

RELEASE NOTES

EZ-Guide® 500 Lightbar Guidance System Firmware Version 5.00

- [Introduction](#)
- [Changes](#)
- [Updates](#)
- [Upgrade procedure](#)

Version 5.00
Revision A
September 2009
Part Number 66022-85-ENG



Contact information

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(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

Trimble Navigation Limited

935 Stewart Drive

Sunnyvale CA 94085

Telephone: 1-408 481 8000

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Avis de conformité à la réglementation d'Industrie Canada.

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Declaration of Conformity

We, Trimble Navigation Limited,

935 Stewart Drive
PO Box 3642
Sunnyvale, CA 94088-3642
United States
+1-408-481-8000

declare under sole responsibility that the product:
EZ-Guide 500 lightbar guidance system
complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received,
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Introduction

These *Release Notes* describe changes and updates for the EZ-Guide® 500 lightbar guidance system. They apply to the EZ-Guide 500 lightbar guidance system firmware version 5.00.

Changes

The following changes are provided in the EZ-Guide 500 lightbar guidance system firmware version 5.00:

- [Manure spreading tracking and reporting](#)
- [Boundary recording](#)
- [SwathFinder](#)
- [Headland/Infill Switching](#)
- [10 Hz GPS rate](#)
- [Summary Report Enhancements](#)

These changes are described in more detail on the following pages.

Manure spreading tracking and reporting

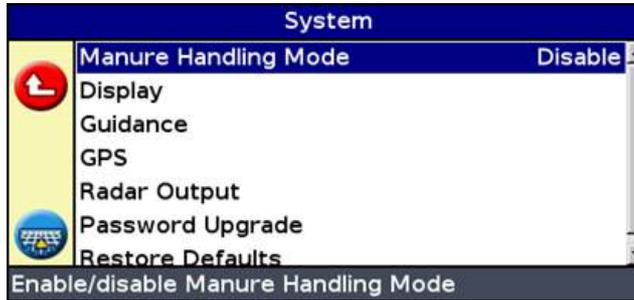
The EZ-Guide 500 Lightbar Guidance System now allows you to enter manure handling records to satisfy regulatory requirements. Use this option to easily track the location of the area covered, along with the volume per area and other important data points.

When this feature is enabled, you can enter the rate and units being applied for each field. This value will then appear in the Summary Report for that field. When you are finished, you can transfer the Summary Report to a computer through a USB connection.

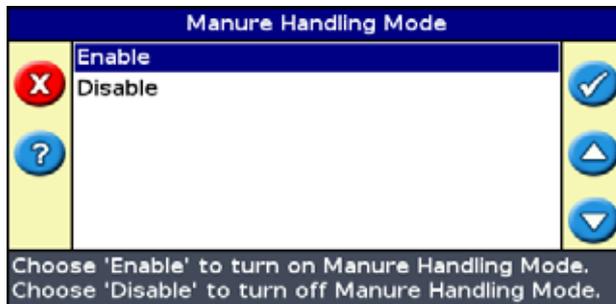
Note – *You can enter only one rate per field. No variability within the field is taken into account.*

Enabling manure handling mode

1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / Manure Handling Mode*:



4. Select *Enable*:



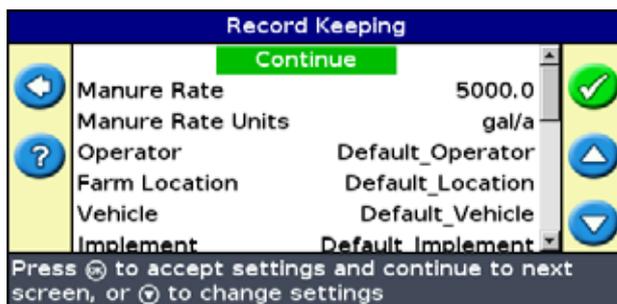
Using manure handling mode

When manure handling mode is enabled, you can enter the application rate and units you are using for each field in the Summary Report.

To do this:

1. From the main guidance screen, select the  icon and then create a new field or select an existing field.
2. Select the field pattern, implement setup, and field name.

