Outback GUIDANCE

Outback MAX

User Guide

Part No. 875-0354-000 Rev C1

AgJunction

This device complies with part 15 of the 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, including interference that may cause undesired operation.

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Dealer Support

Contact your dealer for technical assistance. To find the authorized dealer near you:

Phone: (800) 247-3808
outbacksales@outbackguidance.com

Outback Guidance Customer Service

If you need to contact Outback Guidance Customer Service:

North America

Outback Guidance
AgJunction
2207 Iowa Street
Hiawatha, KS 66434
Phone: (800) 247-3808
Fax: (785) 742-4584
outbackCS@outbackguidance.com

Outback Canada
326 Saulteaux Crescent
Winnipeg, MB R3J 3T2
Phone: (866) 888-4472
Fax: (204) 888-0991

Australia

Outback Australia
Unit 5A, 305 Montague Road
West End, QLD 4101
Phone: (07) 3004 6789
Fax: (07) 3004 6799
outbackAUCS@outbackguidance.com

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Chapter 1: Introduction

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Overview

Note: Before using Outback MAX™ make sure you have read the Outback MAX Quick Start Guide and have properly installed and powered on Outback MAX and any optional components.

The Outback MAX GPS guidance system features a high-resolution touchscreen, multi-language support, and clear, easy-to-read job data and system status information in real time. Outback MAX provides the following features:

- Simplified user interface

  Precision farming is easier with the Outback MAX user interface. Configure the screen with your favorites or most used functions. Select overhead or bird's eye view angles that provide superior situational awareness.

- Powerful mapping engine

  Farm with the greatest accuracy and most effectively by stacking up to three separate layers of data – prescription, imagery, and as applied maps.

- Beneficial connectivity

  Make the best farming decisions through Outback ConnX™, a web-based system that seamlessly interfaces with and simplifies data transfer between the MAX terminal, office, truck, mobile phone or anywhere with an Internet connection.

As either a first-time or an experienced user of Outback products, you should acquaint yourself with the instructions contained in this user guide. You will find many useful tips and suggestions to help you get the most from your investment.

What's Included

An Outback MAX kit comprises the following components:

- Touchscreen terminal with mounting hardware
- Antenna assembly, cable, and mounting plate
- Required cables, (power cable, I/O cables)
- USB flash drive

Your kit may also include one or more of the following optional components:

- Lightbar
- Switchbox
- Foot switch
- RTK kit (base station and rover antennas)
- Cell modem
- Video cable (for use with user-supplied cameras)
- eDriveXC or eDriveXD automated steering
- AC110 section/rate control system

Refer to the Outback MAX Quick Start Guide for more information on all the components of your Outback MAX system.

Starting Outback MAX

This section describes how to start Outback MAX the first time.

Starting Outback MAX the First Time

To start Outback MAX:

1. Power up Outback MAX. If you have any additional components connected to Outback MAX power them up as well. Upon powerup Outback MAX completes a self test and the screen at right appears.

   Upon startup Outback MAX starts acquiring a DGPS signal (as long as the antenna has a clear view of the sky)—this may take several minutes, during which time the vehicle can be moving and you can perform certain functions.

   - Upon acquiring a GPS position, on the Indicator tab the satellite icon changes from red to orange and “3d” indicates a 3-dimensional solution (top figure at right).
   - Upon acquiring a DGPS position, the satellite icon turns green and “3D” indicates a differentially corrected 3-dimensional solution (middle figure at right).

GPS

DGPS

RTK

   - Upon acquiring an RTK position (with optional RTK equipment) the Indicator tab displays “RTK” (bottom figure above right).

   Note: MAX must have a GPS position to begin a job and provide guidance.

2. Press **I Accept**. The Start Up Menu appears.

   The Start Up Menu window includes read-only fields for the current vehicle, current implement, and last job number.

   When you start Outback MAX for the first time only the Vehicle Profiles, Implement Profiles, and Skip buttons appear; you will not see any ‘job’ buttons. You must define a vehicle and an implement before any job functionality is enabled.

3. Press **Vehicle Profiles** to start adding a vehicle. See “Working with Vehicles” on page 66 for information on adding a vehicle as well as information to keep in mind before adding a vehicle.

   or

   Press **Implement Profiles** to start adding an implement. See “Working with Implements” on page 75 for information on adding an implement.

   or

   Press **Skip** to go straight to the map screen. You can start here to familiarize yourself with the Outback MAX touchscreen interface. However, you must still add a vehicle and implement before beginning a job.

Starting Outback MAX after Working with a Job

After you have worked with a job different options appear on the Start Up Menu the next time you power up Outback MAX. The Start Up menu still includes the read-only fields for the current vehicle, current implement, and last job number but instead it includes the following buttons:

- **New Job** - press to begin a new job. Outback MAX automatically assigns a job name (see “Starting a New Job” on page 106).
- **Previous Jobs** - press to display the Previous Jobs panel where you can select a previous job number (see “Loading a Previous Job” on page 107).
- **Continue Job** - press to have Outback MAX load the most recently performed job—the job number displayed under Last Job (see “Loading a Previous Job” on page 107).
- **Skip** - press to start working with Outback MAX with no job.

See Chapter 5, “Jobs and Job Templates” for information on working with jobs.

Terminal Buttons

The Outback MAX terminal includes four buttons to the right of the touchscreen.

The Steering and Favorites buttons on the touchscreen perform the same functions as the Steering and Favorites buttons on the terminal.

Note: When you insert a USB drive (with a “Screenshots” folder at the root level) the Favorites button on the terminal (not the touchscreen button) functions as a screen capture tool, saving a capture of the entire screen as a .png file in the screenshots folder on the USB drive. See “Capturing Screen Images” on page 264 for more information.

Outback MAX Touchscreen

The Outback MAX touchscreen consists of the following:

- Map screen - a moving graphical representation of the field operation. You can use zoom features and steering indicators, as well as view the applied area total for quick reference.
- Buttons and indicators - these appear along the edges of the display and provide quick access to settings, allow you to zoom in and out on the field, and show current navigation values.

Figure 1-1: Outback MAX touchscreen

Table 1-1 describes the map screen controls shown in Figure 1-1 and includes links to other sections in this manual with more detailed information on these controls.

Table 1-1: Outback MAX touchscreen items

Screen Item	Description
	Onscreen lightbar Provides visual cues to stay on a guidance line: • Red bars left of center indicate you need to steer to the right. As you steer to the right the red bars change to gray (from left to right). • Green bars right of center indicate you need to steer to the left. As you steer to the left the green bars change to gray (from right to left).
	Indicator tab • Displays information in upper right of screen. • By default only the top row appears on the screen. Press the tab to display all three rows; press the tab again to hide the two bottom rows. See “Indicator Tab” on page 10.
	Zoom buttons • Press the Zoom Out (minus) button to zoom out on the field (vehicle appears smaller). • Press the Zoom in (plus) button to zoom in on the field (vehicle appears larger). See “Zooming In and Out on the Map Screen” on page 13.
	Vehicle indicator (representation of selected vehicle) The triangle on the vehicle center points in the direction of travel. If the vehicle on the screen is moving opposite to your actual direction of travel double-tap the vehicle to reverse the vehicle direction on the screen. See “Working with Vehicles” on page 66.
 No offset 2 m offset	Implement indicator • Can be either a trailed or rigid implement • Width of actual implement is indicated by width of implement indicator (for example, a wider implement will appear wider onscreen than a narrower implement). • You can set an offset—how far behind (back) or in front of the vehicle the implement will be, and this is represented graphically onscreen (figures at left show no offset and a rear offset). See “Working with Implements” on page 75.

Table 1-1: Outback MAX touchscreen items *(continued)*

Screen Item	Description
	Guidance line Imaginary line (path) upon which Outback MAX guides your vehicle. See “Setting Paths” on page 131.
	Cross Track error Distance from your current driving position to your guidance line. For example, if you are driving an A=B line and you veer to the right and are off your line by 6 inches, your cross track error is 6 inches.
	ISOVT Displays the ISO VT window, where you work with ISOBUS-enabled implements. See “ISO VT” on page 43.
	Mapping Options button Displays the Mapping Options panel where you set map view and perspective, map layers, event markers, and return to point options. See “Mapping Options” on page 116.
	Path Planning button Displays the Path Planning panel, where you set or adjust paths, select a previous path, and select eTurns. See Chapter 7, “Path Planning and Boundaries”

Table 1-1: Outback MAX touchscreen items *(continued)*

Screen Item	Description
Not connected (no Steering button visible) Not ready to engage (errors if exclamation point visible) Ready to engage Pre-engage available Engaged	Steering button This button appears on the lower middle of the map screen if a steering controller is connected. If no steering controller is connected, the button does not appear. When a steering controller is connected, states are: • Not ready to engage (errors if exclamation present - see “eDriveX Status” on page 241) • Ready to engage • Pre-engage • Engaged
Apply Off Apply On	Apply button Select to have Outback MAX log application or coverage data for the current job. Press this button (or press the foot switch) to stop or hold logging job data: • On (green button) indicates data logging • Off (blue button) indicates no data logging
	Camera button Displays the Camera window, where you can view: • Each camera individually in default view (small window). • Each camera individually in full screen view (window fills the screen). • All four cameras at once (fills the screen). • Flip any camera image horizontally (mirror image). See “Using External Cameras” on page 212.
	Menu button Displays the Menu Options panel (main panel—highest level of panels from which all options are accessible).

Table 1-1: Outback MAX touchscreen items *(continued)*

Screen Item	Description
Contour Lock Off Contour Lock On Contour Lock locked eTurns inactive eTurns ready Favorites	Contour Lock or eTurns button: • Contour Lock button displayed when in Contour mode. • eTurns button displayed when A=B guidelines are displayed. • Favorites button displayed if not in A=B guidance or Contour guidance mode. Press to display the Favorites panel. See “Contour Lock” on page 153, “eTurns” on page 156, and “Favorites” on page 14.
	Headland alert indicator Appears in the upper left of the map screen any time the implement crosses into a previously applied area. See “Setting the Headland Alert” on page 18.
	Zoom distance (lower left of screen, above ISOVT button) Distance between onscreen grid lines (value increases as you zoom out and decreases as you zoom in). See “Zooming In and Out on the Map Screen” on page 13.
	WiFi connection indicator (lower left of screen, below Zoom Out indicator) Indicates the MAX terminal is connected to a wireless access point. See “Networking” on page 31.
	These tabs appear only if you have AC110 installed and you have configured the following: • Rate control—top tab (Product Details) appears. • Section control—bottom two tabs (Sections and Boom Override) appear. See Chapter 8, “Rate Control and Section Control.”
	ISO VT window Virtual terminal window for an ISOBUS-enabled implement that is connected to (and recognized by) Outback MAX. The contents of the window are determined by the implement's manufacturer. See “ISO VT” on page 43.

Indicator Tab

The Indicator tab (Figure 1-2) displays three rows of commonly used read-only information at the top right of the map screen. By default only the top row appears (left figure below). Press the Indicator tab to display all three rows (right figure below); press the tab again to hide the two bottom rows. Table 1-2 describes each row of the Indicator tab.

Default (top row)

Expanded (all three rows)

Figure 1-2: Indicator tab - single row and expanded

Table 1-2: Indicator tab field descriptions

Tab Row	Item	Description
Top (GPS)	Speed	Current speed of the vehicle
	Pass	Pass number Once the A=B line is set, all passes are numbered. Pass 1 is to the right of the A=B line, and Pass -1 to the left.
	Signal (correction) type	Outback MAX is receiving the following signals: • No signal type (blank) = not receiving a GPS signal • 3d = three-dimensional signal • 3D = three-dimensional differential signal (DGPS) • RTK = real time kinematic corrections
	Differential (diff) age	Age of the corrections used in the DGPS correction: • SBAS signals - typically 6 to 10 seconds • RTK - optimal operating values are < 5 seconds
	Signal status	Satellite icon color indicates the following: • Red = no fix on a DGPS signal • Orange = tracking satellites • Green = receiving a GPS signal
	Signal strength	Vertical bars indicate the quality of the GPS signal related to the standard deviation of the solution: • SBAS - 3 to 4 bars are typical • RTK - 4 bars are typical
Middle (location and heading)	Lat	Vehicle's latitude
	Lon	Vehicle's longitude
	Heading	Vehicle's heading
Bottom (job)	Job	Current job number
	Worked	Area of job worked so far
	Field	Field size for the job

Panels

In Outback MAX a panel is a popout tab that appears along the right side of the screen and contains buttons you use to select settings and options on your system. You start by pressing a button on the map screen. Figure 1-3 shows the map screen buttons you can press to display a panel where you can change a setting or display another panel for additional settings.

