EZ-Guide® Plus
Lightbar Guidance System
Getting Started Guide

GETTING STARTED GUIDE

EZ-Guide® Plus Lightbar Guidance System

Version 4.00
Revision A
Part Number 61051-80-ENG
December 2006

Support Information

www.EZ-Guide.com

Copyright and Trademarks

Release Notice

This is the December 2006 release (Revision A) of the *EZ-Guide Plus Lightbar Guidance System Getting Started Guide*, part number 61051-80-ENG. It applies to version 4.00 of the EZ-Guide Plus firmware.

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- an explanation of the problem.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to www.trimble.com/ev.shtml.

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Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

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3.2Section 3.1 notwithstanding, if you acquired this product in Canada, this Agreement is governed by the laws of the Province of Ontario, Canada. In such case each of the parties to this Agreement irrevocably attorns to the jurisdiction of the courts of the Province of Ontario and further agrees to commence any litigation that may arise under this Agreement in the courts located in the Judicial District of York, Province of Ontario. If you acquired this product in the European Union, this Agreement is governed by the laws of The Netherlands, excluding its rules governing conflicts of laws and excluding the United Nations Convention on the International Sale of Goods. In such case each of the parties to this Agreement irrevocably attorns to the jurisdiction of the courts of The Netherlands and further agrees to commence any litigation that may arise under this Agreement in the courts of The Hague, The Netherlands.

3.3Trimble reserves all rights not expressly granted by this Agreement.

Contents

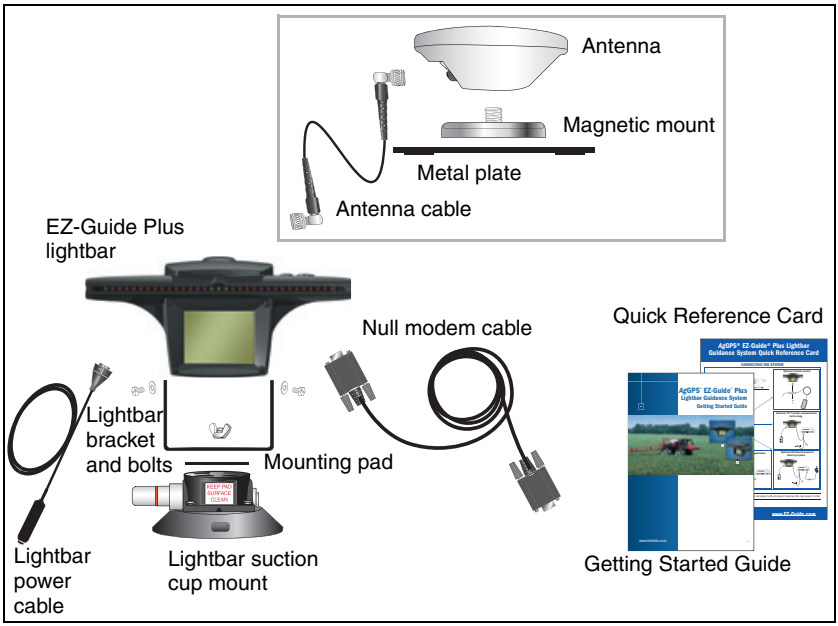
Introduction

Welcome to the *EZ-Guide Plus Lightbar Guidance System Getting Started Guide*. This document describes how to use the EZ-Guide® Plus lightbar guidance system.

The EZ-Guide Plus lightbar guidance system is a lightbar with an integrated LCD screen and an optional integrated GPS receiver.

What's in the EZ-Guide Plus box?

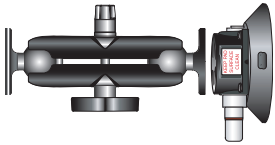
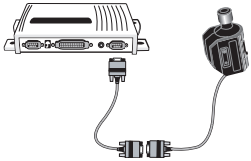
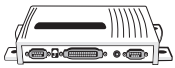
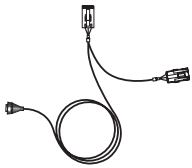
When you receive your EZ-Guide Plus system, check that you have received all the components, as detailed on the packing list. The following diagram shows the standard components.



Note — *The antenna is included if the lightbar has an integrated GPS receiver.*

Optional accessories and upgrades

The following optional accessories and upgrades are available:

Component	Example
Remote control kit	
External interface cable	
RAM mount bracket	
EZ-Steer® assisted steering system upgrade	
EZ-Steer controller with T2™ terrain compensation technology	
EZ-Boom™ 2010 automated application control system	
*Ag*GPS® Autopilot™ automated steering system upgrade + platform kit	
radar cable kits	

For more information and ordering details, contact your local reseller.

⚠ **CAUTION —** Keep the lightbar dry. Do not spray the lightbar with any type of liquid as this will cause it to fail.

Inspect all contents for visible damage, such as scratches or dents. If any components appear damaged, notify the shipping carrier. Keep the shipping and packaging material for the carrier's inspection.

Installing the system

1. Assemble the bracket kit. The bracket is reversible to optimize it for roll angle. For more information, refer to the instructions in the bracket kit.
2. Attach the suction cup to the bracket.
3. Attach the power cable to the lightbar.
4. Mount the lightbar in the required position on the window. See **Mounting the lightbar, page 11**.
5. Attach the antenna to the magnetic mount.
6. Connect the antenna cable to the antenna and route the cable to the cab.
7. Attach the magnetic mount to the cab roof, along the vehicle centerline. Do one of the following:
   - If the cab roof is steel, attach the magnetic mount directly to the roof.
   - If the cab roof is not steel, attach the metal plate to the cab roof. Then attach the magnetic mount to the metal plate.
8. Connect the antenna cable to the lightbar.
9. Plug the power cable into the vehicle cigarette lighter. See **Using the vehicle cigarette lighter, page 12**.

Mounting the lightbar

⚠ **CAUTION —** The suction cup mount is a temporary mounting device. Before you use it, read the manufacturer's instructions provided with the mounting kit.

1. Dampen the rubber seal on the suction cup.
2. Place the suction cup on a clean section of window, and then pump the plunger until its red line is no longer visible.

In addition:

- To ensure that the lightbar stays securely attached, pump the suction cup each day, or whenever the red line appears on the plunger.
- If the lightbar does not stay securely attached with the suction cup, you can glue the cup to the window. Or, attach the lightbar bracket directly to the dashboard, ceiling, or window.

Using the vehicle cigarette lighter

If the power cable is plugged into a cigarette lighter that is not wired through the vehicle ignition, the lightbar receives power whenever the cable is plugged in. To avoid draining the vehicle battery, turn off or disconnect the lightbar from the power source if the vehicle will be unused for an extended time.

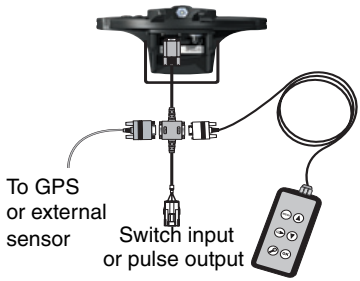
Minimizing GPS signal interference

To minimize any interference to the GPS signal, make sure that the GPS antenna is at least 1 m (3 ft) from any other antenna (including a radio antenna), and at least 100 m (300 ft) from any power line, radar dish, or cell phone tower.

Connecting to other devices

- To use the remote control ***or*** an external GPS receiver ***or*** an external sensor (for example, yield monitor), attach it directly to the lightbar data port connector.
- To use the remote control ***and*** an external receiver or sensor, connect them using the optional external interface cable.

  Note — *You cannot connect an external GPS receiver and external sensor at the same time.*
- To connect a spray switch or device to receive speed pulse outputs, use the optional external interface cable.

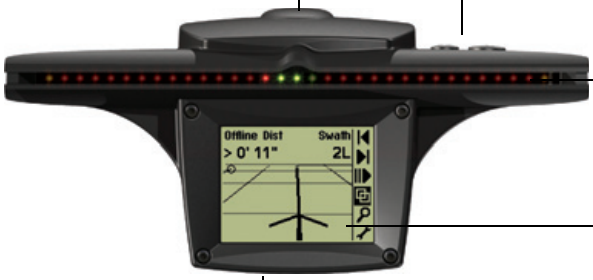


For information on configuring the data port settings, see **Using GPS, page 41**.

Getting Started

This section describes the parts of the EZ-Guide Plus lightbar guidance system and how to configure it. For information on using guidance patterns, see **Getting Started, page 13**.

Parts of the EZ-Guide Plus lightbar



Integrated GPS receiver (optional)
- High-performance
- Integrated WAAS/EGNOS/MSAS receiver
- EVEREST™ multipath rejection technology

Three Buttons
- OK Action selects icon, accepts changes
- ▲ Selects icon, increase configuration value
- ▼ Selects icon, decrease configuration value

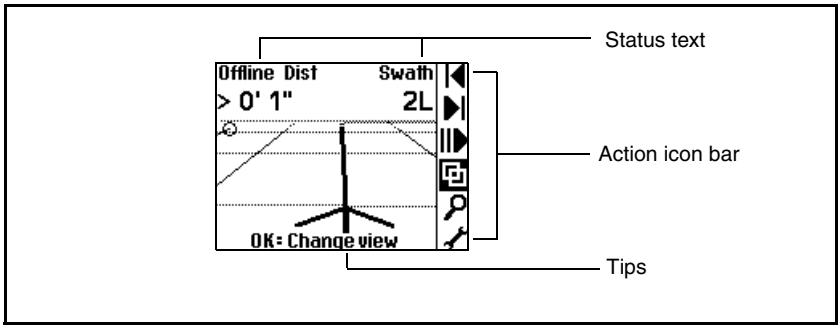
Guidance LEDs
Provide offline guidance to the closest swath

LCD display
- Monochrome
- Anti-glare screen
- Multi-level backlight

Data port
- GPS output
- External GPS input
- External correction input
- GPS diagnostics and configuration
- Pulse output and switch input (requires external interface cable)

Using the lightbar

Items on the main map screen



Action icons

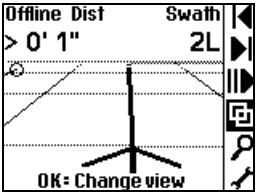
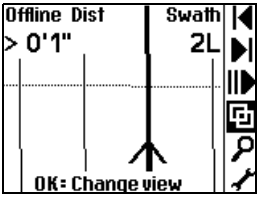
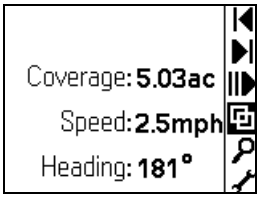
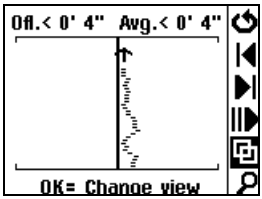
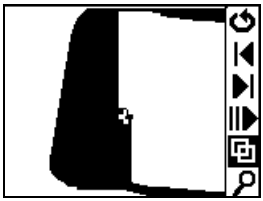
To select an icon, press ▲ or ▼, and then press OK. These action icons can be displayed in the icon bar:

Icon	Description	Icon	Description
	Reset guidance		Nudge left
A	Set Point A		Nudge right
B	Set Point B		Pause/Resume
	Start headland		Change views
	Final headland		Zoom
	Go to main configuration menu		

Note — *Some action icons may not be available until a field is defined.*

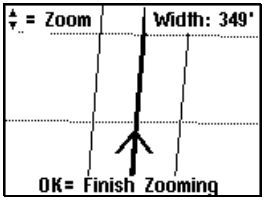
Views

To change between the four views, select ⧉.

