FIRMWARE V4.00 RELEASE NOTES

EZ-Guide® Plus Lightbar Guidance System

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- ■ **Upgrade procedure**

Version 4.00
Part Number 61029-XX-ENG
Revision A
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This is the September 2006 release (Revision A) of the *EZ-Guide Plus Lightbar Guidance System Release Notes*, part number 61029-XX-ENG. It applies to version 4.00 of the EZ-Guide Plus lightbar guidance system firmware.

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Introduction

These release notes describe new features and changes in the documentation for the EZ-Guide® Plus lightbar guidance system firmware version 4.00. The release notes include features added in version 3.11 and 3.10.

Contents

These release notes contain information regarding the following:

- Major new features and enhancements
- Minor enhancements
- T2 terrain compensation technology
- Upgrade procedure

Major new features and enhancements

This section lists all the changes since the EZ-Guide Plus system firmware version 3.00. It includes features added in:

- firmware version 4.00

- firmware version 3.11

- firmware version 3.10

Enhancements to saved vehicle configurations

The EZ-Guide Plus firmware version 4.00 records more vehicle configuration information than previous versions of the firmware.

If you saved an EZ-Steer system vehicle configuration in a previous version of the firmware, that configuration will be incompatible with the firmware version 4.00.

If you have one or more saved vehicle configurations and you want to upgrade to the EZ-Guide Plus firmware version 4.00:

1. Write down your vehicle configuration information.

   For more information on which settings to record, see Vehicle configuration parameters on page 8.

2. Upgrade the firmware.

3. Re-enter the vehicle information manually.

4. Save the vehicle configuration.

In the EZ-Guide Plus firmware version 4.00, the system must automatically restart to properly load all settings when you reload a saved vehicle configuration.

Confirmation
Use Saved Config "V1 Tractor"?
This will cause a system restart
Yes
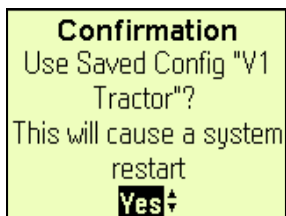
Note – *The EZ-Guide Plus firmware version 3.11 and 3.10 is also incompatible with earlier saved vehicle configurations.*

Vehicle configuration parameters

The parameters in the following tables are stored in the vehicle configuration.

Note – Saved vehicle configurations from previous versions of the firmware are incompatible with the version 4.00 firmware.

General	Terrain compensation	EZ-Steer	EZ-Boom
Ant/impl offset	Orientation	Antenna/axle offset	Swath width
Swath width	T2 filter	Vehicle type	Boom width
Implement offset	Antenna height	Steering wheel diameter	Number of sections
Pass code	Roll calibration	Angle per turn	Section # width [10]
Autopilot RTK network ID	Hide EZ-Steer menu	Freeplay left	Boom switching
	T2 tech on/off	Freeplay right	Boom control
		Wheel base	Lead in
		EZ-Steer heading filter	Off delay
		Motor speed	Rate control
		Aggressiveness	Rate 1
		Min and max speed	Rate 2
		Engage angle and distance	Allowable error
		Disengage distance	Min flow
		Override sensitivity	Inc/dec step
		Engage on AB	Control valve type
		Operator timeout	Frequency
		Seat switch	Gain
			0 Flow offset
			Response 1
			Response 2
			Threshold
			Dead band
			Sensor enabled
			Set point
			Slope

General	Terrain compensation	EZ-Steer	EZ-Boom
			Flow meter cal
			Target rate
			Speed
			Total nozzles
			Current flow
			Vol/nozzle
			Time elapsed
			Meas'd flow
			Calc'd flow
			Diff flow
			Tank capacity
			Current volume
			Low limit