Figure 1-3: Map screen buttons and resulting panels

When pressed, some buttons on a MAX panel may display another panel. Additionally, at the bottom of each panel a button displays one of the following:

- Back - closes the current panel and displays the previous panel.
- Close - closes the current panel (no panels are visible).
- Save - saves the currently selected options (where applicable).
- Done - completes a selection and returns you to the previous panel.

Tip! *You can close all the panels at once by pressing the Close arrow to the upper left of any panel.*

Figure 1-4 illustrates using multiple panels to set the units of measure as either U.S. or Metric.

Figure 1-4: Outback MAX panels example

The following example (based on the above graphic) shows how to navigate the menus.

1. Press **Menu > Settings > System Preferences > Units**. The Units of Measure panel appears.
2. Press **U.S.** or **Metric** to set the units.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Entering Field Data

Fields/buttons appear in different colors and may or may not show the current setting. Table 1-3 provides descriptions/examples of several Outback MAX field/button types.

Table 1-3: Fields and buttons

Field Type	Example	Function When Pressed
Blue button with no setting value displayed	System Preferences System Preferences	Displays a panel where you select/enter values
Blue button with value setting displayed	Lightbar Brightness Lightbar Brightness: 5	Displays an adjustment window where you set values with a slider or arrows
	Units Units: Metric	Displays buttons to select a value
Green with arrow	Map View Map View: Vehicle	Displays a drop-down list to select a value
White field	IP (part of NTRIP settings) 172.17.29.117	Displays a data entry window where you enter a value

Zooming In and Out on the Map Screen

The display includes two buttons that enable you to zoom in (plus) or zoom out (minus). Press either button as many times as necessary to obtain the desired zoom level. The zoom buttons are located on the left and right of the map screen (left screen below); however, when you display a panel on the right side of the screen the Zoom In button moves to the left side of the screen (right figure below).

Zoom buttons (default location)

Zoom buttons (both on left of screen)

Favorites

Favorites are buttons you use often and want quick access to. Outback MAX includes five favorites on the Favorites panel by default, but you can add favorites (for a maximum of eighteen favorites) or delete favorites.

As shown at right, the Favorites panel is single-width when showing up to nine favorites and it is double-width when showing between ten and eighteen favorites.

Note: Not all buttons can be added to the Favorites panel.

Single-width
(up to 9 favorites)

Double-width
(10 to 18 favorites)

When you add a favorite the button appears on the Favorites panel exactly as it appears in its default location (and the button is still accessible from its default location).

Deleting a favorite only removes the button from the Favorites panel; it does not remove it from its original location. For example, if you delete the New Job button as a Favorite that button is still available on the Jobs panel (after you press Menu > Jobs). You can also delete all favorites if you want to start over and place all new favorites on the panel.

Note: The Favorites terminal button functions as a screen capture button when a USB drive (with Screenshots folder on the drive) is inserted into one of the two USB ports on the MAX terminal. See “Terminal Buttons” on page 4 for more information.

To select (use) a favorite:

1. Press the **Favorites** terminal button to the right of the screen. The Favorites panel appears (top of panel shown at right).
2. Press the desired button.

To add a favorite:

1. Navigate to the button you want to add as a favorite. For example, if you want to add the New Job button as a Favorite press **Menu > Jobs** to display the Jobs panel (which contains the New Job button).
2. Press and hold the desired button for approximately five seconds until the Add to Favorites window appears.

3. Press **Yes**. A confirmation message appears.

4. Press **Ok**. The button is added at the end of the list of buttons (but above the Close button) on the Favorites panel.

To delete a favorite:

1. Press the **Favorites** terminal button to the right of the screen. The Favorites panel appears.
2. Press and hold the desired button for approximately five seconds until the Remove from Favorites window appears.

3. Press **Yes**. The button is removed from the Favorites panel.

Note: If you are not in A=B guidance mode or Contour guidance mode, the Favorites screen button is displayed in the bottom right of the screen (instead of the eTurns button or the Contour Lock button). Press the Favorites screen button to display the Favorites panel. See "Outback MAX Touchscreen" on page 5 for more information.

Configuring the System

Outback MAX has several screens in which you configure important settings before you begin working with vehicles, implement, and jobs.

Settings Overview

From the Settings panel (at right) Outback MAX provides access to multiple panels and screens that enable you to enter/edit settings for a variety of features. Most of the buttons on the Settings panel appear at all times, regardless of what features and functionality you have installed/connected. The Rate Control and eDriveX Settings buttons appear only if you have rate control and eDriveX, respectively, connected to Outback MAX.

To view the Settings panel, press **Menu > Settings**.

Entering System Preferences

Use the System Preferences panel (shown at right) to enter all system preferences settings except for changing the screen brightness.

To display the System Preferences panel, press **Menu > Settings > System Preferences**.

Adjusting the Screen Brightness

Adjust screen brightness using the physical up and down buttons (shown below) located on the front lower right of the terminal. The Up and Down buttons increase and decrease brightness, respectively.

Setting the Language

Your Outback MAX terminal should be set to the language you requested when you ordered the unit. Use the following procedure if you need to change the language.

To set the language:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the Language button displays the current language.
2. Press **Language**. The Select Language panel appears (shown at right).
3. Press the scroll buttons until you see the desired language.
4. Press the desired language button. A message similar to that below appears briefly and the language is changed.

5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Setting Units of Measure

Set the unit of measurement (U.S. or Metric) in which Outback MAX displays and records all measurements.

To set the units of measure:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the Units button displays the current units of measure.
2. Press **Units**. The Units of Measure panel appears (top of panel shown at right).
3. Press the desired button. The Units of Measure panel closes and the selected units of measure appears on the Units button.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Setting the Local Time (GMT Offset)

The default system time is based on GMT. To set your local time enter an offset from GMT. For example, if your local time is seven hours before GMT then set the GMT offset to -7 hr(s). Local time is used for display in debug logs and appears on the GPS Status screen (see “GPS Status” on page 226 for GPS diagnostics information).

To set the local time:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the GMT Offset button displays the current offset.
2. Press **GMT Offset**. The GMT Offset panel appears (top of panel shown at right).
3. Press the down arrow to decrease the offset or press the up arrow to increase the offset (the offset changes in increments of 0.5 hours).
4. Press **Back**. The GMT Offset panel closes and the new offset appears on the GMT Offset button.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Setting the Headland Alert

A headland alert occurs when the implement enters a headland—a previously applied area. The alert is both an audible tone and an indicator that appears in the upper left of the screen (shown at right).

To set the headland alert:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the Headland Alert button displays the current setting.
2. Press **Headland Alert** then press **On** (enable headland alert) or **Off** (disable headland alert).
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Using Night Mode

Night mode provides better ambient lighting for night operations. Figure 1-5 shows the screen with night mode off and on.

Night mode off

Night mode on

Figure 1-5: Night mode off and on

To turn night mode on/off:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the Night Mode button displays the current lighting mode.
2. Press **Night Mode** then press **On** (turn night mode on) or **Off** (turn night mode off).
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Note: Rebooting the terminal resets Night Mode to Off.

Setting Direction Detection

Direction (heading) detection improves the ability of MAX to determine the correct heading direction, especially when switching from forward to reverse (or reverse to forward) by double-tapping the vehicle icon on the map screen. Direction detection is performed by:

- The MAX terminal when no autosteering component is connected
- The eDriveX ECU when eDriveX is connected (more precise direction detection)

Note: Direction Detect is set to On by default. When eDriveX is connected to the terminal, changing the setting to Off has no effect because the eDriveX ECU provides more precise direction detection. When no autosteering component is connected to the terminal, you can set to On or Off (setting to Off will prevent the vehicle icon on the terminal screen from reversing in headlands when changing direction).

To turn direction detection on/off:

1. Press **Menu > Settings > System Preferences**. The System Preferences panel appears and the Direction Detect button displays the current setting.
2. Press **Direction Detect** then press **On** (enable direction detection) or **Off** (disable direction detection).
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

GPS Settings

The first five buttons on the GPS Settings panel are always available and the remaining buttons appear based on the correction type you select. For example, if you select OmniSTAR as the correction type then the OmniSTAR Status and OmniSTAR Settings buttons appear on the panel.

SBAS correction type | RTK correction type | OmniSTAR correction type | e-Dif correction type

Figure 1-6: Correction types and related GPS Settings panel buttons

See “GPS” on page 225 for more information.

You can set/view the following:

- Correction type
- NMEA output
- Subscriptions
- GPS status
- Receiver status
- Correction type-specific buttons (see “Correction Type” on the following page):
  - SBAS Settings (appears only if SBAS is the correction type)
  - RTK Status (appears only if RTK is the correction type)
  - Radio Link (appears only if RTK is the correction type)
  - OmniSTAR Status (appears only if OmniSTAR is the correction type)
  - OmniSTAR Settings (appears only if OmniSTAR is the correction type)
  - e-Dif Status (appears only if e-Dif is the correction type)

Correction Type

See Figure 1-6 on page 20 for an overview of the effect of selecting a specific correction type.

To set the correction type:

1. Press **Menu > Settings > GPS Settings > Correction Type**. The Correction Type panel appears (shown at right).
2. Press the correction type button (labeled RTK in example at right) and select an option from the drop-down.
3. Press **Save**.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

For information on viewing status information for RTK, OmniSTAR, or e-Dif, as well as performing tasks related to the correction type, refer to the following topic. For example, you use the eDif Status screen to verify e-Dif initialization and update an e-Dif point.

- "RTK Status" on page 230
- "OmniSTAR Status" on page 232
- "eDif Status" on page 234

NMEA Output

Use the NMEA panel to set the baud rate and output for available NMEA messages, and turn GLONASS on/off. Various cables and kits are available for specific applications such as yield monitors, rate controllers, and laptop PCs.

For successful communication both Outback MAX and the external application must be configured to communicate similarly. Many applications can use the default settings, while some applications may require different settings. If you select a higher output rate (5 Hz or 10 Hz), you must also select a faster baud rate (19200 or 57600) for proper communication.

Table 1-4 describes the messages you can set using the NMEA panel.

Note: The I/O cable with the GNSS serial port is required for NMEA output (see the Connection Diagram in your Outback MAX Quick Start Guide). Contact your local dealer or Outback Guidance Customer Service for more information.

Table 1-4: Description of NMEA messages

Message	Description
GGA	Detailed GPS position information (latitude, longitude, number of satellites used, age of differential corrections, etc.)
GLL	Latitude and longitude data
GSA	GPS DOP and active satellite information
GST	GNSS pseudorange error statistics and position accuracy
GSV	GNSS satellites in view
RMC	Contains recommended minimum specific GNSS data (latitude, longitude, ground speed, navigational status, etc.)

Table 1-4: Description of NMEA messages *(continued)*

Message	Description
RTCM3	Turn RTCM3 messages on or off
VTG	Course over ground and ground speed
XTE	Measured crosstrack error
ZDA	UTC time and date information

To set NMEA output:

1. Press **Menu > Settings > GPS Settings > NMEA Output**. The NMEA panel appears (shown at near right).
2. Press **Baud Rate** and select an option from the drop-down that appears (shown at far right).
3. Select a message output rate:
   a. Press the message button to display a panel for that message. The panel shows the available output rates, including an Off setting.
   b. Press the desired output rate (RTCM3 shown below). After you select the rate the panel closes and you are returned to the NMEA panel.

4. Press **GLONASS** to turn GLONASS logging on or off. This setting does not affect your reception of GLONASS signals; it only affects whether GLONASS satellites are included in log data.
5. Press **CAN3** to turn NMEA 2000 messages on or off for ISOBUS implements connected via the CAN3 bus.
6. Press **Save**.
7. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Viewing and Entering Subscription Information

The Subscriptions screen enables you to view the terminal serial number and current subscriptions/licenses, and enter a code for new subscriptions/licenses. The terminal serial number also appears on the Receiver Status screen (see “Receiver Status” on page 228).

To display the Subscriptions screen, press one of the following:

Menu > Settings > Subscriptions
Menu > Settings > GPS Settings > Subscriptions
Menu > Diagnostics > GPS > Subscriptions

When you enter a feature code you are unlocking the features of that GNSS subscription (such as GLONASS) or specific application (such as eTurns).

Note: Before you can enter a code you must first contact Outback Customer Service to obtain the code.

1. On the Subscriptions screen press **Enter Code**. The Enter Code window appears (shown at right).
2. Enter the code then press **Done**. A success message appears.
3. Press **Back**, then press Back/Close repeatedly or press the Close arrow to close the panels and return to the map.

GPS Status Information

The GPS Status screen displays GPS information you may find useful, especially if you need to troubleshoot an issue. See “GPS Status” on page 226 for information on each field of the GPS Status screen.