-
3. Enter the manure application rate and units in the *Record Keeping* screen:



Unit options are:

- Metric:
 - l\ha
 - kg\ha
 - tonnes\ha
 - custom
- Imperial/US:
 - gal\a
 - lbs\a
 - tons\a
 - custom

Use the custom setting if the units you want to use do not appear in the list. In that case, 'Custom' appears in the summary report – but you can add the appropriate value yourself if you wish.

4. To view the summary report with this information, transfer the summary report to your PC. To do this, from the main guidance screen select the  icon and then press . Select *Data Management* and then select *Send Summary Reports to USB*.

The Summary Report is on the USB drive in the AgGPS\Summaries\Client folder)\(Farm folder)\(Field Folder)\(Event folder).

An example report, with manure handling information highlighted, is shown below:

| EZ-Guide [®] Event Summary Report | | SOUTHFIELD_EZ23456 - SPRAYING_EZ23456 |
|---|------------------------------|--|
| <i>Event Details</i> | | |
| Client Name | J SMITH | |
| Farm Name | MEADOWBROOK | |
| Field Name | SOUTHFIELD_EZ23456 | |
| Event Name | SPRAYING_EZ23456 | |
| Operator | Default_Operator | |
| Event Created | 09 14 10:51:40 2009 | |
| Summary Created | 09 14 10:52:14 2009 | |
| Field Area | N/A | |
| Productive Area | N/A | |
| Field Latitude/Longitude | 55°15'15.36"N 119°19'13.04"W | |
| Total Time | 00h 00m 40.0s | |
| Farm Location | Default_Location | |
| Application Method | Default_AppMethod | |
| <i>Coverage</i> | | |
| Start Time | 09 14 10:51:44 2009 | |
| End Time | 09 14 10:51:50 2009 | |
| Coverage Time | 00h 00m 07.62s | |
| Coverage Area | 0.3416 a | |
| Applied Volume | 0.00 gal | |
| <i>Equipment</i> | | |
| Vehicle | Default_Vehicle | |
| Implement | Default_Implement | |
| Implement Width | 60' 00" | |
| Number of Sections | 1 | |
| <i>Environmental Conditions</i> | | |
| Soil Conditions | Default_Soil | |
| Soil Type | Default_SoilType | |
| Temperature | 59.0 °F | |
| Humidity | 50% | |
| Wind Speed | 0.0 mph | |
| Wind Direction | Default_WindDir | |
| Wind Gust Speed | 0.0 mph | |
| Sky Conditions | Default_Sky | |
| <i>Manure Handling</i> | | |
| Manure Rate | 5000.0 | |
| Manure Rate Units | gal/a | |
| <i>Miscellaneous</i> | | |
| Custom1 | Default_Custom1 | |
| Custom2 | Default_Custom2 | |
| Custom3 | Default_Custom3 | |
| Custom4 | Default_Custom4 | |

Note – When manure handling is disabled, there is no information about manure handling in the Summary Report.

Boundary recording

The EZ-Guide 500 Lightbar Guidance System now allows you to create boundaries in any field with any pattern type. All boundaries are displayed on the run screen and the summary report. Create, import, or reuse a boundary for each of your fields to provide accurate acre counts.



When using the AgGPS® EZ-Boom® 2010 application control system, you can also use boundaries to set the areas you wish to apply material to. Once you have recorded the boundary, EZ-Boom applies inside the boundary only. The application automatically switches off when the vehicle moves outside the boundary.



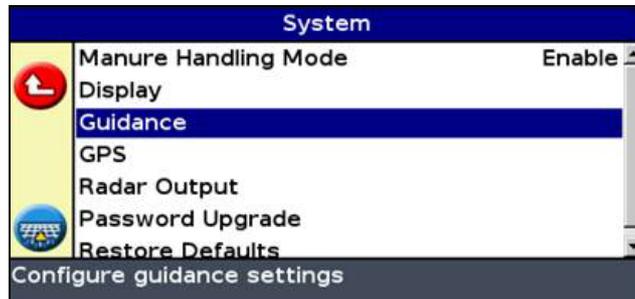
Tip – You can record multiple boundaries in a single field. When reloading a field with one or more boundaries present, all boundaries are automatically loaded.