Lightbar	Guidance	Warnings	GPS
Progress lines on/off	Chase/pull	Headland warning	Min satellites for startup
Adjacent swath on/off	LED spacing	Headland lead time	Max HDOP for startup
Field boundary on/off	Lookahead time	Offline warning	Correction type
AB Line display	Auto-detect turn	Low Acc warning	Correct limit (max correction time)
View mode	Nudge increment	Audible warning	GPS min SNR
Path display			GPS min elevation
Contrast			OnPath™ filter settings
Backlight			PV filter
Brightness			OnPath decay time
LED brightness			VBS backup
Antenna/implement offset			WAAS/EGNOS satellite settings
Lightbar mounting			Autoseed™
Map view and status screen selections			
All Data Port Settings screen options			
Radar pulse output rate			
Radar pulse output angle			
Units			
Language			

Note – When you reload a saved vehicle configuration, the lightbar must automatically restart to properly load all settings.

Improved Select Stored AB screen

When you load a saved AB Line with the *Select Stored AB* option, you can view lines within a specific distance.
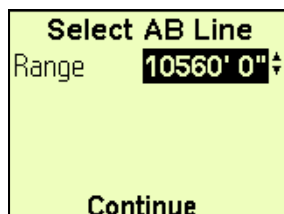
By viewing only the lines that are within a certain range, you can narrow the results that you receive. The default range is 3218.7 m (10560 ft).

Summary view

The summary view shows covered area so you can see any skips or overlaps in material application.
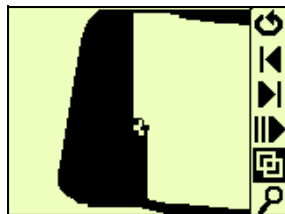
To select the summary view, select ⊞ and then press ⊙. The summary view appears after the offline view.

Zooming in the summary view

In the summary view, there are additional zoom features. To access the additional features:

1. Select the summary view.

2. Select $\mathcal{Q}$.

3. Press ⊚. A different set of action icons appears.
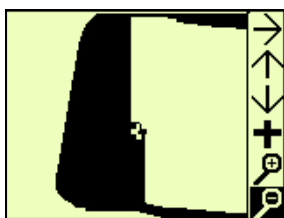
Action icon	Description
$\mathcal{Q}$	End zoom mode
←	Move view left
→	Move view right
↑	Move view up
↓	Move view down
+	Center view on the vehicle
$\oplus$	Zoom view in
$\ominus$	Zoom view out

Path Display

The *Path Display* field has additional options.

The following table shows the effect of the *Path Display* settings on the *Summary* screen:

Item	Description
Off	Coverage is not displayed
On	Coverage is displayed wherever the vehicle drove
Switch	Coverage is displayed whenever it was enabled by an external switch
Engaged	Coverage is displayed wherever the EZ-Steer system was engaged
EZ-Boom	Coverage is displayed wherever the EZ-Boom 2010 system sprayed

To change the *Path Display* setting, select *Lightbar / Display Config*.

EZ-Boom 2010 system functionality

The EZ-Guide Plus lightbar guidance system firmware version 4.00 contains support for the EZ-Boom™ 2010 automated application control system.

The EZ-Boom 2010 system is a spray controller, offering rate control and automated boom switching for both self-propelled and towed sprayers.

For more information, contact your local reseller, or visit www.EZ-Boom.com.

Status text

Four status text items appear on the EZ-Guide Plus system main screen. The system displays two items, and then after three seconds displays the other two items.

To change the status text items:

1. On the EZ-Guide Plus lightbar, select *Lightbar* / *Status Text*. The status text screen appears.
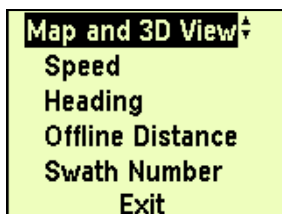

2. To change the status text items that appear on the Map and 3D views, press ⓞⓚ.

   Otherwise, press ▼ until you have selected the view that you want to edit and then press ⓞⓚ.