Receiver Status Information

The Receiver Status screen displays read-only GPS information about your Outback MAX receiver. See “Receiver Status” on page 228 for information on each field of the Receiver Status screen.

SBAS Settings

Use the SBAS Settings panel to change the SBAS satellites (or satellite PRN) used in MAX’s position calculation. The default value for each SBAS setting is Auto (Outback MAX automatically selects from the available satellites). When you select a different satellite from the default, all three SBAS buttons show "Manual" instead of "Auto." If you change any of these settings and then set any of them back to Auto, all three are automatically set back to Auto (you cannot have a mix of manual and auto settings).

Note: You can only edit/view SBAS settings if you set the Correction Type to SBAS. See “Correction Type” on page 21 for more information.

To configure SBAS settings:

1. Press **Menu > Settings > GPS Settings > SBAS Settings**. The SBAS Settings panel appears (top of panel shown at right).
2. For each SBAS button:
   a. Press the button to display a panel for that button. The panel shows the available satellites to select.
   b. Use the scroll buttons to scroll through the list of satellites then press to select the desired satellite (SBAS 1 example shown below). After you select the satellite the panel closes, the selected satellite

PRN is displayed on the button, and “Manual” appears on all three SBAS buttons.

3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

NTRIP Settings

NTRIP (Networked Transport of RTCM via Internet Protocol) is the protocol for transmitting GNSS data over the internet. Outback MAX has an internal NTRIP client that is used when receiving RTK corrections through a network RTK solution.

Receiving NTRIP RTK corrections requires that you have the optional cellular modem kit installed on your system. Contact your local dealer for more information.

After you connect to NTRIP, MAX will try to reconnect to NTRIP the next time you power on the terminal. To disable this reconnect feature, press Disconnect on the NTRIP Settings panel to disconnect NTRIP prior to powering off MAX.

Note: You can only edit/view NTRIP settings if you set the Correction Type to RTK. See “Correction Type” on page 21 for more information.

To set up NTRIP:

1. Press **Menu > Settings > GPS Settings > NTRIP Settings**. The NTRIP Settings panel appears (shown at right).

2. Set your login information.
   a. Press **Edit Login Info**. The NTRIP Login Info panel below appears.

   b. Enter values in the five white background fields (your network RTK provider should provide these values) then press **Save**. The panel closes and you are returned to the NTRIP Settings panel.
3. (Optional) Press **Auto Connect** and select On or Off.

   If you set Auto Connect to On, Outback MAX automatically attempts to connect at startup; otherwise, set to Off to manually connect.
4. Press **Connect**.
5. After a successful connection press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

To edit NTRIP login information repeat the steps above and edit the appropriate fields on the NTRIP Login Info panel.

Radio Link Settings

Use the Radio Link button on the GPS Settings panel (shown at right) to select the appropriate radio channel/frequency and mode. Refer to the documentation for your RTK kit for more information on radio channel/frequency and mode.

The Radio Link button only appears on the GPS Settings panel if you select RTK as the Correction Type (see “GPS Settings” on page 20 and “Correction Type” on page 21).

Note: Connecting NTRIP disables (dims) the Radio Link button and disconnecting NTRIP re-enables the Radio Link button—make sure you disconnect NTRIP (if connected) if you want to enter radio settings. Also, for the Radio Link button to be enabled you have to connect a radio to MAX and MAX must recognize the radio.

To set up a radio link:

1. Press **Menu > Settings > GPS Settings > Radio Link**. A radio panel appears.

   The radio in your RTK kit (and subscription for your RTK kit) determines what panel appears (top of panels shown at right).

   - If you have a 400 MHz radio kit and subscription, the panel above near right appears.
   - If you have a 900 MHz ratio kit and subscription, the panel above far right appears.

2. Set the frequency/channel.

   For the 400 MHz radio:

   a. Press **Frequency**. The Frequency panel appears (shown near right).

   b. Enter the same frequency you entered on your base station radio and press **Done**.

   For the 900 MHz radio:

   a. Press **Channel**. The Channel panel appears (shown far right).

   b. Enter the same channel you entered on your base station radio and press **Done**.

3. Select the mode. For both 400 MHz and 900 MHz radios, press **Mode** and select the desired mode from the drop-down list.

   Tip! *Outback recommends you set the Mode to Slow when communicating with an Outback BaseLineX or Outback A221 and set the Mode to Fast+R when communicating with repeaters.*

4. Press **Save**. The panel closes and you are returned to the GPS Settings panel.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

OmniSTAR Settings

Note: You must have a valid OmniSTAR subscription to use OmniSTAR corrections for guidance.

Under most conditions you will use the default OmniSTAR settings. However, if you need to edit your OmniSTAR settings use the OmniSTAR Settings panel.

To edit OmniSTAR settings:

1. Press **Menu > Settings > GPS Settings > OmniSTAR Settings**. The OmniSTAR Settings panel appears (shown at right). Manual Override is set to Off by default—when set to Off the Baud Rate and Frequency buttons are disabled.
2. Press **Manual Override** and select **On**. The Baud Rate and Frequency buttons are enabled (see below).

3. Press **Baud Rate** and select an option from the drop-down.

4. Press **Frequency**, then in the Enter Frequency window enter a value and press **Done**.

   Note: You must enter a value between 1500 and 1600 (MHz); otherwise, an error message appears after you press Save in the next step.

5. Press **Save**. The panel closes and you are returned to the GPS Settings panel.
6. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

   Note: If you edit OmniSTAR settings and then turn Manual Override to Off, Outback MAX does not retain the edited settings the next time you turn Manual Override to On.

Outback MAX also provides OmniSTAR status information via the OmniSTAR Status screen. See“OmniSTAR Status” on page 232 for information on each field of this screen.

Map Settings

You enter Map settings (such as setting grid spacing and importing map imagery) via the Map Settings panel (shown at right).

To display the Map Settings panel, press **Menu > Settings > Map Settings**.

Refer to the following sections for more information:

- “Straight Path Options” on page 131 for A=B Lines and A=B grid spacing
- “Editing a Preset Marker” on page 122 for editing preset markers
- “Map Imagery” on page 125 for map imagery
- Chapter 6, “Maps”for all other mapping options and tasks

Rate Control Settings

Rate control settings apply to the optional rate control hardware that you can install and then operate via Outback MAX. See “Configuring Your Implement for Rate Control” on page 174 for information on entering rate control settings and “Rate Control” on page 174 for general rate control information.

Lightbar Settings

Outback MAX includes an onscreen lightbar and supports an (optional) external lightbar. See “Outback MAX Touchscreen” on page 5 and “Using the External Lightbar” on page 214 for more information on the lightbars.

You can edit the following lightbar settings:

- Lightbar on/off (external lightbar only)
- Sensitivity (onscreen lightbar and external lightbar)
- Brightness (external lightbar only)

To edit lightbar settings:

1. Press **Menu > Settings > Lightbar Settings**. The Lightbar Settings panel appears (shown at right).
2. Press **Lightbar** then press **On** or **Off** from the drop-down (this applies only to an externally connected lightbar). The selected setting appears on the Lightbar button.
3. Press **Sensitivity** and select **Low**, **Medium**, or **High** from the drop-down. The selected setting appears on the Sensitivity button.

4. Press **Lightbar Brightness** to display the Lightbar Brightness slider.

   Drag the slider or press the left or right arrows to set the brightness level and then press **Close**. The selected setting appears on the Lightbar Brightness button.
5. Press **Save**.
6. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Switchbox Settings

This setting controls the brightness of the LEDs on the optional external switchbox. See “Using the Switchbox” on page 215 for information on the switchbox.

To edit the switchbox brightness:

1. Press **Menu > Settings > Switchbox Settings**. The Switchbox Settings panel appears (top of panel shown at right).
2. Press **Switchbox Brightness**. The Switchbox Brightness slider appears.
3. Drag the slider or press the left and right arrows to set the brightness level.
4. Press **Close**. The selected setting appears on the Switchbox Brightness button.
5. Press **Save**.
6. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Networking

Use the Networking panel (shown at right) to configure your wireless networks on Outback MAX.

From this panel you can:

- Set up a Wi-Fi hotspot
- Connect to a network
- Delete saved access points

Setting Up a Wi-Fi Hotspot

To use the cellular data connection of a mobile device (such as a cell phone) to connect Outback MAX to the Internet (referred to as setting up a Wi-Fi hotspot), you must enable this feature on your mobile device.

Note: Using your mobile device as a Wi-Fi hotspot may incur charges from your cellular carrier. Contact your carrier for more information.

The following example illustrates how to set up an iPhone 4s as a Personal Hotspot. Follow a similar procedure for your device.

1. On your iPhone main screen (at right) press **Settings**. The Settings page appears (top of page shown below).

2. Verify your cellular connection is on (if off, “Off” appears next to “Cellular”).

3. If Personal Hotspot is set to Off, press **Personal Hotspot**. The Personal Hotspot page appears.

4. Press the **Personal Hotspot** button. The button slides to the right and the area to the left of the button is green.

5. Use your iPhone Wi-Fi Password (circled above) as the wireless network password in "Connecting to a Network" below.

Connecting to a Network

Outback MAX includes networking functionality that allows you to connect to a wireless network (Wi-Fi), similar to connecting a PC to a wireless network at home.

Before you set up and use networking:

- If your MAX terminal includes a wireless USB adapter upon purchase of an Outback MAX system, the adapter should already be inserted in a USB port on the terminal.
- Verify the adapter is in place. When you first turn on your system you can view existing available wireless networks.

If you want to use the networking feature on an existing terminal, insert your adapter into a USB port on the terminal when the terminal is off. If you insert the adapter when the terminal is on, you must reboot the terminal (power it off then on) for the adapter to see existing available wireless networks.

To use the cellular data connection of a mobile device (such as a cell phone) to connect MAX to the Internet (referred to as setting up a Wi-Fi hotspot), you must enable this feature on your mobile device. See “Setting Up a Wi-Fi Hotspot” (previous section).

Note: Using your mobile device as a Wi-Fi hotspot may incur charges from your cellular carrier. Contact your carrier for more information.

To connect to a network:

1. Press **Menu > Settings > Networking**. The Networking panel appears (top of panel shown at right).

   Note: Each time you reboot Outback MAX the Connection State is Disconnected.

2. Press **Select Network**. The Wireless Access Points panel appears (at right) showing a list of available access points.
3. Select an access point from the list. If the access point requires a password the Enter Text window appears.

4. Enter the access point password then press **Done**. The Enter Text window closes, the Connection State briefly displays "Connecting" (below left), and if the connection is successful the Connection State displays "Internet" (below right).

Deleting Saved Access Points

A Wi-Fi hotspot using a cellular data connection shows up in Outback MAX as a wireless network. When connecting to a network you enter a password for this connection—in MAX this saved password is referred to as a saved access point.

To delete saved access points:

1. Press **Menu > Settings > Networking**. The Networking panel appears (top of panel shown at right).
2. Press **Delete Saved Access Points**.

ConnX Settings

Use Outback ConnX to track assets, push prescription maps from a website to Outback MAX (using that map during a job), and export jobs back to ConnX or to a PC in an office. If you have a ConnX account you can enter your user information on the ConnX Settings panel (see top right of next page).

The following procedures show how to:

- Set up ConnX
- Clear cached files (prescription maps) from the MAX terminal
- Sync with ConnX
- Delete information from the MAX terminal

To display the ConnX panel, press **Menu > Settings > ConnX Settings**.

Setting Up ConnX

1. Press **Menu > Settings > ConnX Settings**. The ConnX Settings panel appears (shown at right).
2. Enter your ConnX user ID and password:
   a. Press the **UserID** field, enter your ID in the Enter UserID window, then press **Done**.
   b. Press the **Password** field, enter your password in the Enter Password window, then press **Done**.

Note: In both the Enter UserID window (shown below) and the Enter Password window, you can press the Alt key to display additional characters (such as "@" and "#").

3. Select the appropriate system from the System drop-down.
4. Select **On** or **Off** from the Position Tracking drop-down.
5. Press **Back**.
6. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Clearing Cached Files (Rx Maps)

Clearing cached files deletes the files from the MAX terminal.

1. Press **Menu > Settings > ConnX Settings**. The ConnX Settings panel appears (see top right of this page). The Cached files field shows the number of Rx maps on your terminal—each Rx map is actually made up of three files, so if the Cached files field displays 6, your terminal has two Rx maps.
2. Press **Clear Cache**.

Syncing with ConnX

Syncing with your ConnX account allows you to download/upload all clients, farms, fields, boundaries, waylines, markers, and product profiles for your ConnX account so your ConnX account and Outback MAX have the same full set of files. The process consists of sending added/deleted/changed records from the MAX terminal to ConnX and then ConnX sends added/deleted/changed records back to the MAX terminal.