Note – When creating a Headland pattern, a boundary is automatically created around the outside pass. For all other pattern types, you can add a boundary.

Note – Boundary recording is available in Advanced mode only.

Enabling and disabling boundaries

1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / Guidance*:



4. Select *Boundary Setup*:



5. Select *Boundaries*.

6. Select the appropriate option:

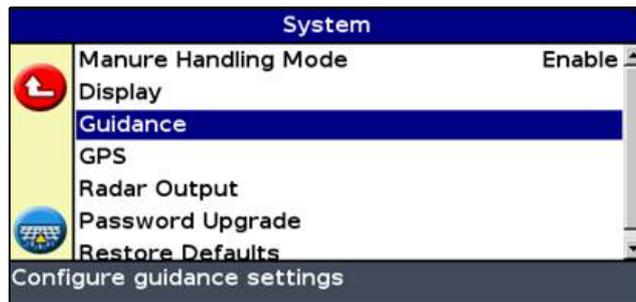


| If you select... | Then |
|--------------------------------|--|
| <i>Enabled</i> | boundaries are enabled for all fields. A screen asks if you want to record a boundary or not when: <ul style="list-style-type: none">• Starting a new field• Opening an existing field• Adding an AB line to the currently open field• Selecting a different AB line in the currently open field Select the appropriate option. |
| <i>Disabled for This Field</i> | boundaries are switched off for the current field you are working in. The option automatically changes to <i>Enabled</i> when you begin your next field. To use the <i>Disabled for This Field</i> option for the next field, you must make this selection again. |
| <i>Disabled for All Fields</i> | boundaries are switched off for all fields. This option remains active in all fields until you select another option. |

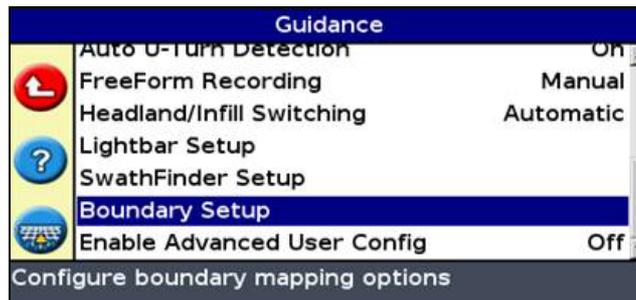
Expand boundary option

Use the Expand Boundary option to determine how the boundary will be altered after you finish recording a boundary.

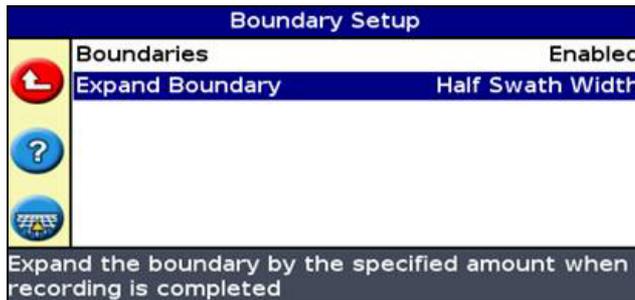
1. From the main guidance screen, select the  icon and then press **OK**. The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / Guidance*:



4. Select *Boundary Setup*:



- Select *Expand Boundary*:



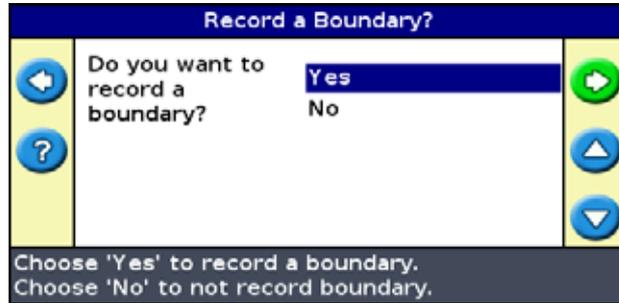
- Select the appropriate option:



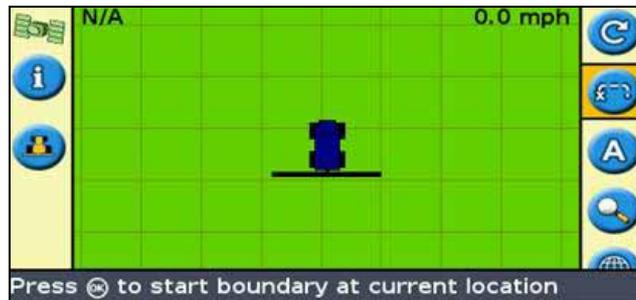
| Select... | To |
|-------------------------|--|
| <i>Do Not Expand</i> | prevent the boundary being altered once you have finished recording. The boundary remains in the same place as you recorded it. |
| <i>Half Swath Width</i> | expand the boundary by one half a swath width toward the outside of the pass. The boundary expands once you have finished recording. |
| <i>One Swath Width</i> | expand the boundary by one full swath width toward the outside of the pass. The boundary expands once you have finished recording. |

Recording a boundary

1. From the main guidance screen, select the  icon and then create a new field or select an existing field.
2. Step through the wizard until you reach the *Record a Boundary?* screen:

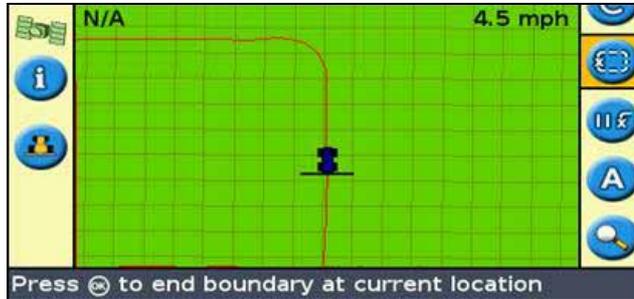


3. Select *Yes*.
4. Continue through the wizard until you return to the main guidance screen.
5. On the main guidance screen, select the  icon and then press . This begins mapping the boundary:

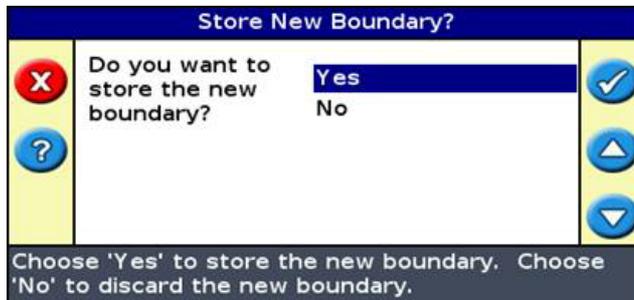


Tip – To pause recording at any time, for example to navigate around an obstacle such as rocks, press the  icon and then press . To resume recording, press the  icon and then press . A straight line connects your current position with the last recorded point before you paused.

-
6. Drive the entire length of your boundary to record it accurately. As you are doing this, you can also set your guidance line.
 7. When you have finished mapping the boundary, select the  icon and then press . This ends mapping the boundary:



8. To save the new boundary, select *Yes* on the *Store New Boundary?* screen:



The boundary is saved.

If you select *No*, the boundary is discarded and you are returned to the main map screen where you can record the boundary again.

Note – *You must manually close the boundary. It does not close automatically when you drive back to the start point.*

Boundaries and the pivot pattern

Pivot boundaries behave differently in easy and advanced modes:

| In... | When you create a pivot... |
|---------------|---|
| Easy mode | the boundary is automatically generated. |
| Advanced mode | you must record your own boundary. (It is not automatically generated.) |

Note – This includes all fields, including those created with earlier versions of firmware.

SwathFinder

The EZ-Guide 500 Lightbar Guidance System now helps guide you safely from one swath to another by providing a turning path connecting the two swaths. The SwathFinder option improves turns and accuracy in finding the entry point to the next AB line. It is available for AB, A+, Headland AB, and Headland A+ field pattern types.



You can choose how large the turn is, how far ahead of the vehicle the turn is when it is created, and you can choose to skip a set number of swaths.

Note – SwathFinder is available in both Easy and Advanced mode. However, to enable SwathFinder you must be in Advanced mode.