View	Details
	Perspective map This is the default screen for guidance. It displays two status text options.
	Plan map This is the default screen when you: • define the field • pass the end of the swath • move offline by more than half a swath • pause guidance It displays two status text options.
	Status This screen displays up to four status text options. To configure the text, use the *Status Text* configuration option.
	Offline This screen displays the vehicle offline error for the last 10 seconds. This view is not available until you have defined a field.
	Summary This screen displays covered area. It allows you to see any skips or overlaps in material application. To zoom in on or move the Summary view, select the ⌕ icon.

Zooming

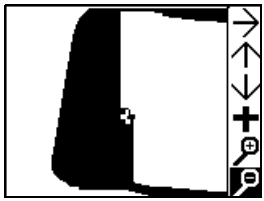
To enter zoom mode, select , or press on the remote control. The zoom screen appears.



- To change the zoom scale, press ▲ or ▼.
- To accept the zoom scale and return to the map view, press OK, or press on the remote control.

Zooming in the Summary view

In the Summary view, there are additional zoom features. To access the additional features, when you are in the Summary view press . A different set of action icons appears:



Action icon	Description
	End zoom mode
←	Move view left
→	Move view right
↑	Move view up
↓	Move view down
+	Center view on the vehicle
	Zoom view in
	Zoom view out

Configuring the lightbar

Before you use the lightbar in the field, check and configure the lightbar settings from the *Lightbar* menu:

1. To access the configuration menu, do one of the following:
   - Select and then press OK.
   - Press MENU on the remote control.
2. To select a configuration option and display the value, press ▲ or ▼. To accept the setting, press OK.
3. To change the value, press ▲ or ▼. To save the change, press OK.
4. To exit the configuration menu, do one of the following:
   - Press ▲ or ▼ until you have selected the *Return to Guidance* option, and then press OK.
   - Press MENU on the remote control.

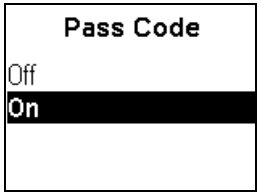
Pass code restriction

The EZ-Guide Plus lightbar has a pass code option that protects the lightbar configuration settings from being accessed and modified.

Enabling or disabling the pass code

1. From the configuration menu, select *Pass Code*. The *Pass Code* screen appears.
2. Press ▲ or ▼ to select the required option and then press OK.

   You are returned to the main menu.



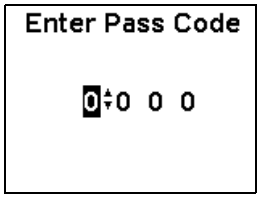
If the Pass Code option has been set to On, then you are prompted to enter the Pass Code when you select 🔧 or press MENU.

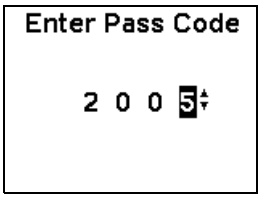
Pass Code entry

The correct Pass Code is "2005". To enter the code when the *Enter Pass Code* screen appears:

1. Press ▲ or ▼ until the correct digit appears in the column.
2. Press OK to select the next column.
3. Repeat Steps 1 and 2 until all four digits are correct.

If you enter the wrong code, you are returned to the main screen.

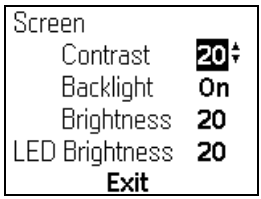




Adjusting the brightness and contrast

You can view the LCD screen in all conditions—from bright sunlight to night time.

If necessary, use *Lightbar / Contrast / Brightness* to adjust the screen contrast, turn on the backlight, or adjust the backlight and LED brightness.



The lightbar retains its backlight setting even if the lightbar is reset to the default settings.

Tip — *If the backlight is configured to On, it automatically turns off during daylight hours, and turns back on in the late afternoon. When the backlight is enabled but currently not on, the Backlight setting displays Auto.*

Setting the units and language

By default, the units are set to US and the language is set to English. To change:

- the units to metric, select *Lightbar / Units*
- the language to Portuguese, Spanish, French, German, or Italian, select *Lightbar / Language*

Changing the display orientation

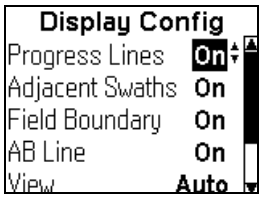
Generally, mount the lightbar with the LEDs above the screen (upright). If you mount the lightbar with the LEDs below the screen (inverted), select *Lightbar / Lightbar Mount* and change the setting.

Upright

Inverted

Configuring the display

Select *Lightbar / Display Config* to enable or disable any of the following items displayed on the plan and perspective maps. Set:



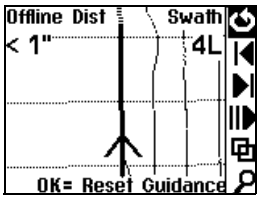
- Progress Lines to On to give a sense of perspective and speed.
- Adjacent Swaths to On to display one swath either side of the current swath.
- Field Boundary to On if the field is a Headland.
- AB Line to On to display the AB Line.
- Path Display to the relevant option to display the path driven. See **Path Display on the Summary screen, page 19**.

You can also use this screen to change the *View* option:

- Auto: The view automatically changes between plan and perspective views in headlands
- Fixed: The view remains fixed

Path Display on the Map and 3D screen

By default, the path you have driven is always displayed on screen as a dotted line.



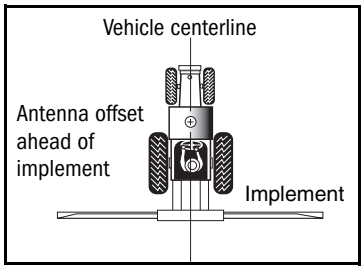
Path Display on the Summary screen

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 drives
Switch	Coverage is displayed when it is enabled by an external switch
Engaged	Coverage is displayed when the EZ-Steer system is engaged
EZ-Boom	Coverage is displayed where the EZ-Boom 2010 system sprayed

Setting the antenna offset

By default, the antenna is assumed to be at the implement position. If the antenna is not mounted at the implement position, to ensure correct guidance, set an antenna offset using *Lightbar / Ant/Impl. Offset*.



CAUTION — The antenna must be mounted on the vehicle centerline. Otherwise, offline guidance will not be correct.

Coverage area

Coverage area is calculated whenever the spray switch is connected and on. For information on connecting a spray switch, see **Connecting to other devices, page 12**.

By default, Coverage Area is displayed on the *Status* screen. To display Coverage Area on a map view instead, select *Lightbar / Status Text*.

Tip — *To save the coverage area value, you must Pause before turning off the system. Otherwise the value will be lost when you restart the system.*

If you load an existing AB Line with a coverage area value, you can choose to add to the value, or reset to 0.

Status text

The *Plan Map, Perspective Map*, and *Status* views display four status text items. The *Plan Map* and *Perspective Map* views show two of the status text items at the top of the screen, which then change to the other two items. The status text items cycle every three seconds. The *Status* screen shows all four items at once.

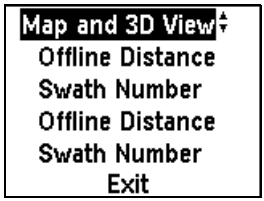
Status text item	Definition
Swath Number	Swath number of the closest swath.
Offline Distance	Distance offline from the closest swath.
Speed	Current speed.
Heading	Current heading.
Field Area	Area of the field calculated half a swath width outside the path driven. A value is displayed only for Headland patterns.
Mapped Area	The size of a mapped area, in acres (US) or hectares (metric).
Satellites	Number of GPS satellites used.
HDOP	Horizontal Dilution of Precision. This is a measure of accuracy based on the geometry of the satellites in the sky. An HDOP of 2 or less is good.
Height	Current antenna height above mean sea level (MSL).
GPS Status	Current GPS status. XP/HP status (Convrg./Unconvrg.) (If you use OmniSTAR XP/HP with an optional high accuracy receiver.)
Correction Age	The age of the GPS signal.
Coverage Area	Area applied while spray switch was on or sprayed using the EZ-Boom system. Calculated as distance x swath width. To save the coverage area value when turning off the system, pause guidance before disconnecting power.
Nudge	Displays accumulated nudge perpendicular to the direction of travel.
Yaw Rate	The speed of change in yaw.
Roll Rate	The speed of change in roll.
Overlap	The current amount of spray overlap (positive value) or skip (negative value).
TRate	Application target rate: Shows which rate is selected (Rate1, Rate2, or Manual) and the target rate.
Pressure	The current spray system pressure.
Pressure B	The second pressure sensor.

Status text item	Definition
Current Rate	The current rate (gal/Ac or L/ha).
Current Flow	The current flow (gal/min or L/min).
Applied Volume	Total volume (gal or L) applied.
Tank Volume	The current volume of product in the spray tank (gal or L).
Swath Pts	The number of points in the current swath.
Swath Len	The length of the current swath.
Conv Dist	XP/HP convergence distance.
Roll	The roll angle of the vehicle.
Field Num	ID# of the AB Line.
None	No status text is displayed.