Syncing is not available (is disabled) while you have an active job. You must close the active job to be able to sync with ConnX.

1. Verify there is no active job.
2. Press **Menu > Settings > ConnX Settings**. The ConnX Settings panel appears (shown at right).
3. Press **Sync**. The following progress message appears.

4. When the progress message closes the syncing is complete. Press **Back**.
5. Press **Back/Close** repeatedly or press the Close arrows to close the panels and return to the map.

Deleting Database Files

Deleting the database deletes clients, farms, fields, boundaries, markers, waylines, and products from the MAX terminal, but not from your ConnX account.

1. Press **Menu > Settings > ConnX Settings**. The ConnX Settings panel appears (see above right).
2. Press **Delete Database**. The following confirmation message appears.
3. Press **Yes**.

Corporate Farm

Corporate Farm is an optional feature that allows you to provide limited access to all but administrator accounts. For example, you may want users to be able to add a vehicle but not add a product. See “Using Corporate Farm” on page 221 for more information.

eTurns Setup

Pressing the eTurns Setup button displays the eTurns Setup panel, where you configure your eTurns. See “Configuring and Making eTurns” on page 158 for more information.

ISOBUS Settings

Use the ISO Settings panel (shown at right) to:

- Adjust VT (virtual terminal) settings
- Map physical inputs to functions on ISOBUS ECUs
- Clear unneeded object pools (ISOBUS implement ECU data) to speed up ECU-to-VT performance
- View VT diagnostic information to troubleshoot an issue (see “ISO VT Diagnostics” on page 256)

To display the ISO Settings panel, press **Menu > Settings > ISOBUS Settings**.

VT (Virtual Terminal) Settings

Use the VT Settings panel (at right) in conjunction with the table below to adjust VT settings or restart the VT window.

To display the VT Settings panel, press **Menu > Settings > ISOBUS Settings > VT Settings**.

To adjust a setting (green button), press the appropriate button then select an item from the drop-down.

Button	Description
VT Version	Version of ISO VT standard supported by Outback MAX
VT Number	If your vehicle uses multiple virtual terminals (VTs) on the CAN bus, you can specify which number is associated with Outback MAX.
Date Format Time Format Decimal Format	If your ISOBUS supports this feature, use these buttons to select a preferred format for VT window data.
VT Turn/Push	When set to On, changes the functionality of the Outback MAX terminal buttons (hard keys), where: • Up/Down buttons act as up/down navigation buttons in the ISOVT window • Favorites button acts as an Enter key in the ISOVT window See “Terminal Buttons” on page 4 for more information.
Fullscreen Alarms	When set to On, alarm messages display full screen.
Preview	Set to On to have the ISOVT window display as a smaller window (does not appear full screen); set to Off to have the ISOVT window display full screen.
Restart	Use this feature only when directed by Outback Guidance Customer Service. Press to close then reopen the VT window.

Mapping Auxiliary Inputs

Outback MAX enables you to map physical inputs to functions on ISOBUS ECUs (for example, mapping a button on a joystick to raising part of an implement).

To map physical inputs to functions on ISOBUS ECUs:

1. Press **Menu > Settings > ISOBUS Settings**. The ISO Settings panel appears (top section of panel shown at right).
2. Press **Aux Input Settings**. The screen below appears.

3. Follow the onscreen instructions to map your inputs, using the following buttons if necessary:
   - **Learn** - press to activate an onscreen wizard to walk you through the input mapping process
   - **Reset & Refresh** - press to reset auxiliary inputs
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Clearing Object Pools

An object pool is the screen data transmitted from the ISOBUS implement (ECU) to the Outback MAX terminal. When an ECU uploads an object pool to the terminal, MAX saves the object pool so the implement ECU does not have to transmit this same data each time you turn on the system. If you experience data or system issues between the implement ECU and the terminal, you can clear all object pools and reboot the system (this would cause the implement ECU to perform a fresh upload of data to the terminal).

To clear object pools:

1. Press **Menu > Settings > ISOBUS Settings**. The ISO Settings panel appears (top of panel at right).

2. Press **Clear Object Pools**. The Clear Object Pools panel appears (shown at right).
3. Use the up/down scroll buttons to scroll through the list of object pools (if necessary) then press to select the object pools you want to delete. If you want to delete all object pools press **Select All**.
4. Press **Delete**. A message appears asking if you are sure you want to clear the selected object pools.

5. Press **Yes**.
6. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

eDriveX Settings

Use the eDriveX Settings panel (shown at right) to adjust the following eDriveX settings.

- 2D or 3D projection
- Pre-engage
- Steering smoothing

To display the eDriveX Settings panel, press **Menu > Settings > eDriveX Settings**.

Setting 2D or 3D Projection

The A=B projection mode relates to the effect of the earth's curvature on guidance accuracy. Select 3D as the A=B projection mode for wide field operations or interoperability with third party guidance systems that also use 3D guidance line projection.

Note: 3D A=B projection is unrelated to the 3D map view or the 3D GPS position type.

To set 2D or 3D projection:

1. Press **Menu > Settings > eDriveX Settings**. The eDriveX Settings panel appears (top of panel shown at right) and the Projection button displays the current setting.
2. Press **Projection** the press **2D** and **3D**.

3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Pre-Engage

Note: Pre-engage is only available on Outback MAX systems fitted with Outback eDriveX.

Pre-engage enables you to activate the Steering button before all engage requirements are met. Once the requirements are met, MAX automatically engages on a guideline.

Pre-engage is a two-step process:

1. Enable pre-engage feature (make it available)—steps 1-4 below.
2. Activate pre-engage—step 5 below.

To use pre-engage:

1. Press **Menu > Settings > eDriveX Settings**. The eDriveX Settings panel appears (top of panel shown at right) and the Pre-Engage button displays the current setting.

2. Press **Pre-Engage**. A drop-down appears showing the options: On and Off.

3. Press **On**. The new setting (On) appears on the Pre-Engage button.
   - If you are not ready for autosteering, a ‘P’ appears on the Steering button (shown below).
   - If you are ready for autosteering, the Steering button appears as normal.

Steering button displays a ‘P’ when Pre-Engage is set to On

Note: To turn pre-engage off, repeat steps 1 - 3 and press Off.

4. Press **Back/Close** repeatedly or press the Close arrows to close the panels and return to the map.
5. Press the Steering button to activate pre-engage. The 'P' no longer appears on the Steering button and the Steering button flashes a green background.

Steering button flashes green background

As soon as all the engage requirements are met MAX automatically engages on a guideline.

Setting Steering Smoothing

Steering smoothing determines the amount of smoothing of contours. The smoothing applied to the current contour is based on the smoothing setting that was active during the preceding pass.

Depending on preference and needs, smoothing can be adjusted to None (default), Low, Medium, or High. For example, it might be necessary to adjust the smoothing setting if a vehicle/implement combination does not allow turning within a tight radius. In addition, a very sharp curvature might not be desired during high-speed operation.

Performance for the steering smoothing settings are as follows:

- Off (default) - System tries to follow every contour, even if the contour has a very tight curvature, but may disengage when following a very tight turn.
- Low - System applies minimum smoothing.
- Medium - System applies medium smoothing.
- High - System generates optimized control paths for high-speed operation, where the minimum curvature for each turn is large. It is not suitable for tight-turn operations as unwanted coverage gaps may occur.

MAX has a minimum radius for each setting and cannot generate the correct path if the curve diameter is less than twice that minimum radius. The minimum radius for each smoothing setting is:

- Off = 5 m
- Low = 10 m
- Medium = 15 m
- High = 20 m

To set steering smoothing:

1. Press **Menu > Settings > eDriveX Settings**. The eDriveX Settings panel appears (top of panel shown at right) and the Smoothing button displays the current setting.

2. Press **Smoothing** then press the desired setting (Off, Low, Medium, or High).

3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

ISO VT

ISOBUS is a standard communication interface and graphic display for tractors, implements (such as a boom height controller), and farming systems that enables equipment from different manufacturers to communicate with each other.

A Virtual Terminal or VT allows an operator to interact with ECUs on the network through user inputs. Similar to a Web browser, the VT is for visualization only and does no processing. If your tractor supports ISOBUS it will have an ISOBUS port—typically located on the right hand side of the cab of the vehicle (two examples shown at right).

To connect an ISOBUS-enabled implement, plug the implement cable ISOBUS connector into the ISOBUS port on the tractor.

Some farming systems use a separate ISOBUS terminal to communicate with ISOBUS-enabled implements. With MAX, the ISOBUS terminal is displayed on the MAX terminal in the form of a separate window (or virtual terminal) as shown at right. So in MAX the ISOBUS virtual terminal is known as ISO VT (the ISOVT button is in the lower left of the MAX terminal screen).

When you connect an ISOBUS-enabled implement to MAX the application for the implement appears along the left side of the ISO VT window (UC5 shown below left). Press the application button to display options for that application along the right side of the ISO VT window (shown below right).

You can resize the window to take up less screen size and move the window around the screen.

Working with the ISO VT Window

To display the ISO VT window, press the **ISOVT** button in the lower left of the screen.

To resize the ISO VT window, press the Resize button in the upper left of the ISO VT window to make the window smaller (below left). To return to the default large size window, press anywhere within the small window (below right).

To move (reposition) the smaller ISO VT window on the screen, place your finger anywhere within the ISO VT window and drag the window to the desired location

To close the ISO VT window, press the **ISOVT** button.

Troubleshooting

If an ISO VT-related error occurs a yellow triangle appears to the right of the ISOVT button (shown at right).

Press the yellow triangle button to display the Error Warning Log window.

Errors/warnings appear starting at the top of the screen. The two buttons at the bottom of the screen provide the following functionality:

- **Dismiss All** closes all errors and returns you to the map screen. The yellow triangle button to the right of the ISOVT button no longer appears (because you dismissed all errors).
- **Hide** closes the Error/Warning Log screen and returns you to the map screen; however, the yellow triangle button is still visible and the errors/warnings remain.

For information on ISO VT settings and diagnostics see “ISOBUS Settings” on page 37 and “ISO VT Diagnostics” on page 256.

Backing Up and Restoring Data

In any computer or machine environment it is good practice to back up your data. Security and the ability to restore previous terminal data are the two main reasons.

Via buttons on the Terminal Diagnostics screen, MAX enables you to back up data to a USB drive as well as restore the data on the terminal from the USB drive.

When you perform a backup, MAX saves the data as a single file with a .tar file extension. For example, if you backed up your terminal data on July 10, 2013 the tar file is: *Max_Backup_07102013.tar*

To back up data to a USB drive:

1. Insert a USB drive into the terminal.
2. Press **Menu > Diagnostics > Terminal Diagnostics**. The Terminal Diagnostics screen appears.
3. Press **Backup Data**. MAX briefly displays backup messages in the Last Backup field, creates a folder named “MAX_Backups” on the USB drive, and backs up the data to this folder. When the backup is complete:
   - A Backup Complete message appears. Press **Ok** to close the message.
   - The Last Backup field shows the date of the backup.

To restore data from a USB drive to the MAX terminal:

1. Insert the USB drive containing your backed up data ("MAX_Backups" folder) into the terminal.
2. Press **Menu > Diagnostics > Terminal Diagnostics**. The Terminal Diagnostics screen appears.

3. Press **Restore Data**. The Terminal Diagnostics screen closes and the Restore Data panel appears (shown at right).
4. Use the up/down scroll buttons to scroll through the list of data files (if necessary) then press to select the data file you want to restore. The following occur:
   - The Restore Data panel closes.
   - The Terminal Diagnostics screen appears.
   - A progress indicator (circle) briefly appears.

   - The Last Backup field shows the date of the restored file.
   - A REBOOT message appears. Press Ok to close the message.

Help Messages

While using MAX a Help message may appear—usually this occurs when an action cannot be performed, such as when pressing an inactive/dimmed button. If a Help message appears, press **Ok** to close the message. Below are two examples of Help messages that may appear while operating MAX.

Path Planning button pressed: No active job

Path Adjustment button pressed: Not in A=B (Straight), pivot, or AB Contour guidance mode

Chapter 2: Autosteering

Performing a Steering Test

Antenna Pivot

Antenna Offset

Vehicle Calibration Considerations

Steering Options

This chapter applies only if you have automated steering (such as eDriveXC) installed and connected to your MAX system. Before you add a vehicle, review the information in this chapter. The following bullets provide a summary of the required steps to properly set up automated steering.

