button

When implement steering is enabled, the **Engage** button changes state. It has two status indicators:

- The main button color, which represents vehicle steering
- The small inner color, which represents implement steering

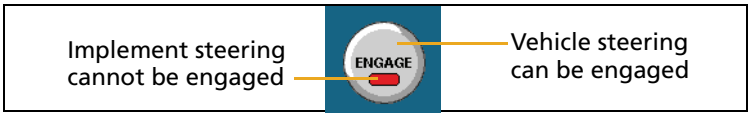


Figure 5.3 Two status indicators on the Engage button

Configuring the Engage button

The **Engage** button can be configured to work in two different ways:

Item	Description
Single press	The **Engage** button engages with one tap: – The first tap engages implement and vehicle steering – The second tap disengages automated steering
Two-stage press	The **Engage** button requires two taps to engage: – The first tap engages implement steering – The second tap engages the vehicle steering – The third tap disengages automated steering

To configure how the **Engage** button works, see Step 3. Configuring the implement controller, page 24.

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