3. Press ▲ or ▼ until you have selected the new status text and then press ⓞⓚ.

4. Repeat Step 2 for each status text item.

   Note – *To stop the status text items from changing every three seconds, set the first and third items the same, and the second and fourth items the same.*
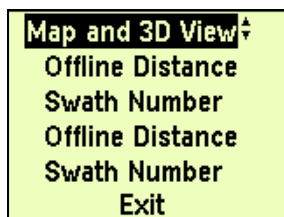
Remote-engage foot pedal

If you use a foot pedal to engage the EZ-Steer system, the foot pedal must be connected to the optional accessory cable.
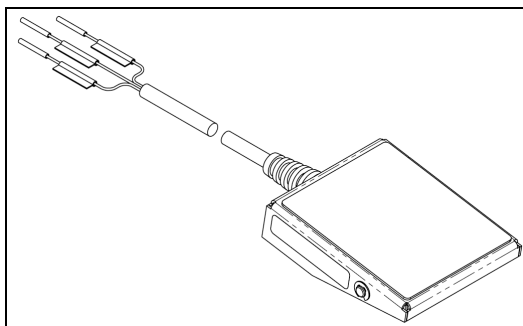

For information on purchasing a foot pedal kit (P/N 60941-00), contact your local EZ-Steer system reseller.

To connect the foot pedal to the accessory cable:

1. Cut the pins off the black and white wires on the foot pedal cable and strip about 2.5 cm (1 inch) of insulation off the switch wires.

    Note – *The green wire is not used and can be cut off if required.*

2. Thread each of the black and white switch wires through a cable seal (supplied with the accessory cable).

3. Insert each of the switch wires and the end of the cable seal into a female terminal connector.
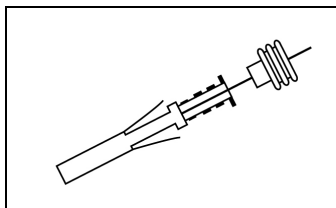
4. Crimp the female terminal connectors with an appropriately sized crimp tool or pliers, and then solder to ensure a good physical and electrical connection. Do not allow excess solder to run into other parts of the contact.

5. Insert the two female terminal connectors and the rubber seal into the two holes of the 2-way female connector as follows:

   – Black wire into terminal B.

   – White wire into terminal A.
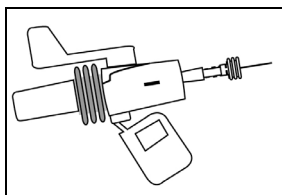
6. Plug the 2-way female connector into the 2-way male connector on the accessory cable.
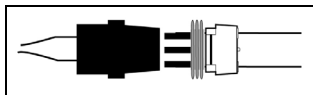
7. Run the cable to a clear location on the floor board. Use double-sided tape or wide velcro strips to secure the pedal. Route the cable under the floor mat.

Tip – To engage the EZ-Steer system with the remote-engage foot pedal, depress the pedal for 0.5 –3 seconds and then release it when you pass the start of the swath. To avoid accidental engaging, the system engages when you release the pedal. To disengage the EZ-Steer system, turn the steering wheel at the end of the swath, stop, or depress the pedal again.

To enable the remote engage foot pedal:

1.   Select *EZ-Steer / External Switch.*
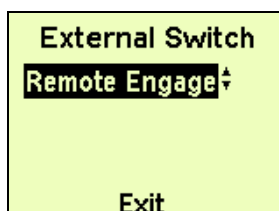
2.   Press ⊽ until *Remote Engage* is displayed.

3.   Press ⊛ to save the setting.

☀ **Tip –** You can disable the remote engage foot pedal without disconnecting by selecting the Disable option.

Default WAAS satellites

There are changes to the WAAS satellites:

- The AOR-W satellite (PRN 122) has moved west.

- There is a new PanAmSat Galaxy 15 satellite (PRN 135) which covers the East Coast of the United States. This means that there is double coverage on the East Coast, where there was previously only a single WAAS satellite providing coverage.