- Performing a steering test
- Antenna pivot
- Antenna offset
- Vehicle calibration
- Steering options

Performing a Steering Test

Perform a steering test to check the connectivity of the system. Test the steering with:

- Vehicle moving at no more than 4 kph (2.5 mph)
- eDriveX power switch in the 'AUTO' position

To perform a steering test with eDriveX connected:

1. Press **Menu > Diagnostics > eDriveX > Steer Test**. The eDriveX Steer Test screen appears.

If ESi is installed but not ready additional warning text appears (shown below).

2. Review the Warning at the top of the screen.

3. Start driving your vehicle, maintaining your speed between 0.0 and 4 kph (0.0 and 2.5 mph). The speed bar shows green if your speed is within limits or red if you are going too fast—see examples below.
   - Green up to the vertical line in the bar if you drive up to 4.0 kph—keep the speed bar in the green when driving during this test

   - Red and moves beyond the vertical line in the bar if you drive above 4.0 kph

4. Press the left arrow and verify the vehicle steers to the left. Press the stop button (square middle button) as soon as the direction is confirmed.
5. Press the right arrow and verify the vehicle steers to the right. Press the stop button as soon as the direction is confirmed.

If the system passed the steering test, continue with the next section (“Antenna Pivot”). If the system did not pass the steering test see the table below and re-check your installation.

Problem	Solution
Wheels move in wrong direction (left instead of right or right instead of left)	Swap the two cables connected to the solenoids of the eDriveX hydraulic block
Wheels do not move	Check for problems with each of the following system components: • Hydraulics • Wheel angle sensor • Electronics • eDriveX harness

If, after troubleshooting, you still cannot perform a successful steering test, contact your local dealer or Outback Guidance Customer Service.

Antenna Pivot

Antenna pivot is the perpendicular distance of the antenna's center in front of or behind the vehicle's pivot point. The vehicle's pivot point depends on the vehicle type, such as a standard tractor or sprayer (see Select Vehicle Type panel at right).

Note: Measure the antenna pivot as accurately as practical, as this measurement has some impact on the accuracy of vehicle guidance and is also the reference point from which the implement offset is calculated. Unlike the antenna left/right offset, there is really no field method to verify or improve the antenna pivot measurement.

The first figure below shows the Vehicle Dimensions screen for a standard tractor. The figures that follow show how the dimensions for each vehicle type are measured.

Standard tractor

Articulated tractor

Sprayer

Combine

Tracked tractor

Spreader

Swather

Antenna Offset

Antenna offset is the lateral (perpendicular) distance between the center of the GPS antenna and the centerline of the vehicle. To achieve optimum steering accuracy you must determine the antenna offset in the field. However, you need to have completed the calibration procedure before you can conduct the field tests, and to complete vehicle calibration, you need to enter the antenna offset values on the Vehicle Dimensions screen. Because you do not have an accurate antenna offset when working through calibration, you have two options:

- Leave the antenna offset as 0.00 and enter the measured offset later
- Enter an estimated ‘provisional’ offset value (suggested if you have a noticeable antenna offset that you can measure or estimate)

When you have completed the vehicle calibration and determined the actual antenna offset, you can revisit vehicle calibration and add the actual value; however, see “Completing Vehicle Calibration Steps in Sequence” on page 60 and “Changing a Completed Calibration Step” on page 61 for important information on changing calibration values.

To enter a provisional antenna offset:

1. Measure the perpendicular distance of the center of the antenna from the centerline of the vehicle.
2. Enter the value as the antenna offset on the Vehicle Dimensions screen.

   See step 6 of “Adding a Vehicle” on page 67 for setting the antenna pivot.

The following text provides general information on antenna offsets and “Determining Antenna Offset Overview” on page 55 describes two methods for determining the antenna offset.

Figure 2-1: Antenna offset (distance= X, direction = right)

When ‘calibrating an antenna offset’ you are actually compensating for a physical antenna offset. To compensate for a physical antenna offset:

- Measure the effect of the uncompensated antenna offset
- Calculate the offset adjustment required
- Enter the calculated adjustment to compensate for the physical antenna offset

An offset—for which you will compensate—comprises a measured distance (the amount of the offset) and a direction (left or right of vehicle centerline). In Figure 2-1, the offset distance (or amount) is X, the direction is right.

Because it is difficult to measure the antenna offset on the vehicle, you must determine the antenna offset in the field to ensure maximum steering accuracy. However, you need to have completed the calibration before you can conduct the field tests, and to complete vehicle calibration, you need to enter the antenna offset. This initial—or provisional—setting enables you to complete vehicle calibration so you can conduct the field test for an exact antenna offset.

Note: If the center of your antenna is exactly on the centerline of the vehicle, you have no antenna offset and no compensation is required. When you carry out the procedures for determining the offset, the result will be a measured offset of zero and no further action will be required.

WARNING: *Calibration is required if the system shows an offset while driving up and down on a guidance line without an implement after calibrating the roll bias.*

Determining Antenna Offset Overview

There are two ways to determine the antenna offset:

- **Track** method (preferred): This method measures the track difference, in at least three places, during two passes (one in each direction) on the same A=B line. The method requires a surface where the vehicle clearly leaves tracks.

  Note: 'Track' in this context means wheel or track marks on the ground. The track method for determining antenna offset is suitable for wheel and track vehicles.

- **Marker** method: This method measures the offset using at least three flags (or other markers) to mark the center of the vehicle (hitch pin point) during two runs (one in each direction) on the same A=B line. If using the marker method, use at least three measurement points on the A=B line.

Whichever method you use, the antenna offset (the physical offset on the vehicle and the compensating offset value you enter in the system) is half the measured difference in the track of the vehicle over the two runs.

Determining Antenna Offset - Track Method

Figure 2-2: Determining antenna offset (example 6/2 = 3 cm left)

To determine the antenna offset (track method):

1. Set up a straight A=B line (see "Setting an A=B Line" on page 133).
2. Maintaining a speed of 5 kph (3 mph) engage steering and let the system steer you along the guideline for at least 100 m. See Pass 1 in Figure 2-2.
3. Perform a keyhole turn, re-engage the steering, and let the system steer you down the same guideline. See Pass 2 in Figure 2-2.
4. In three different places along the A=B line, measure the distance between the corresponding track marks (inside edges, outside edges or centers, whichever are easiest to see and measure, see Figure 2-2). If there is variation, calculate

the average difference. In Figure 2-2 the track difference is 6 cm, measured at the outside edges of the track marks at one point on the A=B line.

Note: Take your measurements where the vehicle was travelling with a crosstrack of between 0-1, that is, not just after re-acquiring the A=B line after your turn (sometimes referred to as 'allowing settling time').

Halve the measurement (3 cm). This is the amount of the physical antenna offset—the offset you need to compensate for and need to enter as the antenna offset (in meters, 0.03 m) at step 7.

5. Determine the direction of the offset—this is the left or right direction of the antenna's centerline relative to the vehicle centerline when viewed in the direction of travel.
6. Press **Menu > Vehicle Profiles > Current Vehicle > Vehicle Dimensions**. The Vehicle Dimensions screen appears.

7. Press the **Antenna L/R Offset** field (white box). 'Enter Antenna L/R Offset' appears above the keypad and Left and Right buttons appear below the keypad (shown at right).

   Enter an offset value using the keypad, press **Left** or **Right**, then press **Done** to confirm the value and close the screen.

8. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

9. Test the completed calibration by letting the system control up and down on a new A=B line—the tracks should match. If they do not match, repeat the procedure for determining the antenna offset.

Determining Antenna Offset - Marker Method

Figure 2-3: Determining the antenna offset (example 6/2 = 3 cm left)

To determine the antenna offset (marker method):

1. Set up a straight A=B line (see “Setting an A=B Line” on page 133).
2. Maintaining a speed of 5 kph (3 mph) engage steering and let the system steer you along the guideline for at least 100 m. When the crosstrack has stabilized (0-1), place at least three markers along the A=B line and on the centerline of the vehicle (the hitch pin point). See Pass 1 in Figure 2-3.
3. Perform a keyhole turn, re-engage the steering, and let the system steer you down the same guideline. When the crosstrack has stabilized (0-1), place more

markers close to those placed on the first pass. See Pass 2 in Figure 2-3.

Note: Place your markers while the vehicle is travelling with a crosstrack of between 0-1, that is, not just after re-acquiring the A=B line after your turn (sometimes referred to as 'allowing settling time').

4. Measure the distance between corresponding markers. In Figure 2-3 the centerline difference is 6 cm.

   Halve the measurement (3 cm). This is the amount of the physical offset of the antenna—the offset you need to compensate for and need to enter as the antenna offset (in meters, 0.03 m).

5. Determine the direction of the offset—this is the left or right direction of the antenna's centerline relative to the vehicle centerline when viewed in the direction of travel.
6. Complete steps 6 through 8 of "Determining Antenna Offset - Track Method" on page 55.
7. Test the completed calibration by letting the system control up and down on a new A=B line and placing markers as before. The centerlines should match. If they do not match, repeat the procedure for determining the antenna offset.

Vehicle Calibration Considerations

Outback MAX guides you through the vehicle calibration process using step-by-step instructions. With eDriveX installed and powered up, a successful steering test completed, and the prerequisites met (see the next section, “Before Calibrating a Vehicle”)you are ready to calibrate a vehicle.

Before Calibrating a Vehicle

Before calibrating a vehicle ensure that:

- GPS antenna/sensor is located in its final position and initialized.
- You use the GPS source the vehicle will use in operations. For example, if you plan to use RTK in the field you must use RTK during calibration.
- All the items at the top of the eDriveX Status screen are green (see Table A-7 under “eDriveX Status” on page 241).
- eDriveX power switch is in the ‘AUTO’ position.

Calibration Steps and Vehicle/Valve Types

The calibration steps you complete are based on the vehicle/valve type combination you select when adding a new vehicle.

See the following topics for more information:

- “Antenna Pivot” on page 52 for the vehicle types you can select in MAX
- “Adding a Vehicle” on page 67 for information on selecting a vehicle type and valve type

After selecting a vehicle/valve type combination and entering your vehicle's dimensions, you calibrate your vehicle. The buttons (required steps) on the Vehicle Calibration panel depend on the vehicle/valve type combination you selected, as shown in the examples below.

Vehicle: Standard Tractor
Valve: AJX STD FLOW

Vehicle: Standard Tractor
Valve: Versatile

Vehicle: Standard Tractor
Valve: ESi

Completing Vehicle Calibration Steps in Sequence

Because you must complete the calibration steps in sequence, some step buttons are inactive (dimmed) until you can perform that step.

For example you must complete the "ECU Orientation" step (active button at right) before completing any other steps (inactive buttons at right).

Changing a Completed Calibration Step

If you need to change a step you have already completed, you must re-do all the subsequent steps that were also completed.

For example, you have completed all the calibration steps for a wheeled hydraulic steering vehicle. You then need to change the eDriveX ECU orientation (first step). After you make this change only the next step (Coarse WAS) is available for you to change (all other steps are inactive).

Note: This behavior is only until you have completed all the calibration steps applicable to your vehicle. Once you have completed the roll and pitch bias calibration, you can make changes at other steps without having to revisit the subsequent steps.

About Engine Speed During Calibration

Some calibration steps should be carried out at full hydraulic pressure. Because some hydraulic systems need higher engine speeds than others to achieve full hydraulic pressure, it is recommend that you execute those calibration steps with a minimum engine speed of 1500 rev/min. This is indicated as a requirement where it applies.

Converging Filters

Filters are an important part of the data processing that enables precision guidance and autosteering. To be effective, filters need to be converged. Filters may be either converged (for immediate use) or converged with convergence data stored (for immediate and subsequent reuse). Certain driving routines will result in convergence but you need to meet more conditions for convergence data to be stored.

A check mark next to 'Filters Converged' in the Run Time Status section of the eDriveX Status screen indicates filters have been converged; however, it does not indicate that the convergence data is stored (although it may be - see “Filter Self-Convergence” on page 62).

Note - vehicle/valve combination: Convergence data, if stored, is stored for each vehicle/valve type combination. If you change the vehicle/valve type combination to a combination for which there is no stored convergence data, you will need to repeat the appropriate convergence and convergence data storage requirements.

Initial Convergence or Re-convergence

Initial filter convergence (and re-convergence if required) is achieved through a driving pattern. The driving sequences executed manually or automatically during the calibration process are normally enough for filters to converge. If the calibration driving sequences are enough, the convergence status will show as checked. You will then have to meet the requirements for convergence data storage (see “Manual Driving Sequence” on the next page).

If the driving sequences within the calibration process do not result in filter convergence, or a full calibration is not required, execute the ‘manual’ sequence

described in the next section (see also the additional storage driving requirements in the same section and “Re-Converging Filters” on page 63).