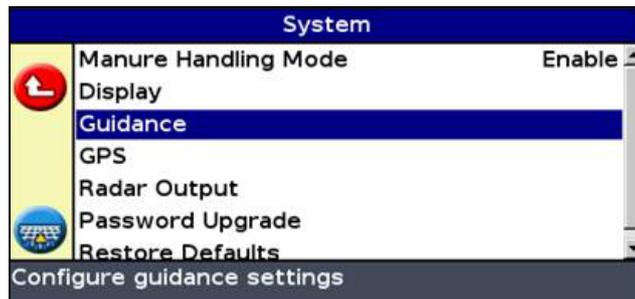
CAUTION – No LED guidance or auto-steering is provided on these turns, this option only gives you an on-screen indication of where you need to place your vehicle.

Notes –

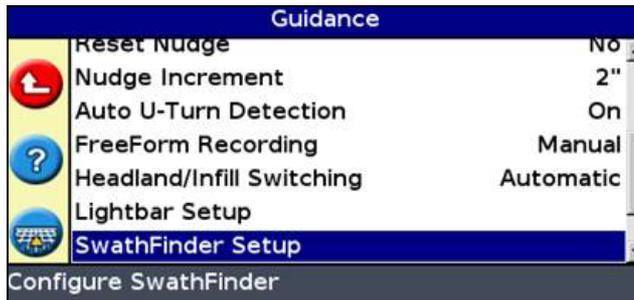
- *SwathFinder turns are generated to support standard left/right style swathing across the field. "Racetrack" type patterns (where you always turn in the same direction) are not supported.*
- *SwathFinder turns are automatically generated in the opposite direction to the last SwathFinder turn. If you need to change the direction of the SwathFinder turn, use the appropriate icon ( or ) on the right hand side of the main map screen.*
- *By default, the SwathFinder turn is generated at the end of the field. You can force the turn to generate at any point along the swath by turning coverage logging off or disengaging autosteering. This is useful if the field is an irregular shape.*

Enabling and configuring SwathFinder

1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / Guidance*:



4. Select *SwathFinder Setup*:



5. Select *Enable SwathFinder*:



6. When you enable SwathFinder, you automatically return to the *SwathFinder Setup* screen where you can adjust the following settings:



| Setting | Description |
|---------------------------------|--|
| <i>Turn Size</i> | Determines the size of the SwathFinder turn generated when SwathFinder is enabled. Choose a turn size to suit your vehicle, for example use a larger number for large vehicles pulling large implements that must make “keyhole” shaped turns; use a smaller number for vehicles able to make tighter turns. |
| <i>Turn Ahead Distance</i> | Causes the SwathFinder turn to be generated a set distance from the end of the field. Choose a larger distance if you need more length to prepare for the turn. Note – <i>The Turn Ahead Distance is added automatically if you stop coverage recording or disengage autosteering, which causes a SwathFinder turn to be generated before or after the end of the field.</i> |
| <i>Number of Swaths to Skip</i> | Allows you to choose the number of swaths that are skipped each time a SwathFinder turn is generated. For example, if you are driving every second swath in the field, then enter 1. Note – <i>When skipping swaths, the SwathFinder turns still alternate left/right between each swath.</i> |

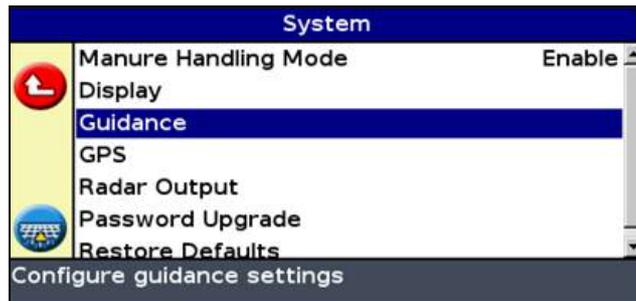
Headland/Infill Switching

The EZ-Guide 500 Lightbar Guidance System now allows you to choose how guidance switches between the headland and infill part of the field. The options are automatic or manual.