- There is a new Telesat Anik F1R satellite (PRN 138). It is expected to come online in Spring 2007 and will provide double coverage for the central United States.

Note – As of September 2006, the new WAAS satellites are still undergoing testing which may result in reduced accuracy and/or position jumps. The satellites are expected to be fully operational by March 2007.

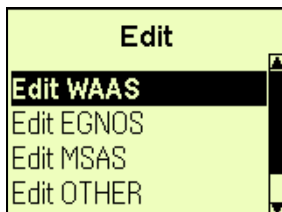The default WAAS satellite settings have changed:

Satellite	Default	Description
PRN-122	Heed Hlth	The system searches for the satellite if the satellite is within the appropriate region and is healthy.
POR	Heed Hlth	
PRN-135	Heed Hlth	
PRN-138	Heed Hlth	

To configure the WAAS satellites:

1. Select *GPS / Corrections*. The *EZ-Guide Plus* screen appears.
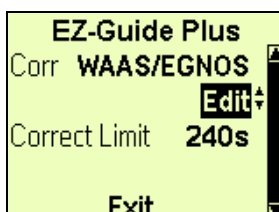
2. Select *Edit* and then press ⊛. The *Edit* screen appears.

3. Select *Edit WAAS* and then press ⊛. The *WAAS* screen appears.
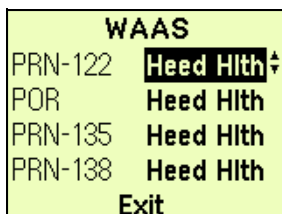
4. Select the appropriate WAAS setting for each satellite.

EGNOS default settings

The default satellite settings for the EGNOS correction service have changed:

Satellite	Default setting	Description
AOR-E	Heed Health	In Heed Health mode, the system searches for the satellite if the receiver is within the appropriate region. If the satellite is not healthy, it is not used.
ARTEMIS	Off	In Off mode, the ARTEMIS satellite is not used.
IOR-W	Heed Health	In Heed Health mode, the system searches for the satellite if the receiver is within the appropriate region. If the satellite is not healthy, it is not used.
IOR	Off	In Off mode, the IOR satellite is not used.

EZ-Steer system warning message for CNH customers

A new EZ-Steer system warning message is displayed for CNH customers in Europe.

Large Headlands improved

Guidance update rate and accuracy are improved when driving large headlands.

Curve recording improved

Curve guidance accuracy has been improved to be 2–3 times better than it was in the version 3.10 firmware.

However, if you do a lot of curve, spiral, or headland patterns, Trimble strongly recommends that you purchase the *Ag*GPS® FieldManager™ display and *Ag*GPS Autopilot™ system which provide more accurate steering on curves than the EZ-Guide Plus system.
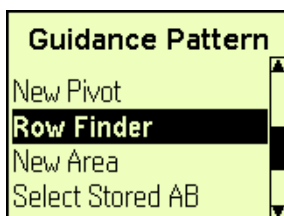
Row Finder field pattern

There is a Row Finder field pattern which is based on the Adaptive Curve pattern.

This pattern makes it easy to find the correct row to drive down after doing a turn.

☼ **Tip –** Row Finder guidance works on straight or curved rows.

```
Guidance Pattern
New Pivot              ▲
Row Finder
New Area
Select Stored AB       ▼
```

To use the Row Finder field pattern:

1. Set the swath width and implement offset.

2. Set the A point.

3. Drive the first swath.

4. When you reach the end of the row, manually set the B point at the end of the row.

5. Use the offline LEDs and screen to turn onto the next swath.

Implement offset

If the vehicle has an implement that is offset to one side of the vehicle, configure an implement offset.

To change the implement offset value:

1. Select a new guidance pattern. The *Swath/Implement* screen appears.

2. Select the *Impl. Offset* field.

3. Press ⊛ or ⊛ until the correct value is displayed.

4. Press ⊛.

☀ **Tip –** In some Adaptive Curves, tight U-turns with an implement offset may not be detected if the implement does not follow the path of a U-turn. If this occurs, set *Guidance / Auto-detect Turn* to Off, manually set B, and then turn onto the next curve.