Note - antenna position: Filter convergence includes a calculation of the antenna position. If there is a difference of more than 1 m between the calculated antenna position and the entered antenna fore/aft (‘pivot’) dimension, the filters will converge but the filter data will not be stored. To avoid this situation, ensure you have accurately entered the antenna pivot dimension when adding a new vehicle (see “Antenna Pivot” on page 52 and “Adding a Vehicle” on page 67).

Manual Driving Sequence

The following procedure describes how to manually converge filters. You will need to perform this procedure if the Filters Converged status indicator is a red exclamation point (at right).

Note: Pressing the Help button to the left of the indicator provides instructions on how to resolve the issue.

Using the figure at right as a guide and driving the vehicle at a slow speed (typically 5-7 kph), complete the following steps to manually converge filters:

1. Drive straight for 10 m. If filters do not converge, go to step 2.
2. Drive a tight full circle to the left.
3. Drive a tight full circle to the right. If filters do not converge, go to step 4.
4. Drive straight for 10 m.

To store the newly acquired convergence data you must drive at least three minutes (recommended minimum) under autosteering and bring the vehicle to a stop (the point at which the data is stored). This can be cumulative—you do not have to immediately drive under autosteer for three minutes and stop. Provided you have three minutes of autosteering (for which filters must be converged) and come to a halt before you power off eDriveX, the convergence data will be stored (but see *Note* on antenna position at top of this page).

Filter Self-Convergence

On system startup, the filters converged status always indicates filters are not converged: this is normal. After you drive forward for at least ten seconds, the status should become checked indicating the use of stored convergence data. If the status does not change, it indicates convergence data is not stored. Refer to “Re-Converging Filters” on the next page.

Re-Converging Filters

Filters will need to be re-converged—and the new convergence data stored—if:

- Filter convergence data was never stored.
- Antenna calibrated (entered) dimension is changed by more than 0.1 m.
- Vehicle/valve type combination is changed to one that has not been used before (meaning there is no convergence data for the combination - see *Note: vehicle/valve combination*, page 61).

If re-convergence is required, establish the reason and, accordingly, reset the antenna data, complete the calibration process, and/or complete the driving requirements for convergence and convergence data storage.

Steering Options

Steering adjustment options include:

- Sensitivity—how aggressively the vehicle steers on the guidance line when in close proximity
- Attack—how aggressively the vehicle steers onto the guidance line when approaching it from a distance
- Smoothing—amount of smoothing of contours

The sections that follow describe steering sensitivity and steering attack. For information on steering smoothing see “Setting Steering Smoothing” on page 42.

Steering Sensitivity

Note: See “Adding a Vehicle” on page 67 to set steering sensitivity.

Steering sensitivity determines how aggressively the vehicle steers onto the guidance line when approaching it from close proximity. Depending on preference and needs, you can adjust sensitivity to between 0 and 20. The default setting 7 is a good value to start with on most vehicles. Use Table 2-1 as a guide to setting the sensitivity.

Table 2-1: Sensitivity settings

Setting	Performance
Low value	Smooth steering adjustments, eventual lack of crosstrack accuracy (in this sense, crosstrack is the real-time, constantly changing horizontal offset of the vehicle to the desired position on the guidance line).
Medium value	Good compromise between smooth steering and crosstrack accuracy.
High value	Aggressive steering adjustments with the wheels being very active (or twitchy). Highest cross track accuracy.

Adjust the sensitivity setting during vehicle calibration to maintain the GPS guideline accurately without rapidly overshooting or responding too slowly.

- If steering corrections are too rapid, causing the machine to jerk erratically back and forth across the line, sensitivity is set is too high (below left).
- If the machine slowly weaves down the guideline, sensitivity is set is too low (below right).

The best sensitivity setting for optimized machine control will depend on such parameters as vehicle type, implement, working speed, and field conditions.

Steering Attack

Note: See "Adding a Vehicle" on page 67 to set steering attack.

Steering attack determines how aggressively the vehicle steers onto the guidance line when approaching it from a distance. Depending on preference and needs, you can set attack to between 1 and 10. The default setting 10 (maximum) is a good value to start with on most vehicles. Use Table 2-2 as a guide to setting the attack.

Table 2-2: Attack settings

Setting	Performance
Low value	Very slow line acquisition (the vehicle will not overshoot the guidance line during approach).
Medium value	Good compromise between fast line acquisition and some overshoot.
High value	Fast line acquisition with the potential to overshoot the guidance line until the system catches up.

Chapter 3: Working with Vehicles and Implements

Working with Vehicles

Working with Implements

Working with Vehicles

A vehicle in MAX refers to a machine you drive in the field, such as a sprayer, planter, or tractor. You can add as many vehicles to MAX as you want and select the one you need for your job. The first time you power up MAX there are no vehicles—after adding a vehicle (or vehicles), upon powerup MAX loads the vehicle that was loaded prior to the terminal being powered down.

The map screen always displays a vehicle as shown at right (you can change the color), whether it is the default vehicle or a vehicle that you add.

You use the Vehicle Profiles panel (shown at right) as the starting point for performing the following vehicle tasks:

- Adding a vehicle
- Editing a vehicle
- Loading a previous (existing) vehicle
- Importing a vehicle
- Exporting a vehicle
- Deleting a vehicle

Adding a Vehicle

When you add a vehicle it remains in memory, even if you move the terminal to another vehicle. For example, if you add a vehicle, move the terminal to another vehicle for use, and reinstall the terminal in the original vehicle, your original vehicle in MAX will still be there.

You must add a vehicle and an implement before you can begin a job.

To add a vehicle:

1. Press **Menu > Vehicle Profiles > New Vehicle**. The New Vehicle Profile panel appears—only the Vehicle Name and Vehicle Color fields are available.

   As you enter field values more buttons become available. For example, after you enter the Vehicle Name the Vehicle Type button becomes available.

2. Enter the vehicle name: Press **Vehicle Name**, enter a name in the Enter Vehicle Name window (shown below), then press **Done**. The new vehicle name appears on the Vehicle Name button.

   Tip! *Use names you will recognize if adding many vehicles.*

3. Select the vehicle color: Press **Vehicle Color** then press a color in the Select Color window (shown below). The new color appears on the Vehicle Color button and on the vehicle on the map screen.

4. Select a vehicle type: Press **Vehicle Type** then press a vehicle button on the Select Vehicle Type panel (top of panel shown at right). The vehicle type appears on the Vehicle Type button.

5. Select a valve type: Press **Valve Type** then press a valve button on the Valve Type panel (shown at right). The valve type appears on the Valve Type button of the New Vehicle Profile panel.

*Note: You can change vehicle type and/or valve type. After a change of either, a system message prompts you to restart the ECU for the changes to take effect. Press **OK** to acknowledge the message and continue - you will restart the ECU after changing the valve type. See also "Changing a Completed Calibration Step" on page 61.*

Also, only valve types valid for the currently selected vehicle type are available for selection. If you change the vehicle type and the currently selected valve type is not valid for that vehicle, a valve type no longer appears on the Valve Type button and you need to reselect a valve.

6. Enter vehicle dimensions: Press **Vehicle Dimensions** to display the Vehicle Dimensions screen.

Note: If your system is set up for U.S. units you will see two fields for each dimension (ft and in). If your system is set up for metric units you will only see one field (m).

Using the keypad to enter values, complete the following, then press **Done**.

- Hitch Length: Press either **Hitch Length** field (Front or Rear) then enter a value.
- Antenna Pivot: Press the **Antenna Pivot** field, enter a value, then press **Front** (antenna in front of vehicle pivot point) or **Back** (antenna behind vehicle pivot point).

  See “Antenna Pivot” on page 52 for more information on this setting.
- Antenna L/R Offset: Press the **Antenna L/R Offset** field, enter a value, then press **Left** (antenna left of vehicle centerline) or **Right** (antenna right of vehicle centerline).

  See “Antenna Offset” on page 53 for more information on this setting.

  Note: You can leave this as 0.00 when first working through this step of vehicle setup.
- Wheelbase: Press the **Wheelbase** field then enter a value. Wheelbase of a vehicle is the distance between the centers of its two axles.
- Antenna Height: Press the **Antenna Height** field then enter a value.

7. Calibrate the vehicle:

   a. Press **Vehicle Calibration**. The Vehicle Calibration panel appears (shown near right). If you selected ESi as the valve type in step 5, only buttons related to ESi appear on the Vehicle Calibration screen (far right.

      Only the ECU Orientation field is active. You must complete the calibration steps in order. After you complete one of the steps shown at right the button below that step becomes active (or multiple buttons become active).

Note: For some tractor models, messages may appear during the calibration process that instruct you to perform tasks specific to these models. Follow the instructions onscreen to continue/complete your calibration.

   b. Press **ECU Orientation**. The ECU Orientation panel appears (shown below). Press **Top** and select an option, press **Connectors** and select an option, press **Apply Changes**, then press **Done**.

      On the ECU orientation panel you set the orientation of the top of the ECU (the face with the cooling fins) and of the two connectors. The connector orientation options are dependent on the orientation of the ECU's top so you set the top position first.

The panels that appear for certain calibration steps have a status bar that indicates if you have met the conditions for that step. For example, if the step instructs you to drive less than a certain speed it shows a red bar (below right) if you are driving too fast or a green bar (below left) if you are driving within the correct range. Pay attention to the speed indicator to help guide you through the calibration process. When instructed to center the steering aim at a specific landmark to ensure you are driving the vehicle in a straight line.

Green - within range

Red - outside range

c. On the Vehicle Calibration panel press the button following ECU Orientation (such as Curvature if you selected ESi as the valve type) and follow the onscreen prompts. Repeat this process for each additional button on the Calibration panel. After successfully calibrating your vehicle go to step 8 to continue vehicle setup.

8. Set the steering sensitivity: Press **Sensitivity**, drag the slider or press the left/right arrows to set the level, then press **Close**.

   Sensitivity is how aggressive the vehicle will try to stay on the line; it ranges from 1 to 20. *The default is 7.*

   See “Steering Sensitivity” on page 63 for more information.

9. Set the steering attack: Press **Attack**, drag the slider or press the left/right arrows to set the level, then press **Close**.

   Attack is how aggressive a vehicle will try to acquire the line; it ranges from 1 to 10. *The default is 10.*

   See “Steering Attack” on page 64 for more information.

10. Press **Save** to save your vehicle settings. The new vehicle name appears on the Current Vehicle button.
11. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Editing a Vehicle

You can edit only the currently loaded vehicle.

1. Press **Menu > Vehicle Profiles > Current Vehicle**. The Edit Vehicle Profile panel appears.
2. Edit the desired settings, similar to entering the settings when adding a vehicle (see the previous section “Adding a Vehicle”).

Loading a Vehicle

Each vehicle you create in MAX is saved to memory creating a list of vehicles. You can then load the appropriate vehicle from this list. When you load a vehicle, that vehicle’s settings (such as color and calibration parameters) are loaded as well.

To load a vehicle:

1. Press **Menu > Vehicle Profiles > Previous Vehicles**. The Previous Vehicles panel appears.
2. Use the up/down scroll buttons to scroll through the list of vehicles (if necessary) then select the desired vehicle. The Previous Vehicle panel closes and the selected vehicle appears on the Current Vehicle button.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Importing a Vehicle

You must have a USB drive plugged into one of the USB ports on the terminal to import a vehicle; otherwise, the functionality is disabled (Import Vehicles button on the Vehicle Profiles panel is unavailable/dimmed). The USB drive must contain a 'vehicles' folder at the root level of the drive and all vehicle files must be in this folder. For example, if your USB drive is drive M on your PC then your vehicle files should be in the following folder: *M:\vehicles*

Once you import a vehicle you can load, export, or delete it.

To import a vehicle:

1. Press **Menu > Vehicle Profiles > Import Vehicles**. The Import Vehicles panel appears.
2. Use the up/down scroll buttons to scroll through the list of vehicles (if necessary) then select the vehicles you want to import. If you want to import all vehicles press **Select All**.
3. Press **Import**. The vehicles are imported and the panels close.

Note: If MAX already contains a vehicle of the same name you are importing, MAX prompts you to confirm/cancel importing that vehicle. Confirming the import overwrites the vehicle on your terminal.

Exporting a Vehicle

You must have a USB drive plugged into one of the USB ports on the terminal to export a vehicle; otherwise, the functionality is disabled (the Export Vehicles button on the Vehicle Profiles panel is dimmed / not available). When you export a vehicle to a USB drive MAX creates a 'vehicles' folder on USB drive and copies the VEHICLE file to that folder. For example, if you have a vehicle profile named 'TestVehicle1' and export that vehicle to a USB drive it will appear as follows: *TestVehicle1.vehicle*

To export a vehicle:

1. Press **Menu > Vehicle Profiles > Export Vehicles**. The Export Vehicles panel appears.
2. Use the up/down scroll buttons to scroll through the list of vehicles (if necessary) then select the vehicles you want to export. If you want to export all vehicles press **Select All**.
3. Press **Export**. The vehicles are exported and the panels close.