Stopping the status text from cycling

To stop the Status Text from cycling in the *Plan Map* and *Perspective Map* views, set the:

- first and third status items the same
- second and fourth status items the same



Getting Guidance

The EZ-Guide Plus lightbar guidance system provides the following pattern options:

Pattern	Definition
AB Line	Straight guidance based on A and B points that define the initial line.
A+	Straight guidance based on an A point and the previous line heading.
Identical curve	Curve guidance based on the initial curve.
Adaptive curve	Curve guidance based on the last curve driven.
Headland	Records headlands of any shape as you drive around the field. Can provide guidance on multiple headland passes and straight swath guidance inside the headlands.
Center-pivot	Curve guidance in a center-pivot field.
Row finder	When you drive with an implement that spans several rows, the system guides you to the next appropriate swath without having to count the rows in between yourself.
Area	Mark out an area to show obstacles/excluded areas, calculate the size of an area, or to display an area onscreen.
Select Stored AB	Select and load a previous AB Line.
Delete Current AB	Delete the current AB Line.
Delete all ABs	Delete all saved AB Lines

For more information, see **Using guidance patterns, page 24**.

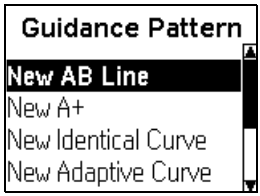
Note — *If you are using WAAS corrections and the system has been turned off for more than 2 hours, a warning appears when the first WAAS DGPS position is received. For best accuracy, wait for 10 minutes after receiving the WAAS DGPS warning before you set an AB Line or select a stored field.*

Note — *If you are using a receiver with RTK or OmniSTAR XP/HP corrections, do not define a new guidance line until the* ***Low Accuracy*** *message stops flashing. Otherwise, you may get significant pass-to-pass drift until the receiver reaches its highest level of accuracy (****Fixed or Convrg.****). If the GPS Status is* ***Float or Unconvrg.****, the accuracy is still converging.*

Resetting guidance

1. Select ↻. The *Guidance Pattern* screen appears.
2. Press ▲ or ▼ to choose the required pattern and then press OK.

   A message appears asking you to confirm your choice. This prevents accidental resetting of the guidance pattern.
3. To confirm, press OK.

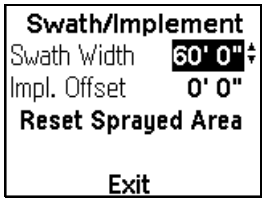


Configuring the swath width

Once you select a pattern, the *Swath/Implement* screen appears.

To change the swath width value:

1. Select the *Swath Width* field.
2. Press ▲ or ▼ until the correct value is displayed.
3. Press OK.



Tip — *To avoid skips between swaths, set the swath width to 0.3 m (1 ft) less than the total implement width.*

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

1. Select the *Impl. Offset* field.
2. Press ▲ or ▼ until the correct value is displayed.
3. Press OK.

Tip — *If an implement offset is configured, the guidance arrow will represent the center of the implement, instead of the center of the vehicle.*

Note — *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.*

Using guidance patterns

This section describes how to define and use each of the available guidance patterns.

The AB Line is a line that runs between Point A and Point B, although you may not always ***set*** a Point B. In most cases, the AB Line is the reference line for subsequent swaths.

The start and end of the initial swath that defines the swath pattern appear on the lightbar screen as a circle (Point A) and a square (Point B).

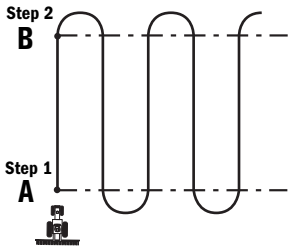
Swaths drawn on screen extend 1 km (0.62 mi) beyond Point A and Point B, and the extensions appear as dotted lines. This makes it easier to see where the next swath is, and to get online after the turn.

Note — *The initial swath (AB Line) appears as a thin, solid line; the current swath appears as a bold line.*

AB Line pattern

Use the AB Line pattern when no headlands are required and you drive the field in parallel straight lines.

1. At the start of the first swath, map Point A.
2. Drive to the other end of the field, and at the end of the first swath, map Point B.



Tip — *Set Point B part way down the swath to get guidance down the first pass, and then reset Point B at the end of the field.*

3. Turn left or right for the next swath. The next swath is automatically selected.
4. Steer the vehicle so that you center the green lights in the lightbar as you drive forward along the swath.

   Note — *On straight AB Lines, if you complete a swath that is longer than the previous one, the EZ-Guide Plus system automatically extends the guidance path for the following swaths so that headland warnings do not appear prematurely.*

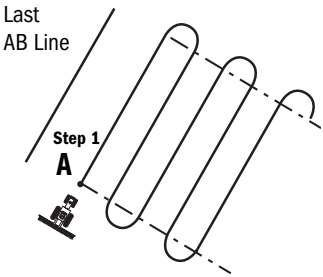
A+ pattern

Use the A+ pattern when you need guidance exactly parallel to the last AB Line, for example when:

- driving adjacent fields
- mapping the AB Line on a road down the side of the field
- skipping an access road in a field

1. To map the start of the first swath, map Point A.

   The heading of the AB Line equals either the previous AB heading or the manually entered heading (if the current vehicle heading is within ±90 degrees of the AB heading). Otherwise the A+ heading is in the opposite direction.

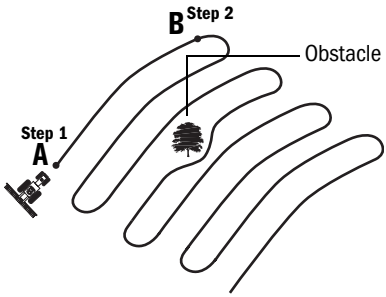


2. Follow the AB Line for guidance down the first swath.
3. Turn left or right for the next swath. The next swath is automatically selected.
4. Steer the vehicle so that you center the green lights in the lightbar as you drive forward along the swath.

Identical curve pattern

Use the Identical curve pattern when you want to work the field with gentle curves. This pattern provides guidance based on the initial curve. It ignores any deviation around an obstacle.

1. At the start of the first swath, map Point A.
2. Drive the initial curve. At the other end of the first swath, map Point B.
3. Turn left or right for the next swath. The next swath is automatically selected.
4. Steer the vehicle so that you center the green lights in the lightbar as you drive forward along the swath.



Note — *Guidance extends beyond the end of curved swaths. This makes it possible to get LED guidance back onto the swath if the vehicle drives past the end of a swath. The extended swath lines do not appear on screen.*

Adaptive curve pattern

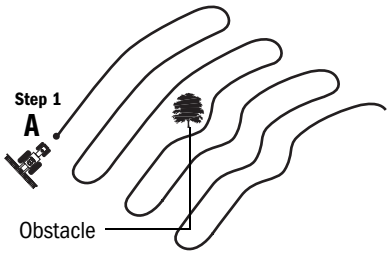
Use the Adaptive curve pattern to follow gentle contours in the field, or when you need to avoid obstacles. This pattern provides guidance based on the last curve driven.

Note — *By default, the end of the swath is automatically detected when you do a U-turn. If you prefer to manually mark the end of each swath, from the main menu, select Guidance / Auto-detect Turn and change the setting to Off. You must then reset Point B at the end of every pass, to mark the end of the swath before you start the turn.*

Simple curves (using Adaptive curve pattern)

To drive simple Adaptive curves with the default of Auto-detect Turn set to On:

1. At the start of the first swath, map Point A.
2. Drive the initial curve.
3. Turn left or right for the next swath. The next swath is automatically selected.
4. Steer the vehicle so that you center the green lights in the lightbar as you drive forward along the swath.

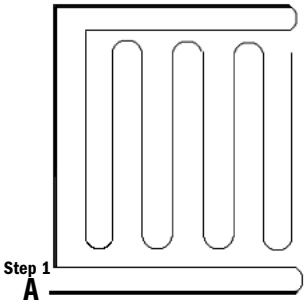


C-clamp (using Adaptive curve pattern)

To use the Adaptive curve pattern to get C-clamp guidance with the default of Auto-detect Turn set to On:

1. At the start of the headland, map Point A.
2. Drive around the headland in a C-clamp pattern.
3. Turn left or right for the next swath. The next swath is automatically selected.
4. Steer the vehicle so that the green lights in the lightbar are centered as you drive forward along the swath.

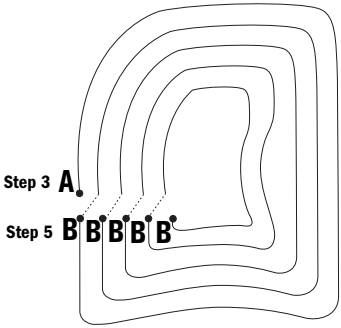
   Note — *The bold lines in the figure show where you must drive without guidance.*



Spiral (using Adaptive curve pattern)

To use the Adaptive curve pattern to get spiral guidance into the center of the field:

1. From the *Guidance* menu, set *Auto-detect Turn* to Off.
2. Start a new field using the Adaptive Curve pattern.
3. At the start of the headland, map Point A.
4. Drive around the headland.
5. When you are nearly back at Point A, map Point B.



Note — *Make sure that you are not within one swath width of the start point. If you are, Point B will not be set.*

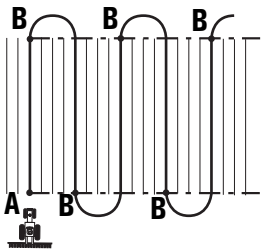
6. Turn into the field. The next swath is generated off the last pass.
7. On each pass, when you are nearly back to where you started the headland, reset Point B to mark the end of the swath.

Rowfinder (using Adaptive curve pattern)

When you drive with an implement that spans several rows, you can navigate to the next appropriate swath without having to count the rows in between yourself.

To use the Adaptive Curve pattern to count the rows that you can skip:

1. Select *Guidance / Auto-detect Turn* and set *Auto-turn* to Off.
2. Reset guidance and then select the Adaptive Curve pattern.
3. Select the *Swath Width* value that matches the width of your implement.
4. Mark Point B at the end of the row.
5. Find the next row to drive down by turning until you see three green LEDs on the lightbar.



Headlands pattern

Use the Headlands pattern when:

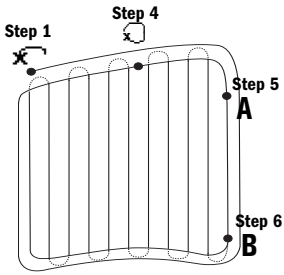
- you need to apply the headland area first, to give you room to turn when you apply the straight swaths
- you want to know the area of the field

You can do as many headland circuits as required before you change to straight swaths. The Headlands pattern automatically increments to the next headland when you enter the circle around the start point of the headland.

Tip — *To pause, zoom, or change the headland view, click the appropriate icon.*

Multiple headlands

1. Start a headland.
2. Drive around the field area. The headland is recorded.
3. When you return to the headland start point, the next headland swath is automatically generated.



4. On your final headland, press ↩ before you return to the circle. This stops the lightbar from generating a new headland swath and allows you to map A and B points.

   You continue to receive guidance to the final headland until you drive off the pass by half a swath.
5. To map the start of the first straight swath, map Point A at any time.
6. Drive to the other end of the field and then map Point B.