Area mapping feature

The EZ-Guide Plus lightbar can map area features, calculate the number of acres/hectares, and display the area onscreen while providing guidance.

This feature can be used to mark out an obstacle or excluded area in the field. When the system has finished recording, the number of acres/hectares is calculated and displayed on screen.

To map an area:

1. From the reset guidance screen select New Area.

2. Select the point on the vehicle from which the measurement will be taken (right end of implement, left end of implement, or antenna).

Map Area At

Cancel
Right end of implement
Left end of implement
Antenna
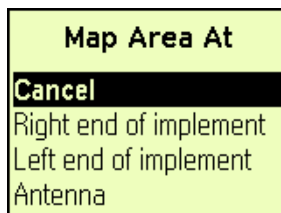
3. Select ✗⌐ to begin mapping the area. The Mapped Area value is continuously updated and displayed on the map screen as you drive around the boundary of the area.

Mapped Area
3.32a
OK= End area
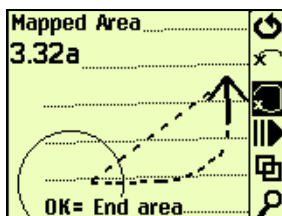
4. Select ↺ or drive back into the start/finish circle to end area mapping.

The mapped area will remain on the screen until the next time power is switched off. Mapped areas are not saved if the power is switched off.

The previously selected AB Line/curve/headland is automatically reloaded after you finish mapping the area.

Only one area can be shown at a time.

The EZ-Guide Plus system does not allow guidance around the mapped area.

If necessary, you can use the pause function to pause mapping to drive around obstacles. When you select the pause/resume icon, a straight line is drawn between the pause and resume points.
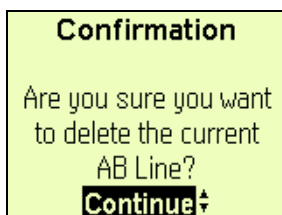
Deleting AB Lines

To delete the current AB Line:

1. Select ⟳ to enter the *Guidance Pattern* screen.

    Guidance Pattern
    Select Stored AB
    Delete Current AB
    Delete All AB's
    Exit
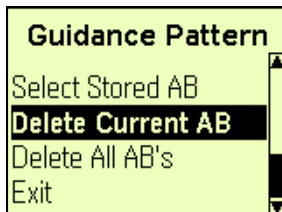
2. Select Delete Current AB. The *Confirmation* screen appears.

    Confirmation
    Are you sure you want
    to delete the current
    AB Line?
    Continue⬍

3. Select Continue to delete the AB Line, or Exit to return to the *Guidance Pattern* screen.

To delete all the stored AB Lines:

1. Select ⟳ to enter the *Guidance Pattern* screen.

2. Select Delete All AB's. The *Warning* screen apppears.

    Warning:
    Are you sure you want to
   delete all the AB's?

    Yes⬍
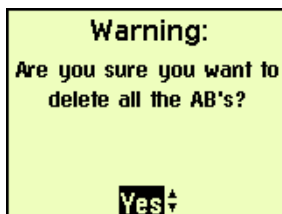
3. Select Yes to delete all the stored field features, or No to exit.

Nudge increment

To change the nudge increment, select *Guidance* / *Nudge Increment.* The default settings are 0' 1" for the EZ-Guide Plus lightbar guidance system and the EZ-Steer assisted steering system, and 0' 0" for the *Ag*GPS Autopilot automated steering system.

Offline error view

There is a new offline error view which shows the offline distance of the vehicle relative to the guidance line for the last 10 seconds. This screen has a fixed scale of ±2 ft. It is very useful for optimizing accuracy when calibrating the EZ-Steer system.
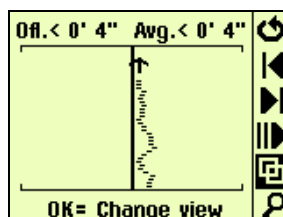

To select this view, press ⊞.