Note: If the USB drive already contains a vehicle of the same name you are exporting, MAX prompts you to confirm/cancel exporting that vehicle. Confirming the export overwrites the vehicle on the USB drive.

Deleting a Vehicle

Caution: *Deleting a vehicle permanently removes the vehicle and its calibrations—you cannot retrieve a deleted vehicle.*

You cannot delete the current vehicle—only vehicles that are not the current vehicle will appear in the Delete Vehicles list.

To delete a vehicle:

1. Press **Menu > Vehicle Profiles > Delete Vehicles**. The Delete Vehicles panel appears.
2. Use the up/down scroll buttons to scroll through the list of vehicles (if necessary), then select the vehicles you want to delete. If you want to delete all vehicles press **Select All**.
3. Press **Delete**. A message appears asking if you are sure you want to delete the selected vehicles.

4. Press **Yes**. The vehicles are deleted and no longer appear in the list on the Delete Vehicles panel.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Working with Implements

An implement in MAX refers to machinery attached to your vehicle, such as a sprayer, planter, or tillage equipment. You can add as many implements to MAX as you want and then select the one you need for your job. MAX stores certain information—such as implement geometry and eTurns setup—with each implement.

The selected implement appears on the map screen below the selected vehicle (implement and vehicle shown at right). The distance between the implement and the vehicle is determined by the front/back implement offset—see “Setting the Front/Back Implement Offset” on page 81.

You use the Implement Profiles panel (shown at right) as the starting point for performing the following implement tasks:

- Add an implement
- Edit an implement
- Load a previous (existing) implement
- Import an implement
- Export an implement
- Delete an implement

Note: If eDriveX is connected to MAX and you entered a valid eTurns subscription, the eTurns Calibration button on the New Implement Profile panel and Edit Implement Profile panel is available after you complete the previous implement setup steps (using the buttons above the eTurns Calibration button on these panels). Without a valid eTurns subscription the eTurns button is always dimmed (unavailable). See “eTurns” on page 156 for more information about eTurns functionality.

Implement Offsets

In MAX you can set two offsets for your implement:

- Left or right offset
- Front or back offset

See the following sections for an overview of each type of implement offset as well as instructions on how to set each offset.

Left/Right Implement Offset

The left/right implement offset is the lateral (perpendicular) distance between the center of the implement and the centerline of the vehicle. When 'calibrating an implement offset' you are actually compensating for a physical implement offset. And to compensate for physical implement offset you:

- Measure the effect of the uncompensated implement offset
- Calculate the offset adjustment required
- Enter the calculated adjustment to compensate for the physical implement offset

Calibration is required if the vehicle successfully repeats its passes while driving up and down on a straight A=B line without an implement, but still shows an offset (skip or overlap) during field work with an implement attached. In this case it is likely that the implement is not centered in relation to the centerline of the vehicle. To compensate for this you need to complete a left/right implement offset calibration for each implement that is used with MAX.

The left/right implement offset—for which you will compensate—comprises a measured distance (the amount of the offset) and a direction (left or right of vehicle centerline). In the figure at right, the offset distance (or amount) is X, the direction is right.

Because it is difficult to measure the implement offset on the vehicle/implement combination, you must determine the offset in the field to ensure maximum field work accuracy.

Note: The calibration only compensates for a static left/right implement offset that is caused by the physical dimensions of the implement. It does not prevent offsets that are caused by dynamic movements of the implement, like drift on a slope, for example.

There are two ways to determine the left/right implement offset. The following section describes the preferred method. There is a brief description of the other method after the following step-by-step guidance through the preferred method. See also "Setting the Left/Right Implement Offset - Alternative Method" on page 80.

Setting the Left/Right Implement Offset - Preferred Method

This method for determining the left/right implement offset is the preferred method because it eliminates the possibility of errors caused by an incorrect vehicle width (see “Adding a Vehicle” on page 67).

Figure 3-1: Determining the effect of implement offset

To determine left/right implement offset:

1. Set a straight A=B line (see “Setting an A=B Line” on page 133).
2. Maintaining a speed of 5 kph (3 mph) engage steering and, with good crosstrack and with the implement straight, let the system steer you along the wayline for at least 100 m. Ensure the implement is in sufficient contact with the ground to leave a visible swath. See Pass 1 in Figure 3-1.
3. Perform a keyhole turn, re-engage the steering, and let the system steer you down the same wayline, again with good cross track and with the implement straight. See Pass 2 in Figure 3-1.
4. Measure the effect of the uncompensated implement offset shown in Figure 3-1 (1.00 m in example)—it is the width of the first swath not covered by the second swath.

5. Divide the measurement by two. This is the amount of the physical offset of the implement—the offset you need to compensate for and need to enter as the Left or Right implement offset in the Implement Configuration screen (see step 7 below)—so 0.5 m in Figure 3-1 (and see step 8 below).
6. Determine the direction of the offset—this is the left or right direction of the implement's centerline relative to the vehicle centerline when viewed in the direction of travel. See Figure 3-1 for examples of both a left and right offset.
7. Press **Menu > Implement Profiles > Current Implement > Implement Config**. The Implement Configuration screen appears.

8. Enter the left or right implement offset:
   a. Press the **Left** or **Right** field (white box).
   b. Enter an offset value using the keypad on the right of the screen. After you enter the value the implement on this screen moves to the position indicated by the offset; for example, if you enter a Right offset the implement moves to the right.
   c. Press **Done**. The value is entered and the screen closes.

9. On the Edit Implement Profile panel press **Save**. The Edit Implement Profile panel closes and the new implement position is indicated on the map.

Implement offset entered in Implement Configuration screen (left) and resulting implement shift on map (below)

10. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.
11. Test the completed calibration by letting the system control up and down on a new A=B line. The second swath should overlay the first exactly. If it does not, repeat the calibration.

If test results still show skips or overlaps after calibrating both the antenna and implement offsets, make sure the implement width (Width button on Edit Implement Profile panel, shown at right) is correct.

Setting the Left/Right Implement Offset - Alternative Method

With this method, instead of driving two passes on the same guideline—one in each direction—you drive three passes on adjacent guidelines. Depending on the direction of your implement offset (left or right), you will get a skip or an overlap on the second pass and the opposite on the third pass.

Figure 3-2: Three-Pass method for determining implement offset

The amount of skip and overlap will be the same. Whichever you measure (2X) divide it in half and enter the result as the implement offset (X) along with the direction of the offset, which is left in the example (start at step 7 of the previous section “Setting the Left/Right Implement Offset - Preferred Method”).

Note: If the offset was to the right, Pass 2 would produce overlap, Pass 3 would produce skip.

Front/Back Implement Offset Overview

The front/back implement offset is the perpendicular distance between the vehicle's pivot point and the application line (spray impact point, seed drop point, etc) of the implement. The front/back implement offset affects the section control 'on/off' points and the variable rate control 'change' points as the implement passes over preset boundaries, previously worked areas, or prescription map areas.

Setting the Front/Back Implement Offset

If the application line of the implement is behind the vehicle pivot point (you selected Rigid Rear or Trailed as the mount type), measure the distance from the antenna pivot point to the application line and enter this value as the back offset—the implement will trail behind the vehicle on the map screen.

If the application line of the implement is in front of the vehicle pivot point (you selected Rigid Front as the mount type), measure the distance from the antenna pivot point to the application line and enter this value as the front offset—the implement will be in front of the vehicle on the map screen.

To set the front/back implement offset:

1. Press **Menu > Implement Profiles > Current Implement > Implement Config**. The Implement Configuration screen appears.

2. Enter the front or back implement offset:
   a. Press the **Front** or **Back** field (white box).
   b. Enter an offset value using the keypad on the right of the screen. After you enter the value the implement on this screen moves to the position

indicated by the offset; for example, if you enter a Front offset the implement moves to the front.

c. Press **Done**. The value is entered and the screen closes.

Note: Based on the location of the application line of the implement, you may need to set a combination of left/right and front/back offsets on the implement.

Adding an Implement

You must add a vehicle and an implement before you can begin a job. When you add an implement it remains in memory.

Note: If you will be using an ISOBUS-enabled implement with MAX you must first set up the implement using the ISOVT window. You then have to set up the Task Controller for the implement and this process is similar to some of the steps below when setting up a non ISOBUS-enabled implement with AC110. Some implement settings you enter in the ISOVT window populate similar fields on the MAX side—via the Edit Implement Profile panel—and typically include such fields as Width (implement width), Number of Sections (section control), and Section Location/ Width (section control). These fields will be disabled on the MAX side since they are determined by the settings in the ISOVT window.

For more information on ISO VT and ISO-enabled implement setup refer to your implement documentation and see “ISOBUS Settings” on page 37 and “ISO VT” on page 43.

To add an implement:

1. Press **Menu > Implement Profiles > New Implement**. The New Implement Profile panel appears (top of panel shown at right). Only the Name field is available.

   As you enter field values more buttons become available. For example, after you enter the Name the Mount Type button becomes available.

2. *Enter the implement name:* Press **Name**, enter a name in the Enter Name window, then press **Done**. The new implement name appears on the Name button.

   Tip! *Use names you will recognize if entering many implements.*

3. *Select the mount type:* Press **Mount Type** then press a mount type on the Mount Type panel (top of panel shown at right). The selected type appears on the Mount Type button. Rigid implements are mounted to the vehicle either through a 3-point or a boom on a self propelled sprayer.

4. *Enter the implement width:* Press **Width**, using the Width keypad (shown at right) press the ft and/or in (or meters) field and enter a value, then press **Done**. The value appears on the Width button.

5. *Enter implement configuration (offset and skip/overlay):* Press **Implement Config** to display the Implement Configuration screen (shown below).

   The Implement Configuration screen contains a keypad on the right and either the Implement Offset area (shown in step a) or the Skip/Overlap Distance area (shown on the next page in step b) on the left—you toggle between these areas using the button below the keypad. When you first press Implement Config the Implement Offset area appears and the button below the keypad shows Skip/Overlap. Pressing the Skip/Overlap button displays the Skip/Overlap area and the button changes to Implement Offset.

   a. For Implement Offset: Press the ft and/or in (or meters) field for any of the measurements (Front, Right, Back, or Left) then enter a value using the keypad. Repeat for each of the remaining measurements.

b. For Skip/Overlap: Press the ft and/or in (or meters) field for either Skip or Overlap then enter a value using the keypad. Set this value to drive a pattern where rows intentionally skip or overlap. When you enter a skip or overlap the map screen shows this as an area between swaths in the green coverage lines, where a skip is the non-sprayed area between swaths and an overlap is the dark green overlap between swaths. If section control is enabled, the following two conditions must be met for overlap to work properly (otherwise, section control will turn off the outside sections and not allow overlap):

- Overlap width must be less than the width of the outside sections.
- Section control Coverage must be set at 100% (see Table 8-9 on page 203 for more information on Coverage).

6. *Select an operation:* Press **Operation** and on the Select Operation panel (top of panel shown at right) press the desired operation.

(OPTIONAL): If you are applying two different products, complete step 7; otherwise, go to step 8.

7. Select the desired product load split: Press **Split Load** then on the Split Load screen (top half of screen shown below) select the desired split by:
   - Dragging the split load slider left or right
   - Pressing an area to the left or right of the split load slider

See “Split Loads” on page 102 for more information.

(OPTIONAL): If your MAX configuration includes rate and/or section control functionality complete step 8 or 9 for rate control and step 10 for section control; otherwise, go to step 11.

The New Implement Profile panel (and the Edit Implement Profile panel) at right displays different buttons depending on the selected operation type.

- For liquid or NH3 operations, the Rate Control Settings and Split Load buttons are available. *Go to step 8 to configure liquid rate control.*
- For dry operations, the Conveyor Control Settings and Spinner Control Settings buttons are available. *Go to step 9 to configure dry rate control.*
- For liquid/NH3 and dry operations, the Section Control button is available. *Go to step 10 to configure section control.*

8. Complete this step for liquid/NH3 rate control.

Note: Review "Configuring Your Implement for Rate Control" on page 174 before continuing, as this section contains detailed information on all liquid rate control settings.

a. On the New Implement Profile panel press **Rate Control Settings**. The Rate Control Settings panel appears (shown at right).

b. Press **Controller Type** then on the Controller Type panel select a type. The selected controller type appears on the Controller Type button.

c. Press **Rate Valve** and on the Valve Type panel set Positive Close to Off or On then select a valve type. The selected valve type appears on the Rate Valve button.

d. (Optional) Press the **Open Valve** and **Close Valve** buttons to manually open and close the regulating valve to identify if an incorrect Rate Valve option was selected or if a cable is not connected (you can see if the valve is turning and verify you selected the correct valve type).

e. Press **Parameters** then on the Rate Control Parameters panel (top of panel shown at right) complete the following:

– (For variable rate applications only) Press **On Look Ahead**, enter a value (in seconds) in the On Look Ahead data entry window, then press **Done**. The entered value appears on the On Look Ahead button.