   Note — *Straight swaths automatically fill the headland boundary. The AB Line does not need to be the full length of the field.*

Tip — *The Headland pattern displays the edge of the innermost headland.*

7. Turn left or right for the next swath. The next swath is automatically selected.
8. Steer the vehicle to center the green lights in the lightbar as you drive forward along the swath.

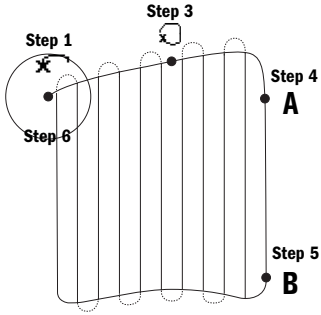
   Note — *The **IN HEADLAND!** warning only appears if your antenna offset is set to 0. If your antenna offset is greater than 0, you can achieve a similar effect by setting the Headland warning lead time to greater than 0 (for example, 3 seconds). The **HEADLAND!** warning will then appear before the headland is reached.*

Single headland

1. Start the headland.
2. Start driving around the field area. The headland is recorded.
3. After a short distance, identify the current headland circuit as the final one.

   Note — *Do this before you enter the circle around the start point or map A and B points.*

   The headland is still recorded until you reach the circle around the start point.



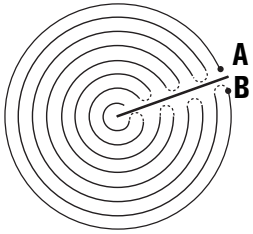
4. To map the start of the first straight swath, map Point A.
5. Drive to the other end of the field and map Point B.

   Note — *Straight swaths automatically fill the headland boundary. The AB Line does not need to be the full length of the field.*
6. Enter the circle around the start point of the headland to complete the headland. The area is then displayed.
7. Turn left or right for the next swath. The next swath is automatically selected.

Steer the vehicle to center the green lights in the lightbar as you drive forward along the swath.

Center-pivot pattern

Use the Center-pivot pattern for a field that is irrigated using a center-pivot. With this pattern, you can drive concentric circles around the center-pivot.



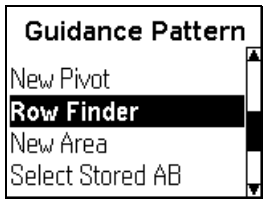
1. Position one wheel of the vehicle in a pivot wheel rut, with the rear of the vehicle to the pivot arm. If the field is not a full circle pivot, face the rear of the vehicle to the edge of the field.
2. To start the pivot, map Point A.
3. Drive around the field. Keep the vehicle wheel in the rut. The lightbar does not yet provide guidance.
4. When you are almost back to the pivot arm or the edge of the field, map Point B. The EZ-Guide Plus lightbar generates guidance swaths.
5. Turn left or right for the next swath. The next swath is automatically selected.
6. Steer the vehicle so that you center the green lights in the lightbar as you drive forward along the swath.

Note — *To work from the center of the field outwards, the initial pivot must have:*

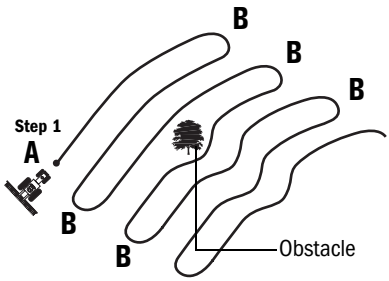
- *a radius of at least two swath widths*
- *an arc length of at least two swath widths*

Row Finder pattern

The Row Finder pattern makes it easy to find the correct row to drive down after you make a turn. It is based on the Adaptive Curve 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. The swath number will appear in the top right corner of the screen.
5. Repeat Step 4 for each successive swath.
6. Use the offline LEDs and screen to turn onto the next swath.



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

Mapped area

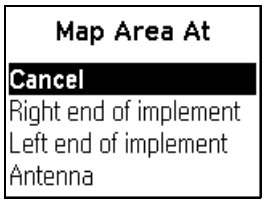
With area mapping you can:

- map area features
- mark out an obstacle or excluded area
- Calculate the number of acres/hectares
- display the area onscreen while receiving guidance

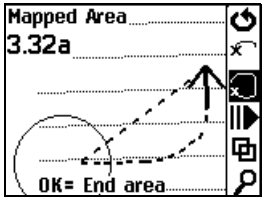
To map an area:

1. From the main screen, select . The *Guidance Pattern* screen appears.
2. Select New Area. The *Map Area At* screen appears.
3. Select the point on the vehicle from which the measurement will be taken (right end of implement, left end of implement, or antenna).

   The main screen appears.



4. Select to begin mapping the area. The *Mapped Area* value continuously updates. It appears on the map screen as you drive around the boundary of the area.
5. Select or drive back into the start/finish circle to end area mapping.



   The mapped area will remain onscreen 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.

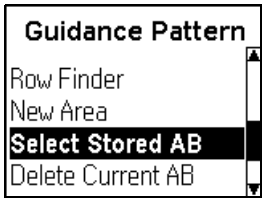
Saving, loading, and deleting AB Lines

The EZ-Guide Plus system can save, load, and delete AB Lines.

Saving AB Lines

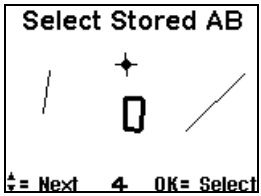
The EZ-Guide Plus system can save up to 96 straight swaths or pivots, and up to 3 curve or headland swaths. The system automatically saves the last AB Line. When you have saved more than the permitted number of AB Lines, the AB Lines that have not been used for the longest time are overwritten.

Loading an existing AB Line



1. Select ↻ to reset guidance. The *Guidance Pattern* screen appears.
2. Select *Select AB Line* and then press OK. The *Select AB Line* screen appears.
3. Press ▲ or ▼ to adjust the range of AB Lines to select from and then press OK.

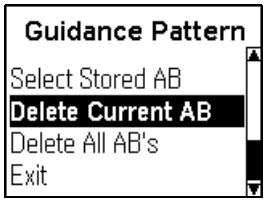
   The *Select Stored AB* screen appears. It displays all saved AB Lines within the range you selected. The position of the vehicle is shown as a cross with a dot in the middle. The currently selected AB Line or curve is displayed with thicker bold lines.



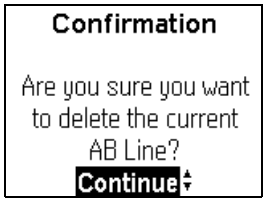
   The number of the current line is shown in the middle of the bottom of the screen. Positions 1–3 are used for headlands and curves. The first straight AB or pivot will be number 4.
4. Press ▲ or ▼ to select the correct AB Line and then press OK. The *Swath/Implement* screen appears.
5. Set the swath width and the implement offset.
6. Select Exit and then press OK.

The system loads the line.

Deleting the current AB Line



1. Select ↻. The *Guidance Pattern* screen appears.
2. Select *Delete Current AB.* The *Confirmation* screen appears.



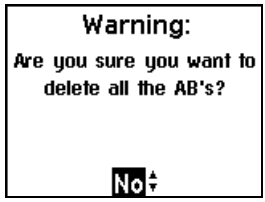
3. Select *Continue*. The *Guidance Pattern* screen appears.
4. Select a new field pattern to create and then press OK.
5. Set the swath width and implement width.
6. Select Exit and then press OK.

   The main screen appears.

Deleting all AB Lines

1. Select ↻ to enter the *Guidance Pattern* screen.
2. Select *Delete All AB's*. The *Warning* screen appears.
3. Select *Yes* to delete all AB Lines. The *Guidance Pattern* screen appears.
4. Select a new field pattern to create and then press OK.
5. Set the swath width and implement width.
6. Select Exit and then press OK.

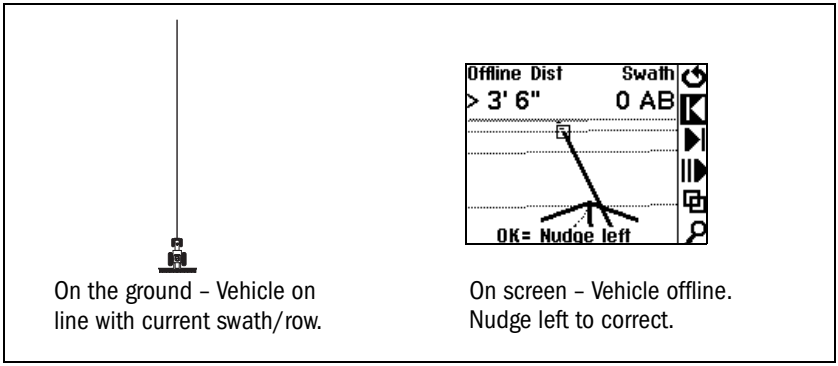
   The main screen appears.



Nudge

Nudging moves the guidance line back to the correct path. Nudge a guidance line if you need to correct for:

- GPS position drift when returning to the field for guidance, for example after pausing or turning the unit off and on
- GPS satellite constellation changes while driving in the field



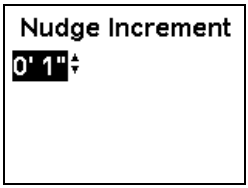
On the ground – Vehicle on line with current swath/row.

On screen – Vehicle offline. Nudge left to correct.

Nudge is always applied to the guidance line relative to the vehicle heading. To nudge, select ⏮ or ⏭ from the action icons.

The default nudge increment value is 0.02 m (0' 1"). To change the amount by which nudge increases:

1. Select *Guidance / Nudge Increment*. The *Nudge Increment* screen appears.
2. Press ▲ or ▼ to select the required nudge increment and then press OK.

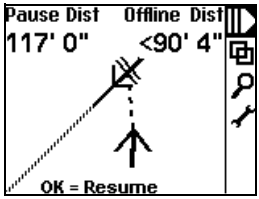


Each nudge moves the guidance line by the *Nudge Increment* value. For example, if the *Nudge Increment* is set to 0' 3" and you press ▶| twice, the total nudge distance is 6 inches to the right.

To display the total accumulated nudge perpendicular to the current vehicle heading, select Nudge as one of the status text items. See Status text, page 20.

To reset the nudge distance to 0, select *Guidance / Reset Nudge*, and then select Reset. The main screen appears, with the swath in the original position.

Pause and resume



To pause guidance, select ||▶ or press (||/▶) on the remote control.