Note – *The offline error view is only available after a field has been defined.*

Pass code

The pass code option can be used to prevent inexperienced operators from modifying the EZ-Guide Plus system configuration settings.

To enable or disable the pass code, select the *Pass Code* screen. The correct pass code is "2005". You cannot change this pass code.

```
Enter Pass Code

    2 0 0 5
```
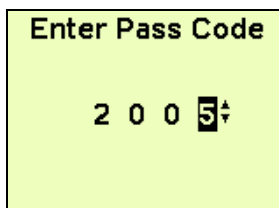
Enhancements to Headland spirals

Headland patterns where you spiral to the center of the field without setting an A or B point have been improved. The standard EZ-Guide Plus icons are now available, which allows you to pause, zoom, or change views while defining the headland.

When you drive the headland and then return to the circle for the first time the field is saved immediately.

Stored AB Lines are numbered

To allow easier identification of the fields in the *Select Stored AB* screen, each field is automatically numbered, and the number appears at the bottom of the screen.
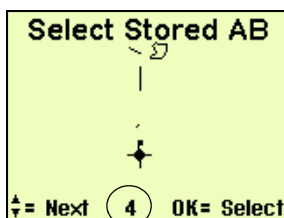
The first three numbers are reserved for headlands and curves. The first straight AB Line or pivot will be number 4.

Note – *To display the AB number on the main map screen, select Lightbar / Status Text and then set one of the status text fields to Field Num.*

NMEA input and output

The EZ-Guide Plus system version 3.0 and later allows simultaneous NMEA input and output. This allows position output to a yield monitor, planter, or laptop PC while using an external GPS receiver such as the *Ag*GPS 252/322 receiver.

To simultaneously receive and output NMEA messages, attach the lightbar and external receiver to a computer or device and then configure the lightbar and external receiver.

For more information, refer to the *EZ-Guide Plus Lightbar: Using Simultaneous NMEA Input and NMEA Output Support Note on www.EZ-Guide.com*.

Minor Enhancements

Adaptive curve snapping issue in terraces

Sometimes the lightbar does not select the correct swath on terraces. For example, this can occur when there is not enough room to make a simple U-turn, as shown in the diagram below.
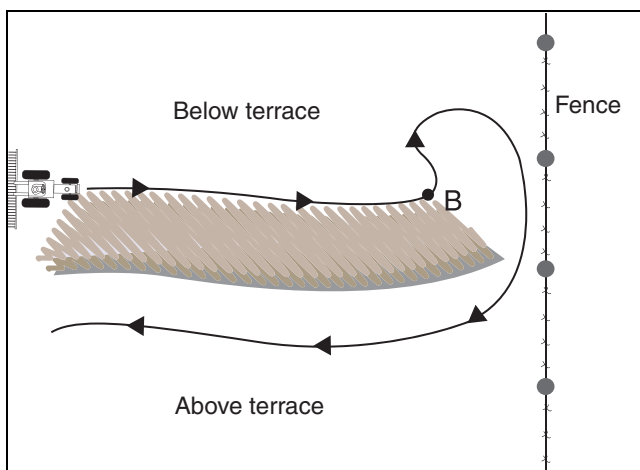
To avoid this issue:

1. Select the *Guidance* screen and then set the Auto-detect Turn option to off.

2. At the end of each swath, manually set a B point.

New status text options for OmniSTAR XP/HP

When you use OmniSTAR XP/HP with an optional *Ag*GPS 252 or 332 receiver, two new status text options are available:

- *GPS Status* displays the XP/HP status (Convrg./Unconvrg.).

- *Conv Dist.* displays the XP/HP convergence distance.

Guidance in pivot headlands

When a partial pivot is being driven, the EZ-Guide Plus firmware version 3.11 displays guidance information for the full pivot.