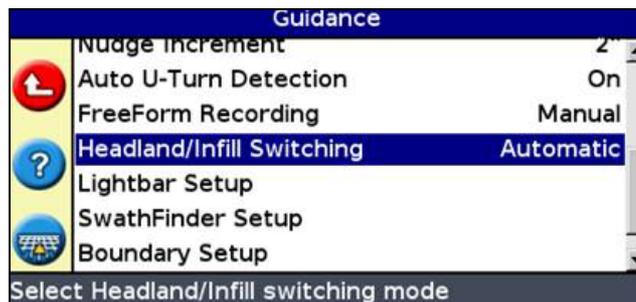
Note – Headland/Infill switching is available in both Easy and Advanced mode. However, to enable it you must be in Advanced mode.

Selecting Automatic or Manual mode

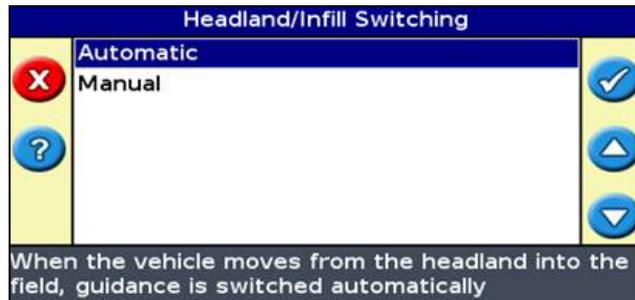
1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / Guidance*:



4. Select *Headland/Infill Switching*:



-
5. Select one of the following:



| Option | Description |
|------------------|--|
| <i>Automatic</i> | Guidance automatically switches from headland to infill when the vehicle moves inside the inner headland boundary. This option provides the same operation as previous versions of the EZ-Guide firmware. |
| <i>Manual</i> | You choose when the guidance switches from headland to infill, and vice versa. To switch, select the appropriate icon on the main map screen and then press OK , as shown below. Note – When reopening a field while the Headland/Infill switching option is set to manual, you must select the headland and not the infill guidance line. If this is not done, the manual switching does not work. |

Manually selecting the headland or infill swath

In the screen below, guidance is currently snapped to the infill swaths, indicated by the  icon at the top of the screen:



To switch to headland guidance, select the  icon and then press .

In the screen below, guidance is currently snapped to the headland swaths, indicated by the  icon at the top of the screen:



To switch to infill guidance, select the  icon and then press .

10 Hz GPS rate

By default the GPS receiver now operates at 10 Hz. You can also output NMEA messages at rates up to 10 Hz, enabling the EZ-Guide 500 Lightbar Guidance System to work with newer third-party hardware.

To do this:

1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *System / GPS / NMEA Output*.
4. Step through the wizard to set NMEA messages to the desired output rate:



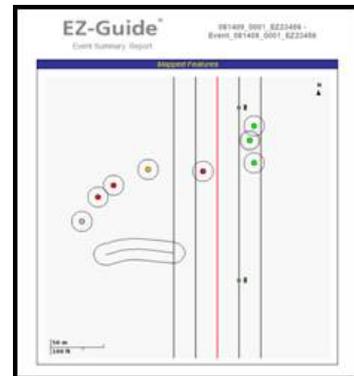
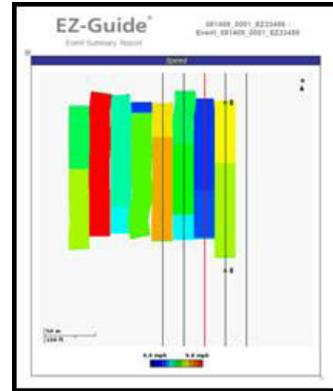
Summary Report Enhancements

Additional Summary Report pages

You can now include the following additional maps in the Summary Report:

- Speed Map, which provides swath speed variations for coverage effectiveness.
- a Mapped Features Map, so that you can see mapped features such as rocks or weeds.

***Note** – The warning circles for each feature are also displayed on the map.*



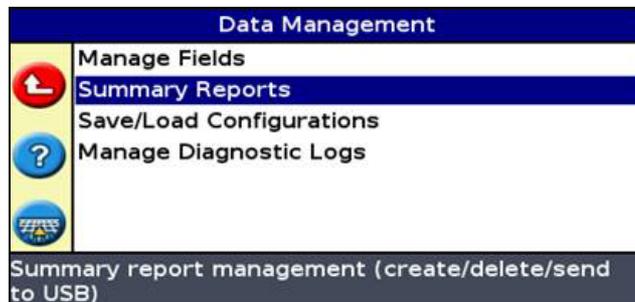
***Note** – Summary reports are created automatically when a field containing coverage is closed.*

Summary Report menu now easier to access

The *Summary Report* menu is now in the *Data Management* menu, for easier access.