When you pause guidance:

- The display changes to the Plan map view (if the *Display Config / View* option is set to *Auto*)
- An icon appears at the pause location and indicates the direction of pause
- The pause swath appears on the screen
- The screen automatically zooms to keep your current position and the pause icon on the screen. You cannot zoom manually.
- A dotted line joins your current position and the pause point
- The map status text changes to display the distance to the pause point and the offline distance from the pause swath
- The LEDs do not provide offline guidance while you are more than half a swath from the pause swath
- Progress lines and adjacent swaths are not displayed

To resume guidance, select ||▶ or press (||/▶) on the remote control

Driving on large fields

At distances greater than 10 km (6.2 mi) from the original AB Line, the curvature of the Earth's surface can cause a reduction in GPS position accuracy. Consequently, the lightbar does not support more than 1000 swaths to the left and 1000 swaths to the right of the original AB Line.

If you need to create more than 1000 swaths either to the left or the right of the AB Line, create a second AB Line. This will ensure that you maintain the highest level of steering accuracy.

Configuration for Australia

For optimal lightbar performance in Australia, make the following changes:

1. Select *Lightbar / Units* and then change the units to Metric.
2. To use DGPS positions from an external receiver:
   a. From the configuration menu, select *Lightbar / Data Port Settings*.
   b. In the *Input* field, select External GPS.
   c. Change the baud rate settings to match the NMEA GGA and VTG output rate from the external DGPS receiver.
3. If external corrections are available, for example, using the CSi SBA-1 beacon receiver:
   a. Select *Lightbar / Data Port Setting*.
   b. In the *Input* field, select Corrections.
   c. Change the baud rate settings to match the output of the correction receiver, for example, 8N1 9600.

   If corrections are not available, use the OnPath advanced filter technology for improved pass-to-pass accuracy. The filter is enabled by default.
4. If you are in large open fields with no trees, increase the decay time to 120 minutes for even better pass-to-pass accuracy. If you increase the decay time, then note the following:
   - You must be in an open area, and have good GPS positions when you select (Reset Guidance).
   - You should not see any position jumps. If you see position drift, or constant offset from the AB Line, you may need to reduce the decay time to less than 15 minutes.

Speed pulse output

The EZ-Guide Plus system can output simulated radar pulses at a pre-defined speed pulse output rate. This can be used to:

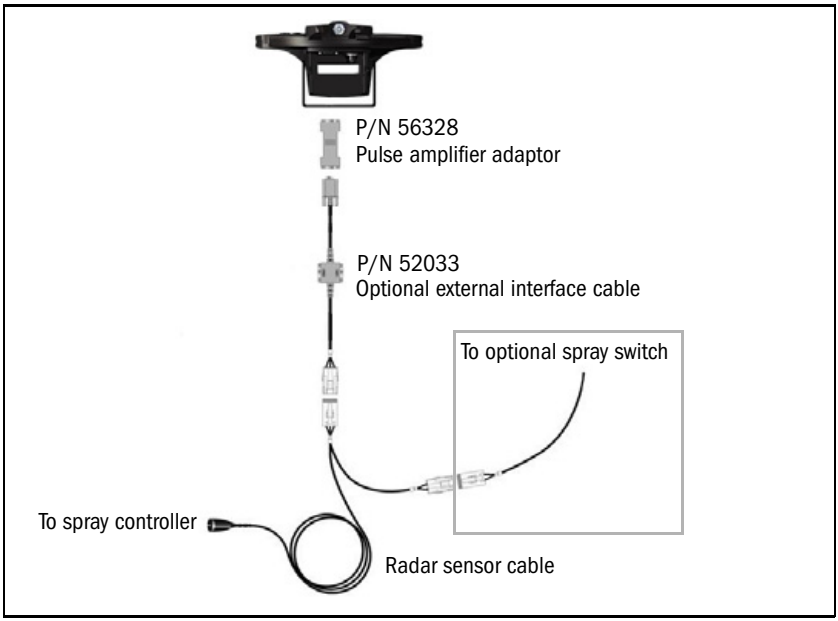
- Replace the radar / true ground speed sensor for speed on the vehicle.
- Send speed to any other agricultural device requiring speed pulses, for example, yield monitor or variable rate controller.

To use speed pulse output, you need a radar sensor cable kit, which includes a pulse amplifier adaptor. To purchase one, contact your local reseller.

Connecting a device

To connect the lightbar to a spray controller:

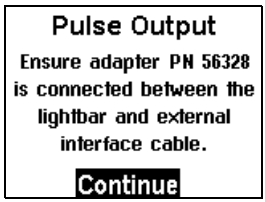
1. Attach the pulse amplifier adaptor to the serial port of the lightbar and then attach the optional external interface cable (P/N 52033) to the other end of the adaptor.
2. Attach the radar sensor cable to the external interface cable.
3. If required, connect a spray switch into the WeatherPack connector on the radar sensor cable using a fly-lead.



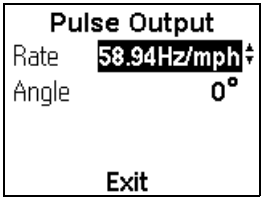
Setting up the lightbar

To enable pulse output:

1. Select *Lightbar / Pulse Output.* The pulse output warning screen appears.
2. Ensure that the adaptor is connected, and then press OK.



The *Pulse Output* screen appears.



3. Select the output rate expected by your device.

   Note — *Most Raven and Midtech controllers use 58.94 Hz/mph (34.80 Hz/kph).*

4. In the *Angle* field, press ▲ or ▼ until the correct angle is selected.

   On most vehicles, the radar unit is mounted vertically (0°), and does not affect the speed pulse output. However, if your radar unit is mounted at an angle, you must configure the lightbar to compensate for this angle. If you do not set the correct radar unit angle, the speed pulse output will be wrong.

   Note — *To obtain the correct unit angle, refer to the vehicle documentation or contact your vehicle reseller. If you intend to recalibrate your controller for best accuracy, then leave the Angle value at zero degrees.*

Setting up a controller

On a Raven controller:

1. Make sure that the speed input is set to Speed Radar SP2.

   Note — *You usually choose the speed input setting when you first calibrate the unit; the choices given in most Raven controllers are SP1 or SP2. SP2 is the correct setting for Speed Radar inputs. For more information on how to check this setting, refer to your variable rate controller instruction manual.*

2. Make sure the speed calibration value is set correctly. For the most accurate results, re-calibrate the unit to match the lightbar output.

For information on how to calibrate the unit, refer to the controller instruction manual.

Tip — *To discover the accuracy of your current settings, compare the speed value indicated on the lightbar guidance system with that on the spray controller.*

On a Midtech controller:

1. On the Midtech spray controller, ensure the speed calibration value is set correctly. For the most accurate results, re-calibrate the unit to match the lightbar guidance system output.
2. For information on how to calibrate the unit, refer to the controller instruction manual.

Tip — *To discover the accuracy of your current settings, compare the speed value indicated on the lightbar guidance system with that on the spray controller.*

Configuring Guidance Settings

You can configure the guidance and warning settings of the EZ-Guide Plus lightbar guidance system to suit your personal preference and your application.

Guidance settings

Configure the following lightbar settings from the *Guidance* menu.

LED mode

Mode	Definition
Chase	Chase the lights to stay online. The lights represent the swath location relative to the vehicle.
Pull	Center the lights to stay online. The lights represent the vehicle location relative to the swath.

LED spacing

The LED spacing is the distance represented by one LED. Decrease the LED spacing to increase the sensitivity of the LEDs.

Look ahead

Use the look ahead time to predict your future vehicle path to allow for reaction time and vehicle turn speed. Set the look ahead time in seconds. For larger vehicles that take longer to turn, increase the time.

Note — *For 4WD articulated tractors, always set the look ahead time to 0 seconds.*

Auto-detect turn

This setting is used only for the Adaptive Curve pattern. This setting defaults to On, which means that a new swath is automatically generated when a U-turn is detected. To manually identify the end of each adaptive curve swath, change this setting to Off.

Terrain compensation

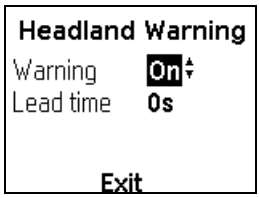
For terrain compensation information, refer to the *EZ-Steer System Reference Guide*.

Warning options

Configure the following warning option settings from the *Warnings* menu. Warnings are displayed as a flashing message on the screen.

Headland warning

The EZ-Guide Plus system displays a message when you pass the end of the swath. You can also configure a lead time for the headland warning so that the EZ-Guide Plus system warns you as you approach the end of the swath. By default, this is set to 0 sec.



To turn off the headland warning, or to set the lead time, use the *Headland Warning* configuration screen.

Note — *The **IN HEADLAND!** warning only appears if your antenna offset is set to 0. If your antenna offset is greater than 0, you can achieve a similar effect by setting the Headland warning lead time to greater than 0 (for example, 3 seconds). The **HEADLAND!** warning will then appear before the headland is reached.*

Offline warning

The EZ-Guide Plus system can display a message when you have gone too far offline. By default, this is set to 0'0" (no warning). To configure an offline warning, use the *Offline Warning* configuration screen.

Low accuracy warning

There are three states for a low accuracy warning:

State	Definition
High accuracy only	Uses only high accuracy positions for guidance. When low accuracy positions are received, guidance is suspended. The lightbar displays a warning.
Warn low accuracy	When low accuracy positions are received, guidance continues normally. The lightbar displays a warning. This is the default.
No warning	When low accuracy positions are received, guidance continues normally. There is no warning.

Audible warning

If you have a remote control or an alarm connected to the EZ-Guide Plus system, it can emit an audible warning. To enable the audible warning, use the *Audible Warning* configuration screen.

Using GPS

Before using GPS with the EZ-Guide Plus lightbar:

- Configure the lightbar data port to work with GPS input
- View GPS and DGPS diagnostics on the lightbar
- Configure the GPS receiver to work with the lightbar
- Set information specific to the GPS receiver

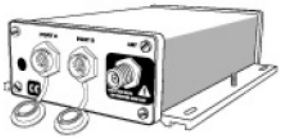
If you have a lightbar without integrated GPS, the lightbar defaults to receive external GPS positions. Simply connect the GPS receiver to the lightbar and confirm that the receiver is configured to output NMEA GGA and VTG messages at 5 Hz, 38400, 8N1. For information how to check the NMEA messages, see External correction input, page 49.

To receive signals from GPS satellites, you must have a clear view of the sky. GPS does ***not*** work indoors.

Anything that blocks light also blocks GPS satellite signals. This includes people, buildings, heavy tree cover, and vehicles. GPS signals can pass through leaves, plastic, and glass, but these all significantly weaken the signal.