The section of the pivot that is outside the A and B points is defined as headlands and guidance appears as a dotted line.

Note – When driving beyond the A and B points of a pivot, the Headlands warning still appears.

Documentation update

When you drive with an implement offset the arrow shows the center of the implement, rather than the GPS antenna location. This differs from the information in the *EZ-Guide Plus Lightbar Guidance System Getting Started Guide* version 3.00A.

Other enhancements

The following other enhancements have been made in versions 3.10, 3.11, and 4.00:

- A *GGA Precision* field has been added to the *Data Port Settings* menu. You can set the lightbar to output GGA messages with either six or seven decimal points.

  Use this setting when you are outputting NMEA positions to a yield monitor that requires GGA positions at 6 decimal places.

  ```
  Data Port Settings
  Input None
        8N1      4800
  Output Rate   1Hz
  GGA Precision 7
          Exit
  ```
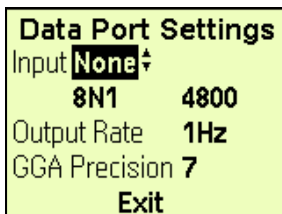
- NMEA RMC messages no longer appear as blank messages when you use uncorrected GPS positions.

- The increment size for swath widths is now 1" or 0.01 m (1 cm).

- You can change the view from Plan to Perspective while defining a field.

- The *Antenna Offset* screen (which you access from the *Lightbar* menu) is now called the *Ant/Impl. Offset* screen.

- The roll value can be displayed as status text. To select this option, select the *Status Text* screen and then set one of the display options to Roll.

- The Roll value cannot be displayed when you use the lightbar with the *Ag*GPS Autopilot automated steering system.

- When the system is configured to use US units, the *Ant/Axle Offset* and *Ant/Impl. Offset* screens display units in inches, instead of feet and inches.

- The Engage on AB option appears on different screens depending on which additional product is attached to the lightbar. If an *Ag*GPS Autopilot system is connected to the lightbar, the Engage on AB option can be found on the *Guidance* screen. If an EZ-Steer assisted steering system is connected to the lightbar, the Engage on AB option can be found on *EZ-Steer / Engage Options*.

- EZ-Guide Plus system kits with the part number 52000-80-POR have a default lookahead of two seconds. To change this, select *Guidance / Look Ahead*.

- When you are driving a Headland pattern and you select the ⟲ icon to finalize the headland, the Is this the final headland? warning appears. Select Yes to confirm that it is the final Headland, or select No if you wish to create additional headlands.

WARNING – If the EZ-Guide Plus lightbar and an *Ag*GPS 252 receiver are started at exactly the same time, the lightbar start-up sequence can stall and nothing is displayed on the lightbar screen. If this occurs, power up the receiver and the lightbar at different times.

WARNING – Correction types that you have not purchased may still be available for selection in the *Correction Types* field. Avoid selecting a correction type that you have not subscribed to, or you may receive low accuracy GPS positions.

T2 Terrain Compensation Technology Operation

When the EZ-Guide Plus lightbar guidance system is connected to an EZ-Steer system controller with terrain compensation capability, the lightbar can make use of T2 terrain compensation technology for improved manual lightbar guidance.

Note – *To obtain assisted steering functionality, you require the complete EZ-Steer system, including the motor.*

Setting up T2 technology

1. Securely bolt the EZ-Steer controller to the floor or to a low position on the rear wall of the cab.

2. Connect the controller to the system and then supply power.

    The *Terrain Comp.* menu will now be available.

3. Select *Terrain Compensation / Antenna Height* and set the antenna height.

4. Select *Terrain Compensation / Orientation* and set the controller orientation.

5. Select *Terrain Compensation / Calibration* and complete the terrain compensation calibration procedure.

6. Select *EZ-Steer / Axle/Ant Offset* and set the axle-to-antenna offset.

7. Select *EZ-Steer / EZ-Calibration* to run the EZ-Calibration wizard.

T2 filter settings

If you have an EZ-Steer assisted steering system, use the following table as a guide to select the most appropriate filter option for your vehicle. These filter options have been optimized for different vehicle and field conditions. The manufacturer recommends you use the default Heavy3 filter option unless you experience poor performance.