To view the Summary Report:

1. From the main guidance screen, select the  icon and then press . The *Configuration* screen appears.
2. Make sure that the user mode is set to Advanced.
3. Select *Data Management / Summary Reports*:



4. Select the appropriate option:



Note – To manually create a summary report for the field that is currently open, select *Create Summary Report Now*.

To send previously created Summary Reports to the USB drive select *Send Summary Reports to USB*. The Summary Report is on the USB drive in the following folder: AgGPS\Summaries\((Client folder)\(Farm folder)\(Field Folder)\(Event folder).

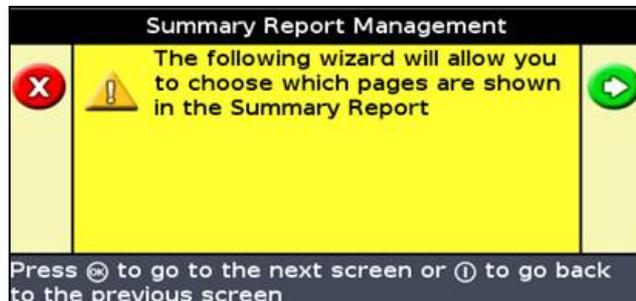
Individual Summary Report pages can now be exported

You can now choose whether to export and show the following pages in the summary report:

- Event Summary
- Overlap
- Height
- Applied Rate
- Speed
- Mapped Features

To choose the pages to include:

1. Follow steps 1 through 4 above.
2. Select *Choose Summary Report Pages* and then step through the wizard to select the pages to include in the Summary Report:



-
3. Select *Yes* to include the page in the report, or select *No* to omit the page from the report:



***Note** – All Summary Reports created from this point contain the selected pages. Previously created Summary Reports are not updated automatically. To update a Summary Report with the new page selection, you must reopen the field and recreate the Summary Report.*

Updates

The following updates are provided in the EZ-Guide 500 lightbar guidance system firmware version 5.00:

- [Freeform status icons](#)
- [Port conflict detection](#)
- [EZ-Steer calibration wizard changes](#)
- [OmniSTAR convergence accuracy estimate](#)

These updates are described in more detail on the following pages.

Freeform status icons

You can now quickly and easily determine which FreeForm state you are in. Quick reference icons appear on the map screen to allow you to monitor pattern and recording status for more efficient Freeform operations:

| Icon | Indicates... |
|---|--|
| AB Mode  | you are currently in straight AB guidance mode. |
| FreeForm Mode  | you are currently in FreeForm Guidance mode. |
| FreeForm Recording  | you are recording your current FreeForm guidance path. Note – No icon is shown when you are not recording. |

Port conflict detection

A warning now appears in the NMEA output wizard when there is a port conflict due to a serial VR controller using the same port you are trying to configure.

EZ-Steer calibration wizard changes

The EZ-Steer® assisted steering system calibration wizard now features override sensitivity as well as approach aggressiveness.

OmniSTAR convergence accuracy estimate

An additional page in the OmniSTAR XP/HP setup wizard now enables you to select the Engage Accuracy level when using guidance, creating AB lines, creating boundaries, and so on.

The Engage Accuracy level options are:

| Option | Description |
|--------------------------|---|
| <i>Pass to Pass</i> | Provides an accuracy estimate equivalent to pass to pass accuracy, which is measured as the position drift over a 15-minute period. This option provides a faster convergence time but has the potential for more position drift. |
| <i>Absolute Accuracy</i> | Provides a convergence estimate closer to absolute accuracy. The convergence time is longer but the position drift is reduced. |

In previous versions of firmware, the OmniSTAR convergence level was reported differently when comparing the EZ-guide 500 system with the AgGPS 252 or 332 receivers. In this version, if you select the Pass to Pass option the convergence estimate matches that of the 252/332 receiver.