About the GPS receivers

Some common GPS receivers have several different names:

GPS receiver	Example	Referred to as
*Ag*GPS 106/AFS 100/NH 100		DGPS smart antenna
*Ag*GPS 110/AFS 110/NH 110 *Ag*GPS 114/AFS 130		DPGS/OmniSTAR smart antenna
*Ag*GPS 132/AFS Universal/ NH 134		DGPS box receiver
*Ag*GPS 252/AFS 252/NH 252/ AgLeader GPS 5100		High accuracy smart antenna
*Ag*GPS 332		High accuracy box antenna

Configuring the lightbar data port

Receiver selection

You can purchase the EZ-Guide Plus lightbar with or without integrated GPS. It is also possible to connect other GPS receivers to the lightbar, to provide external GPS reception.

To select the GPS receiver that will be used with the lightbar:

1. Select *Lightbar / Data Port Settings*.
2. Select the *Input* field and then press ▲ or ▼:

Select input type ...	For ...	Notes
None	integrated receiver	
TSIP Receiver	TSIP-capable GPS receivers	This option automatically configures the receiver to the correct baud and parity and NMEA messages and rate.
External GPS	other GPS receivers	Confirm that the port settings match the receiver output.
Autopilot	Autopilot systems	
Corrections	external RTCM corrections from a radio	Confirm that the data port settings match the receiver output settings.
Diagnostics	diagnostics with AgRemote	You cannot use the *Auto port configuration / Force connection* options in AgRemote. You must manually set the parity and baud options in the *Data Port Settings* screen to match the AgRemote settings.

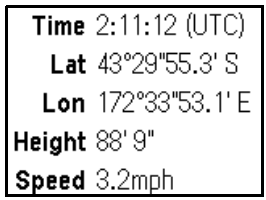
Diagnostics

The diagnostic menus of the EZ-Guide Plus lightbar display information about the quality of the GPS and DGPS signal. This may be useful when troubleshooting GPS faults.

GPS diagnostics

Select *GPS / GPS Diagnostics* to view GPS and receiver information. There are several screens of information.

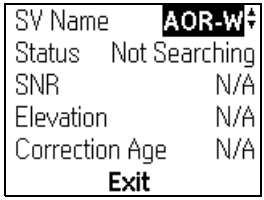
- To change to another screen, press ▲ or ▼.
- To return to the *GPS* menu, press OK.



DGPS diagnostics

Select *GPS / DGPS Diagnostics* to view information about DGPS satellites. There is one screen of information for each DGPS satellite for the selected correction type.

- To change to another satellite, press ▲ or ▼.
- To return to the *GPS* menu, press OK.



Configuring the receiver

This section covers receiver configuration for:

- GPS limits
- Corrections
- Filters

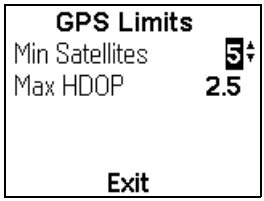
Note — *At mid latitudes, the GPS cross-track errors that occur when you drive East–West are typically double the cross-track errors that occur when you drive North–South. This is a characteristic of all GPS receivers and guidance systems, and occurs because the GPS satellite orbits do not go over the poles. For GPS system status details, go to http://www.navcen.uscg.gov/ado/GpsActiveNanu.asp.*

GPS limits

You can configure the minimum acceptable number of satellites and the Horizontal Dilution of Precision (HDOP) that must be present before GPS guidance will start. HDOP is a measure of accuracy based on the geometry of the satellites in the sky. An HDOP value of 2.0 or less is considered good.

Note — *The GPS Limits settings can only be altered when you use a TSIP-capable GPS receiver. If the Input field is set to Autopilot, they are unavailable.*

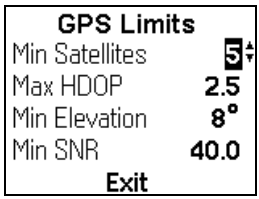
To allow guidance to start in an area that has many trees, hills, or other obstacles, reduce Min Satellites to 5, or increase Max HDOP to 3.0. This allows guidance to start with lower accuracy positions. To configure these settings, select *GPS / GPS Limits*.



CAUTION — Changing any of the GPS Limits default settings can cause GPS position errors greater than one foot. If you are using the EZ-Steer system, these errors can cause the EZ-Steer system to steer the vehicle offline.

Note — *If you are using the EZ-Steer system, the EZ-Steer system will disengage when these limits are exceeded.*

If the lightbar has an integrated GPS receiver, or if you use the lightbar with a high accuracy smart antenna, you can also specify a minimum elevation and a minimum SNR for GPS satellites. (Satellites that do not meet the criteria will not be used). However, if you lower these values, this may result in more GPS position drift.



Corrections

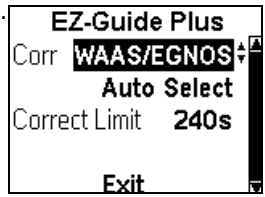
To improve GPS accuracy, the integrated GPS receiver uses correction messages from a Wide Area Augmentation System (WAAS) satellite, European Geostationary Navigation Overlay System (EGNOS) satellite, or Multifunctional Transport Satellite-based Augmentation System (MSAS) satellite.

Note — *MSAS is still at an early stage of development, and will be for use only in Japan.*

The following correction options are available:

Receiver	None	WAAS/EGNOS	Beacon	Omni* VBS	Omni* XP/HP	RTK
Integrated						
Integrated lightbar receiver	✓	✓				
TSIP-capable						
– DGPS smart antenna	✓	✓				
– DGPS/OmniSTAR smart antenna	✓	✓		✓		
– DGPS box receiver	✓	✓	✓	✓		
– High accuracy smart antenna	✓	✓		✓	✓	✓
– High accuracy box antenna	✓	✓	✓	✓	✓	✓

To access the correction options, select *GPS / Corrections*.



Tip — *The selected TSIP-capable GPS receiver determines which corrections are available in the Corr field. You cannot configure Corrections for non-TSIP-capable GPS receivers.*

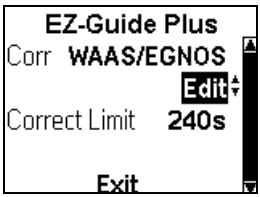
You can select from four levels of satellite reception:

Setting	Description
On	The system searches for the satellite, regardless of the region or the satellite health.
IgnoreHlth	The system searches for the satellite if the satellite is within the appropriate region, regardless of satellite health.
HeedHlth	The system searches for the satellite if the satellite is within the appropriate region and is healthy.
Off	The system does not search for the satellite.

Editing WAAS

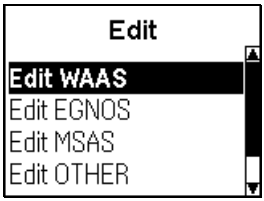
To configure the WAAS satellite:

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



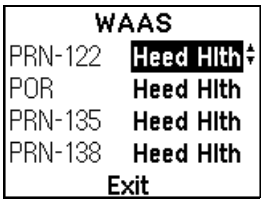
The *Edit* screen appears.

3. Select *Edit WAAS* and then press OK.



The *WAAS* screen appears.

4. Select the appropriate WAAS setting for each satellite from the table on page 46.



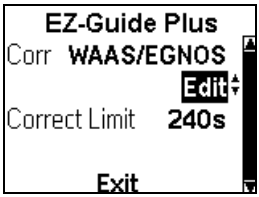
Satellite	Default
PRN-122	Heed Hlth
POR	Heed Hlth
PRN-135	Heed Hlth
PRN-138	Heed Hlth

Editing EGNOS

The EZ-Guide Plus system can use the European EGNOS system.

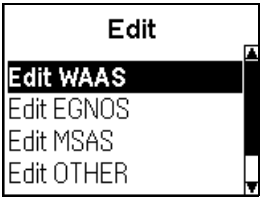
To configure the system for use with EGNOS:

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



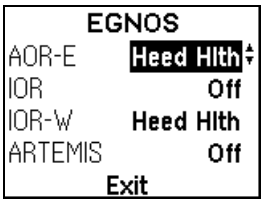
The *Edit* screen appears.

3. Select *Edit EGNOS* and then press OK.



The *EGNOS* screen appears.

4. Select the appropriate setting for each satellite. See the table on page 46.



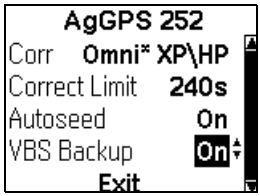
The default EGNOS settings are:

Satellite	Default	Description
AOR-E	Heed Hlth	Operational
IOR	Off	Test signal
IOR-W	Heed Hlth	Operational
ARTEMIS	Off	Test signal

XP/HP options

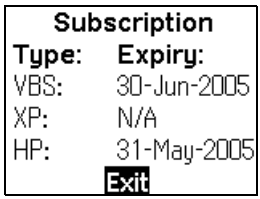
If you have a high accuracy smart antenna and are using XP/HP corrections, you can enable the following options:

- Autoseed™ fast restart technology - enables faster XP/HP convergence if the vehicle has not moved since power was turned off
- VBS Backup - enables the use of VBS corrections if XP/HP corrections are lost



Subscriptions

The OmniSTAR corrections (VBS, HP, and XP) are subscription services, which are automatically configured. To view your subscription information, select *GPS / Subscription.*



There are two status text options for use with OmniSTAR XP/HP:

- *GPS Status* displays the XP/HP status (Convrg./Unconvrg.)
- *Conv Dist.* displays the XP/HP convergence distance.

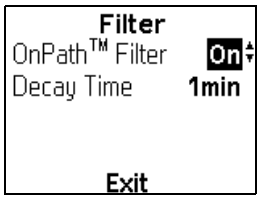
For more information on subscription services, contact OmniSTAR.

Filters

The EZ-Guide Plus lightbar offers two methods of GPS signal filtering for TSIP-capable GPS receivers: OnPath and PV Filter. The selected GPS receiver determines which option is available. No filters are available for other receivers:

Receiver	OnPath	PV Filter
Integrated	✓	
High accuracy smart antenna	✓	
Other external TSIP-capable receivers		✓

OnPath advanced filter technology

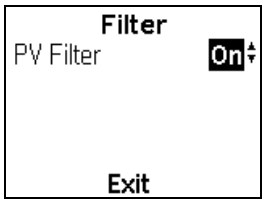


Position jumps can occur when any of the GPS satellites being used by the lightbar are obscured, for example, when you pass a row of trees.

The EZ-Guide Plus system internal GPS receiver and the high accuracy smart antenna have OnPath™ advanced filter technology that detects and eliminates these position jumps, significantly improving pass-to-pass accuracy.