Filter setting	Description
Roll only	May give good results when operating a sprayer with a suspended cab at speeds above 19.3 kph (12 mph).
Heavy3 (default)	This filter option provides good performance with all antenna locations and all speeds. This filter will almost always give the best accuracy if the antenna is on the roof of the vehicle or you are using curve, pivot, or headland patterns.

Select *Terrain Compensation / Filter* to change the filter.

Recalibrate the EZ-Steer system for optimal performance with T2 technology (for existing users)

When you use the EZ-Steer system with T2 technology, you will usually need to increase the *Aggressiveness* setting and the Freeplay™ technology left and right values compared to optimal EZ-Steer calibration settings without T2 technology.

Optimizing EZ-Steer system calibration for curves

To obtain smoother steering when operating on curves, try setting the *Aggressiveness* lower than the optimal *Aggressiveness* setting for straight lines. To do this, select *EZ Steer / Vehicle Setup*.

This figure shows the system operating on a curve when the *Aggressiveness* is set correctly:

a) Aggressiveness set correctly
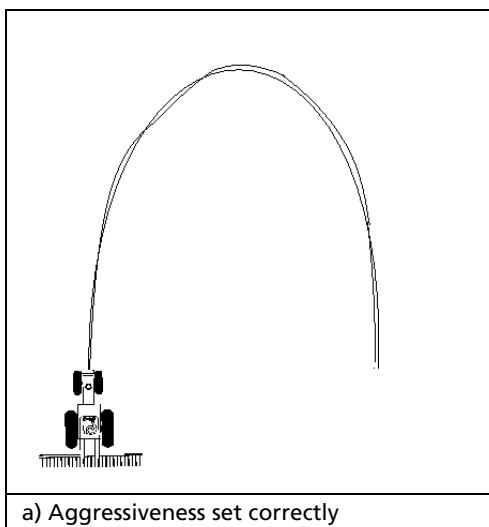
This figure shows the system operating on a curve when the *Aggressiveness* is too high:

b) Aggressiveness set too high
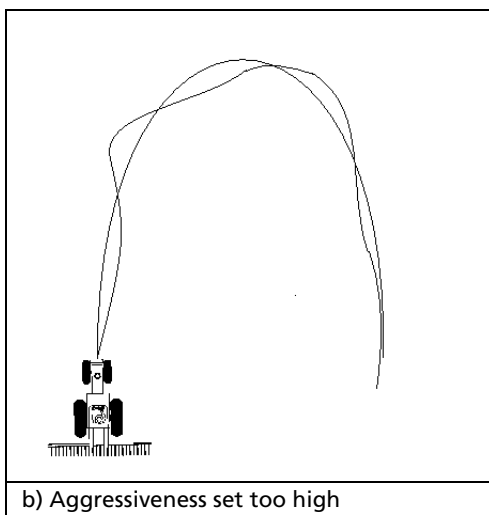
Upgrade procedure

To upgrade your EZ-Guide Plus lightbar to firmware version 4.00:

1. Download and install the EZ-Toolbox™ software version 2.10 from www.EZ-Guide.com.

2. Download the firmware version 4.00 from www.EZ-Guide.com.

3. Follow the instructions in the *EZ-Toolbox Software User Guide*. The *User Guide* is provided with the software.

4. If you also own the EZ-Steer system, use the EZ-Toolbox software to upgrade the EZ-Steer controller firmware to version 4.00. Go to www.EZ-Steer.com.

    Note – Saved vehicle configurations from previous versions of the firmware are incompatible with the version 4.00 firmware. For more information, see Enhancements to saved vehicle configurations on page 6.