Note – Only the reported convergence estimate is affected by this change. OmniSTAR performance and convergence time is not affected.

Upgrade procedure

Downgrading the firmware

If it is necessary to downgrade the firmware, you must ensure the receiver is calculating a good GPS position before you begin the downgrade.

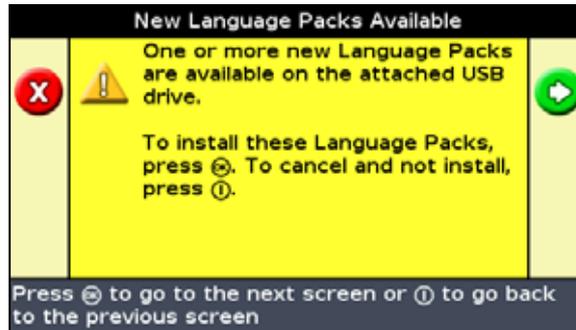
Installing additional language packs



CAUTION – Do not add language packs to the lightbar when the internal memory is nearly full (less than 15 hours remaining). To free up internal memory, save all of the data to a USB drive and then copy the data on the drive to an office computer. Delete the field data from the internal memory. Install the language packs and then, if necessary, use the drive to replace the field data in the lightbar's internal memory.

A number of language packs are available as a web release. Language packs are loaded onto the lightbar from a USB drive:

1. Transfer the required language pack (.lpf file) from www.ez-guide.com to an office computer.
2. Copy the language pack to a USB drive and then insert the USB drive into the USB port on the lightbar. Make sure the files are copied to the root of the USB drive, not to any folders on the USB drive.
3. Turn on the lightbar.
4. Select the main guidance screen and then wait for up to 1 minute. The language pack is automatically detected:



5. Press **OK** to load the language pack(s).
Once the language pack is installed, the language selection screen appears.

-
6. Select the language you require:



Upgrading the firmware

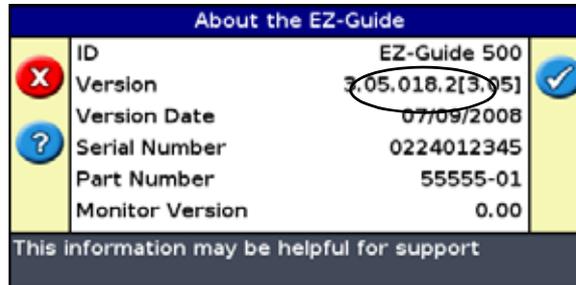


CAUTION – Do not upgrade the lightbar’s firmware when the internal memory is nearly full (less than 15 hours remaining). If you do, the lightbar may lose your current settings. Before upgrading the firmware, save the lightbar’s settings and the data to a USB drive and then transfer all of the data on the drive to an office computer. If necessary, use the drive to replace the field data in the lightbar’s internal memory after the upgrade is complete.

Note – Before upgrading to version 5.00 of the EZ-Guide 500 system, make sure that you are using the AgGPS Autopilot™ automated steering system version 4.52 or later.

Before you begin to update the firmware in the lightbar, check which firmware version is currently installed:

1. Select *Configuration / About the EZ-Guide*.
2. Check the *Version* number:



This is the firmware version. If the number is 4.05.xxx.x, you have firmware version 4.05. If the number is 5.00.xxx.x, you already have firmware version 5.00.

To upgrade the lightbar to version 5.00:

1. Download the firmware version 5.00 upgrade file from www.EZ-Guide.com to your office computer.
2. Extract the contents to the USB drive. Make sure the files are copied to the root of the USB drive, not to any folders on the USB drive.
3. Insert the USB drive in the lightbar.
4. Turn on the lightbar.

When the USB drive is detected, the lightbar runs the upgrade wizard automatically.

If you currently have firmware version 4.05 or earlier, the firmware version 5.00 upgrade file appears:



CAUTION – Do not turn the lightbar off while the firmware is being updated. This could render the lightbar inoperable.

5. Select the EZ-Guide firmware .img file and then press **OK**. The wizard installs the monitor file and the firmware version 5.00. When the firmware is installed, the lightbar restarts.

The lightbar firmware is upgraded to version 5.00.