If there are no trees or obstacles, set the decay time to 60–120 minutes. If the field is surrounded by a large number of trees or other obstructions, set the decay time to 1–5 minutes. This prevents accumulated position errors that can otherwise exceed 1 m (3.3 ft).

PV filter



TSIP-capable receivers other than the integrated receiver and the high accuracy smart antenna use a PV Filter.

To enable or disable the PV Filter, select *GPS / Filter* and then change the *PV Filter* field to On or Off.

Note — *If you are using the EZ-Steer system, the PV Filter is disabled, and this option is hidden.*

Receiver-specific info

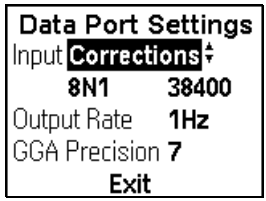
If you have a lightbar with integrated GPS, the GPS receiver is powered on as soon as the lightbar is powered on. To receive GPS satellite signals, connect the antenna to the antenna cable connector on the back of the lightbar.

Integrated receiver

By default, the receiver will automatically use WAAS, EGNOS, or MSAS corrections according to your location.

External correction input

If you use the integrated GPS receiver, you can use external RTCM corrections instead of WAAS, EGNOS, or MSAS corrections. To configure the integrated GPS receiver to use external RTCM corrections, in *Lightbar / Data Port Settings* set the *Input* option to Corrections. Check that the port settings match the receiver output settings.



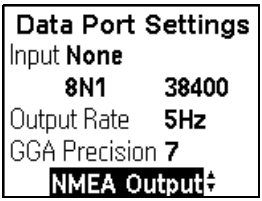
GPS output

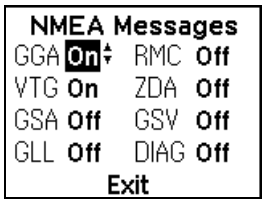
When you are using the integrated GPS receiver, the EZ-Guide Plus system is configured to output the GPS positions to another device (for example, a yield monitor). By default, the GPS data is sent at 4800, 8N1, and the default messages are NMEA GGA and VTG at 1 Hz.

To change the output rate, select *Lightbar / Data Port Settings* and then select the required value.

Note — *For best performance when sending NMEA output at 5 Hz, it is recommended that you change the baud rate to 9600 or higher.*

To output messages in a different format, highlight *Exit*, and then press ▼ until *NMEA Output* is displayed. Press OK. Turn on or turn off the messages as required.





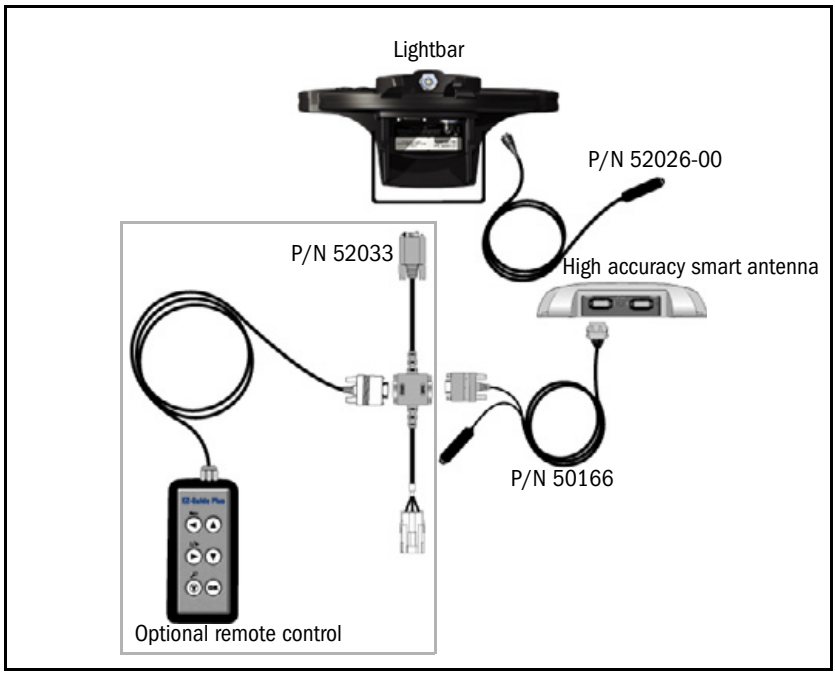
NMEA input and output

You can simultaneously receive and output NMEA messages. This allows position output to a yield monitor, planter, or laptop PC while using an external GPS receiver, for example the high accuracy smart or box antennas.

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.

High accuracy smart antenna

The following figure shows how to connect the high accuracy smart antenna to the lightbar.



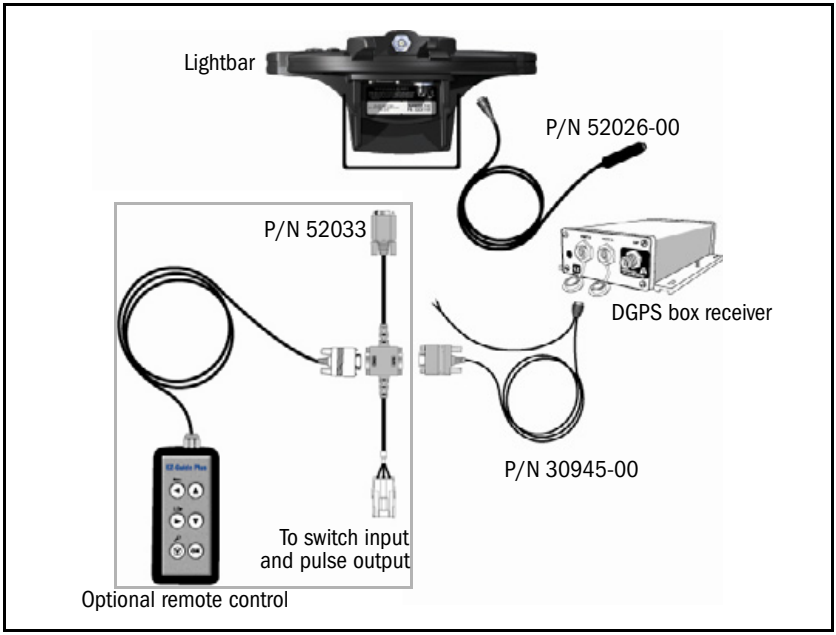
Note — *If using a high accuracy smart antenna with a lightbar which does not have an integrated GPS receiver, you do not need to change any settings on the EZ-Guide Plus lightbar guidance system. If you are using a lightbar with internal GPS, set the Data Port to TSIP Receiver.*

Configuring the receiver

When the high accuracy smart antenna is connected to the EZ-Guide Plus lightbar and the *Input* field on the *Data Port Settings* screen is set to TSIP Receiver, the receiver is automatically configured.

DGPS box receiver

The following figure shows how to connect the DGPS box receiver to the lightbar.



If you are using a DGPS box receiver, you need to disable the 1HZ VTG setting:

1. From the *Home* screen, press > until *Configuration* appears and then press v.
2. Press > until the *GPS Config* screen appears.
3. Press v until the *1Hz NMEA* screen appears.
4. Change VTG to vtg as follows:
   a. Press > to highlight VTG.
   b. Press v to change VTG to vtg.
   c. Press ↵ to save the setting.

Selecting the correct OmniSTAR satellite manually

1. From the *Home* screen, press > until the *Configuration* screen appears.
2. Press v and then press > until the *DGPS Config* screen appears.
3. Press v until the *DGPS Source* screen appears.
4. Press > and then v to change the setting to OmniSTAR.
5. Press v until the *EZ Sat: Omni** screen appears.
6. Press > and then v to select the correct region.

DGPS smart antenna and DGPS/OmniSTAR smart antenna

The lightbar automatically configures the DGPS and DGPS/OmniSTAR smart antennas for a 5 Hz output rate.

You need to disable the 1Hz VTG output setting. To do this, connect the receiver to an office computer running the AgRemote/GPSRemote software, which is available from www.EZ-Guide.com. In the AgRemote software:

1. From the *Home* screen, press > until *Configuration* appears and then press v.
2. Press > until the *GPS Config* screen appears.
3. Press v until the *1Hz NMEA* screen appears.
4. Change VTG to vtg as follows:
   a. Press > to highlight VTG.
   b. Press v to change VTG to vtg.
   c. Press ↵ to save the setting.

External non-TSIP-capable receiver

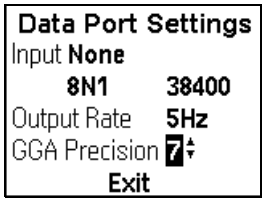
The EZ-Guide Plus lightbar requires GGA positions for guidance. it is recommended that you also configure your receiver to output VTG messages. If the EZ-Guide Plus lightbar does not receive VTG messages, guidance may be erratic, especially if you have an antenna offset or are working at slow speeds.

Note — *When you use external GPS input, the EZ-Guide Plus system does not output GPS data to another device. To send GPS positions to another device, connect the external receiver directly to the device.*

Outputting NMEA messages to a yield monitor

On the *Data Port Settings* screen, the *GGA Precision* field allows you to set the number of decimal places used in NMEA GGA positions (6 or 7).

When you are outputting NMEA positions to a yield monitor, set the *GGA Precision* field to the correct number of decimal places for your monitor.



Overview of the Menu

Menu	Menu option	Description	Default value
EZ-Steer	Back to Main Menu	Return to the main menu	—
	Axle/Ant Offset	Distance between rear axle and antenna	0"
	Use/Save Config	Loads or saves vehicle configurations	—
	Vehicle Setup	Vehicle type and settings	Type – Tractor Steer whl dia. – 16.0" Angle/turn – 20° Freeplay Left – 1.00" Freeplay Right – 1.00" Wheel base – 118" Heading Filter – 3
	EZ-Calibration	Guided process that configures EZ-Steer system for your vehicle	—
	Aggressiveness	Aggressiveness percentage	105%
	Engage Options		Min speed – 2.0mph Max speed – 15.0mph Max angle – 15° Engage Offln. – 6'0" Diseng. Offln. 10'0" O'ride Sensitivity – 20% Motor Spd – Auto High Engage On AB – Off
	Operator Timeout	Alert appearance rate	10min
	External Switch	Whether a switch is connected	Disable
	Diagnostics	EZ-Steer system information	2
	Fault history	EZ-Steer system faults	—

Menu	Menu option	Description	Default value
EZ-Boom	Back to Main Menu	Return to the main menu	—
	Boom	The spray boom settings	Swath Width – 60'0" Boom Width – 60'0" Fence Nozzles – None Number of Sections – 1 Section 1 Width – 720"
	Ant/Impl. Offset	Distance between implement and antenna	0"
	Swath Control	Spray start and stop times	Boom Control – Auto Lead In – 1.0s Off Delay – -1.0s Minimize Skip
	Application	Application limits	Rate Control – On Rate 1 – 20.0g/a Rate 2 – 18.0g/a Allowable Error – 2% Min Flow – 0.0g/m Step – 1.0g/a
	Control Valve	Control valve settings	Type – Inline Servo Response1 – 100% Response2 – 24% Threshold – 3
	Tank Setup	Tank volume and warning	Capacity – 500.0g Curr Volume – 500.0g Low Limit – 50.0g
	Pressure Cal	Pressure calibration sensor presence	Sensor – Off
	Flow Calibration	Flow calibration settings	Flow M Cal – 3500g Target Rate – 20.0g/a Speed – 10.0mph Total Nozzles – 20
	Diagnostics	EZ-Boom 2010 system information	—
	Fault History	EZ-Boom 2010 system faults	—

Menu	Menu option	Description	Default value
Terrain Comp.	Back to Main Menu	Return to the main menu.	—
	Orientation	The direction that controller connectors point.	Front
	Filter	Terrain compensation filter	Heavy 3
	Antenna Height	The height of the antenna above the ground.	0"
	Calibration	Performs the terrain compensation calibration.	—
	Hide EZ-Steer	Hide the EZ-Steer menu	No
	T2 Tech. On/Off	T2 technology on/off	On
	Diagnostics	Terrain compensation information	—
Lightbar	Back to Main Menu	Return to the main menu.	—
	Display Config	Turn on or turn off screen items, such as progress lines, field boundary, or adjacent swath lines and configure the view setting.	Progress lines – ON Adjacent swaths – ON Field boundary – ON AB Line – ON View – Auto Path display – ON
	Contrast/Brightness	Adjust the screen contrast and backlight brightness. Adjust the LED brightness.	Screen contrast – 10 Screen backlight – Auto LED brightness – 20
	Ant/Impl. Offset	Distance from the antenna to the implement.	0' 0"
	Lightbar Mount	Upright. Inverted – Inverts display and offline LEDs.	Upright
	Status Text	Configure the status text items for the map views and the status screen.	Map and 3D View – Offline Distance – Swath Number – Offline Distance – Swath Number Status Screen – Field Area – Coverage Area – Speed – Heading

Menu	Menu option	Description	Default value
Lightbar (continued)	Data Port Settings	Configure the input and output for the data port.	Integrated GPS lightbar – Input – None – 8N1 4800 – Output rate – 1 Hz GGA Precision – 7 No GPS lightbar – Input –TSIP Receiver – 8N1 38400 GGA Precision – 7
	Pulse Output	Configure the pulse output rate.	Rate – Off Angle – 0°
	Units	US – Feet, miles per hour, acres. Metric – Meters, kilometers per hour, hectares.	US
	Language	Configure operating language for the system.	English
	Tests	Run self-, button, LED, LCD, LCD backlight, or GPS status tests.	—
Guidance	Back to Main Menu	Return to main menu.	—
	LED Mode	Chase – Chase the lights to stay online. The lights represent the swath location relative to the vehicle. Pull – Center the lights to stay online. The lights represent the vehicle location relative to the swath.	Chase
	LED Spacing	Distance represented by one LED.	1' 0"
	Look Ahead	Look ahead time in seconds. Gives advanced warning of turns by projecting the current position forward.	1s
	Auto-detect Turn	Enable or disable Auto-detect Turn for the Adaptive Curve pattern.	On
	Nudge Increment	Set the amount that nudge increases by.	0' 1"
	Reset Nudge	Resets nudge back to 0".	—

Menu	Menu option	Description	Default value
Warnings	Back to Main Menu	Returns to main menu	–
	Headland Warning	Turn the headland warning ON or OFF. Configure the warning lead time.	Warning – ON Lead time – 0s
	Offline Warning	Distance off-swath at which the offline warning message appears. Set to zero to disable the warning.	0' 0"
	Low Acc Warning	High Acc Only – Accept only high accuracy positions. Warn Low Acc – Accept all positions, but warn when low accuracy. No Warning – Accept all positions, including less accurate positions, without warning.	Warn Low Acc
	Audible Warning	Turn the audible warning alarm ON or OFF.	OFF
GPS	Back to Main Menu	Returns to main menu.	–
	GPS Diagnostics	Display GPS receiver status and diagnostic information.	–
	DGPS Diagnostics	View DGPS satellite diagnostic information.	–
	GPS Limits	Min Satellites Max HDOP Min Elevation[1] Min SNR[1]	5 3.0 8" 40.0
	Corrections[2]	Configure receiver correction options.	
	Filter[2]	Configure GPS filter settings.	Depends on receiver
	Subscription[3]	View OmniSTAR VBS or XP/HP subscription expiry information	–
Defaults	Back to Main Menu	Returns to main menu.	–
	Restore Defaults	Return all configuration settings to factory defaults.	–
About...	–	Display lightbar version information.	GPS Rate – 5Hz NMEA
Pass Code	–	Enables/disables the configuration protection pass code.	Off

[1]These options are only available when you have a lightbar with an integrated receiver, the high accuracy smart antenna, or the high accuracy box antenna.

[2]These options are only available when you have a lightbar with an integrated GPS receiver or are using a TSIP-capable external receiver with the Data Port Setting Input set to TSIP External.

[3]These options are only available on TSIP-capable receivers that support OmniSTAR corrections.

Troubleshooting

Problem	Possible cause	Solution
Screen is blank or hard to see	Backlight is off	Turn on the cab light. Then use *Brightness/Contrast* to turn on the backlight.
	Backlight level needs to be adjusted	Select *Brightness/Contrast* screen to change the brightness.
	The lightbar has locked up	Disconnect power, wait 30 seconds, and then reapply power.
	Contrast is wrong	Press and hold OK as you reapply power. Contrast is reset to the default value.
	No power	Make sure that the lightbar is connected to a power source.
I need to reset the start of the first swath	You have mapped the start of the first swath at the wrong time	Press ▲ to select the **A** icon and then press OK to reset Point A.
My lightbar LEDs, buttons, or screen do not appear to be working properly	There is a fault with the hardware	Run hardware tests. From the *Lightbar* menu, select *Tests*. Run any or all of the tests. If any of the tests fail, contact your local reseller for information on repairing or replacing the lightbar.
NO GPS COMMS	The lightbar is not communicating with the integrated GPS receiver	The GPS receiver or lightbar is faulty. Contact your local reseller for information about repairing or replacing the faulty item.
	The external GPS receiver is not connected to the lightbar	Connect the external GPS receiver to the data port on the lightbar. In the *Data Port Settings* screen, set *Input* to External GPS or TSIP Receiver. To use the integrated GPS receiver, set the Data Port *Input* field to None.
NO GPS POSITIONS message flashes on screen	The antenna is not connected to the lightbar	Connect the antenna to the lightbar or to the external GPS receiver. See **Installing the system, page 11**.
	The antenna, antenna cable, or GPS antenna connection is faulty	From the *Configuration* menu, select *GPS / GPS Diagnostics*. Press ▲. If the *Antenna* option displays **None**, there is a problem with the antenna, antenna cable, or the GPS antenna connection. Contact your local reseller for information about repairing or replacing the faulty item.

Problem	Possible cause	Solution
FEW SATELLITES message flashes on screen	Part of the sky is blocked from the view of the antenna. When you power on the receiver, it may take 1-2 minutes to acquire enough satellites.	Move to a location where you have a clear view of the sky. Make sure that the antenna is not obstructed.
INVALID GPS message flashes on screen	The external GPS receiver is not outputting NMEA GGA messages.	Configure the receiver to output NMEA GGA and VTG at 5 Hz, 38400, 8N1.
LOW ACCURACY No Corrections message flashes on screen	The receiver is not getting correction signals.	Move the vehicle away from trees and/or buildings. Or, change the *Low Acc Warning* option to No Warning to enable guidance without corrections.
LOW ACCURACY High HDOP message flashes on screen	The Horizontal Dilution of Precision (HDOP) measure of accuracy is too high.	HDOP is affected by the relative position of satellites in the sky. If a portion of the sky is blocked from view, the HDOP may increase. Move the vehicle away from trees and/or buildings. Alternatively, change the *Low Acc Warning* option to No Warning to enable guidance with a high HDOP.
LOW ACCURACY Old Correction message flashes on screen	It is a long time since the receiver received a correction signal.	Move the vehicle away from trees and/or buildings. Or, change the *Low Acc Warning* option to No Warning to enable guidance without corrections.
Searching Sats (0) message flashes on screen for more than 2 minutes	The antenna is not connected to the lightbar properly.	Check that the antenna is properly connected to the lightbar.
	You have a damaged antenna or antenna cable.	Select *GPS / GPS Diagnostics* and view the antenna status. If it reports **None** or **Short Circuit**, you have a damaged antenna or antenna cable. Contact your local reseller to arrange for the faulty item to be repaired or replaced.
The configuration settings are not saved	You have cycled power while still in the configuration menus.	Configuration changes are not saved until you exit from the configuration menus and return to guidance. To ensure that your changes are saved, always exit the configuration menus before you disconnect power from the lightbar.
The lightbar has suspended operation	The lightbar has not been used for some time so has suspended operation to conserve battery power.	Press any key to activate the lightbar. Make sure that you disconnect power from the lightbar when it is not in use for long periods of time.

Problem	Possible cause	Solution
A single LED is flashing	The ambient temperature is outside the lightbar temperature range	If it is cold, turn on the heater in the cab. If it is hot, turn on the air conditioning. If sun is shining directly on the lightbar, shade the lightbar from the sunlight.
The lightbar is not securely mounted	The suction cup is a temporary mounting device	Pump the suction cup each day or when the red line appears. Glue the suction cup to the window. Mount the lightbar bracket directly on the dash, ceiling, or window. For more information, see **page 11**.
Coverage area value is not saved over a power cycle	Guidance was not paused before power was disconnected.	Always pause guidance before disconnecting power.
The lightbar will not work after lunch	The lightbar will not work if it gets too hot. When you take a break, do not leave the lightbar where it may become very hot, such as in direct sunlight.	To enable normal operation, reduce the temperature of the lightbar by turning on the vehicle air conditioning or shielding the lightbar from direct sunlight.
The **IN HEADLAND!** warning is not displayed	The **IN HEADLAND!** warning only appears if your antenna offset is set to 0.	You can achieve a similar effect by setting the **HEADLAND!** warning lead time to greater than 0 (for example, 3 seconds). The **HEADLAND!** warning will then appear before the headland is reached.

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