– Press **LowFlow Setting**, enter a value in the LowFlow Setting data entry window, then press **Done**. The entered value appears on the LowFlow Setting button.

– (For PWM and motorized valves only) Press **Valve Advance**, enter a value in the Valve Advance data entry window, then press **Done**. The entered value appears on the Valve Advance button.

– Select the **Remote Master** check box to enable an ISOBUS ECU remote switch to function as the Apply button. This check box is enabled when an ISOBUS implement is selected as the rate controller.

– Press **Back** when you are finished with this panel to return to the Rate Control Settings panel.

f. Press **Calibration** then on the Calibrate Rate Control panel complete the following (see “Calibrating Rate Control” on page 185 for information on the Calibrate Rate Control panel):

   – Press **Meter Calibration**, enter a value in the Meter Calibration data entry window, then press **Done**. The entered value appears on the Meter Calibration button and the System Calibration button is now available.

   – Press **Pressure 1 Calibration**, enter a value in the Pressure 1 Calibration data entry window, then press **Done**. The entered value appears on the Pressure 1 Calibration button. Repeat for Pressure 2.

   – Press **System Calibration**, press **Yes** in the Calibrate window (a progress message appears during calibration), then press **Ok**.

   – Press **Calibration Values** to display the Calibration Values panel. For each value, press the button, enter a value in the data entry window that appears, then press **Done**. Then press **Back** to return to the Rate Control Settings panel.

g. (Optional) Press **NH3** and select On or Off.

h. Press **Close** to return to the New (or Edit) Implement Profile panel.

9. Complete this step for dry rate control.

Note: Review “Configuring Your Implement for Rate Control” on page 174 before continuing, as this section contains detailed information on all dry rate control settings.

a. On the New (or Edit) Implement Profile panel press **Conveyor Control Settings**. The Conveyor Control Settings panel appears (shown at right).

   Note: When the Conveyor Control Settings panel first appears only the Controller Type and On Look Ahead buttons appear (with the On Look Ahead button unavailable). When you select a controller type in step b below the rest of the buttons shown at right appear (with the On Look Ahead button now available) and the Product Details tab appears on the map screen.

b. Press **Controller Type** then on the Controller Type panel select a type. The selected controller type appears on the Controller Type button.

c. Press **Conveyor Type** and on the Conveyor Type panel set Positive Close to Off or On then select a conveyor type. The selected conveyor type appears on the Conveyor Type button.

d. (Optional) Press the **Start Conveyor** and **Stop Conveyor** buttons to manually open and close the regulating valve to identify if an incorrect Conveyor Type option was selected or if a cable is not connected.

e. (For variable rate applications only) Press **On Look Ahead**, enter a value (in seconds) in the On Look Ahead data entry window, then press **Done**. The entered value appears on the On Look Ahead button.

f. Press **Calibration** then on the Calibrate Conveyor panel complete the following (see “Calibrating Rate Control” on page 185 for information on the Calibrate Conveyor panel).

Note: When the Calibrate Conveyor panel first appears only the Conveyor Calibration button is unavailable. You must enter density calibration and gate height values to enable this button.

– Press **Density Calibration**, enter a value in the Density Calibration data entry window, then press **Done**. The entered value appears on the Density Calibration button.

– Press **Gate Height**, enter a value in the Gate Height data entry window, then press **Done**. The entered value appears on the Gate Height button and the Conveyor Calibration button is now available.

– Press **Conveyor Calibration**, follow the onscreen directions, then press **Yes** in the Calibrate window (a progress message appears during calibration). Press **Stop** when there is enough material in the container, then weigh the material for use in the Volume Calibration field (next step).

– Press **Volume Calibration**, enter a value in the Volume Calibration data entry window, then press **Done**.

– Press **System Calibration**, press **Yes** in the Calibrate window (a progress message appears during calibration), then press **Ok**.

– Press **Calibration Values** to display the Calibration Values panel. For each value, press the button, enter a value in the data entry window that appears, then press **Done**. Then press **Back** twice to return to the New (or Edit) Implement Profile panel.

g. On the New (or Edit) Implement Profile panel press **Spinner Control Settings**. The Spinner Control Settings panel appears (shown at right).

Note: When the Spinner Control Settings panel first appears only the Controller Type and Spinner Speed buttons appear (with the Spinner Speed button unavailable). When you select a controller type in step h below the rest of the buttons shown at right appear (with the Spinner Speed button now available).

h. Press **Controller Type** then on the Controller Type panel select a type. The selected controller type appears on the Controller Type button.

i. Press **Spinner Type** and on the Select Spinner Type panel select a spinner type. The selected spinner type appears on the Spinner Type button.

j. Press **Spinner Speed**, enter a value in the Spinner Speed data entry window, then press **Done**. The entered value appears on the Spinner Speed button.

k. (Optional) Press the **Start Spinner** and **Stop Spinner** buttons to manually open and close the regulating valve to identify if an incorrect Spinner Type option was selected or if a cable is not connected.

l. Press **Calibration** then on the Calibrate Spinner panel complete the following (see “Calibrating Rate Control” on page 185 for information on the Calibrate Spinner panel).

Note: When the Calibrate Spinner panel first appears the System Calibration button is unavailable. You must enter a sensor count value to enable this button.

– Press **Sensor Count**, enter a value in the Sensor Count data entry window, then press **Done**. The entered value appears on the Sensor Count button.

– Press **System Calibration**, press **Yes** in the Calibrate window (a progress message appears during calibration), then press **Ok**.

Note: System calibration requires you to cycle power to the AC110. You can then return to the Calibrate Spinner panel to complete the next step.

– Press **Calibration Values** to display the Calibration Values panel. For each value, press the button, enter a value in the data entry window that appears, then press **Done**. Then press **Back** twice to return to the New (or Edit) Implement Profile panel.

10. *Enter section control settings:* Press **Section Control** to display the Section Control panel then complete the following (see “Setting Up Section Control” on page 203 for more information on the Section Control panel).

Note: When the Section Control panel first appears only the Controller Type button is available (with the Section Valve and External Switches buttons not visible). When you select a controller type in step a below the remaining buttons become available (with the two missing buttons now visible). Also, the Section Valve and Number of Sections buttons are unavailable if you select Spreading as your operation.

a. Press **Controller Type** then on the Controller Type panel select a type. The selected type appears on the Controller Type button.

b. Press **Section Valve** then on the Valve Type panel press the desired type. The selected type appears on the Section Valve button.

c. Press **Number of Sections** then in the Number of Sections data entry window enter a value then press **Done**. The entered value appears on the Number of Sections button.

d. Press **Section Location/Width**. In the Section Widths panel do one of the following:

– Press **Auto-Locate** to divide the sections equally based on the implement width.

– Press each section button, enter a value in the corresponding data entry window, then press **Done**.

e. For **Coverage**, **On-Time**, and **Off-Time**, press the button, enter a value in the data entry window, then press **Done**.

f. Press **External Switches** (place check mark in box) to use the joystick or boom switches built into your vehicle (instead of using the map screen indicators/buttons) to turn Apply button ON and OFF and toggle individual sections between ON and AUTO.

g. Press **Back** to return to the New (or Edit) Implement Profile panel

If you have an eTurns subscription complete step 11; otherwise, go to step 12.

11. Press **Calibration** then on the Implement Calibration panel press **eTurns**. The eTurns Calibration panel appears showing Step 1 of 5. Follow the directions on the screen, press **Next** when instructed, and press **Done** when calibration is complete.
12. Press **Save** to save your implement settings. The new implement name appears on the Current Implement button.
13. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Editing an Implement

You can edit only the currently loaded implement.

1. Press **Menu > Implement Profiles > New Implement**. The New Implement Profile panel appears (panel with Operation = Spraying shown at right).
2. Edit the desired settings, similar to entering the settings when adding an implement (see the previous section “Adding an Implement”).

Loading a Previous Implement

Each implement you create in MAX is saved to memory creating a list of implements. When you load an implement it will use the dimensions and any section and rate control setup for that implement.

1. Press **Menu > Implement Profiles > Previous Implement**. The Implement Profiles panel displays the Filter drop-down button and a scroll list of implements.
2. Press **Filter** then select a type to show only implements of that type in the scroll list. Pressing All Types (default) displays all implements in the scroll list, regardless of type.
3. Use the up/down scroll buttons to scroll through the list of implements (if necessary) then press to select the desired implement. The panel closes and the selected vehicle appears on the Current Implement button.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Importing an Implement

Importing implements enables you to import setup information for implements already set up in another MAX terminal.

You must have a USB drive plugged into one of the USB ports on the terminal to import an implement; otherwise, the functionality is disabled (the Import Implements button on the Implement Profiles panel is dimmed / not available).

The USB drive must contain an 'implements' folder at the root level of the drive and all implement files must be in this folder. For example, if your USB drive is drive M on your PC then your implement files should be in the following folder: *M:\implements*

To import an implement:

1. Press **Menu > Implement Profiles > Import Implements**. The Import Implements panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of implements then press to select the implements you want to import. If you want to import all implements press **Select All**.
3. Press **Import**. The implements are imported and the panels close.

Note: If MAX already contains an implement of the same name you are importing, MAX prompts you to confirm/cancel importing that implement. Confirming the import overwrites the implement on your terminal.

Exporting an Implement

You must have a USB drive plugged into one of the USB ports on the terminal to export an implement; otherwise, the functionality is disabled (the Export Implements button on the Implement Profiles panel is dimmed / not available).

When you export an implement to a USB drive, MAX creates an 'implements' folder on the drive and copies the IMPL file to that folder. For example, if you have an implement profile named 'TestImplement1' and export that implement to a USB drive it appears as follows: *TestImplement1.impl*

To export an implement:

1. Press **Menu > Implement Profiles > Export Implements**. The Export Implements panel appears.
2. Use the up/down scroll buttons to scroll through the list of implements then select the implements to export. If you want to export all implements press **Select All**.
3. Press **Export**. The implements are exported and the panels close.

Note: If the USB drive already contains an implement of the same name you are exporting, MAX prompts you to confirm/cancel exporting that implement. Confirming the export overwrites the implement on the USB drive.

Deleting an Implement

Caution: *Once you delete an implement it is permanently removed from memory; you cannot retrieve a deleted implement.*

You cannot delete the current implement—all other implements will appear in the Delete Implements list.

To delete an implement:

1. Press **Menu > Implement Profiles > Delete Implements**. The Delete Implements panel appears.
2. Use the up/down scroll buttons to scroll through the list of implements (if necessary) then select the implements to delete. If you want to delete all implements press **Select All**.
3. Press **Delete**. A message appears asking if you are sure you want to delete the selected implements.

4. Press **Yes**. The implements are deleted and no longer appear in the list on the Delete Implements panel.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Chapter 4: Operator and Product Profiles

Operator Profiles
Product Profiles

Operator Profiles

An operator in MAX refers to the user operating the vehicle. The operator name will be included as part of the log file for historical purposes. You can add ss many operators to MAX as you want and then select the one you need for your job. The first time you turn on the system there are no operators. After adding an operator (or operators) upon powerup, MAX will (by default) use the operator profile that was used prior to the terminal being powered down.

You use the Operator Profiles panel (shown at right) as the starting point for performing the following operator tasks:

- Adding an operator
- Editing an operator
- Loading a previous operator
- Importing an operator
- Exporting an operator
- Deleting an operator

Adding an Operator

When you add an operator it remains in memory, even if you move the terminal to another vehicle. Although only the Operator Name field is required, you should enter all the data that is relevant to your situation. For example, if you want to keep track of Operator IDs and Licenses, then you should enter these values.

To add a new operator:

1. Press **Menu > Operator Profiles > New Operator**. The New Operator Profile panel appears (shown at right).
2. *Enter the operator name:* Press **Operator Name**, enter a name in the Enter Operator Name window (shown below), then press **Done**. The new operator name appears on the Operator Name button.

   Tip! *Use names you will recognize if entering many operators.*

3. *Enter the operator ID:* Press **Operator ID**, enter an ID in the Enter Operator ID window (similar to the Enter Operator Name window), then press **Done**. The new operator ID appears on the Operator ID button.
4. *Enter the operator license:* Press **Operator License**, enter a license in the Enter Operator License window (similar to the Enter Operator Name window), then press **Done**. The new operator license appears on the Operator License button.
5. *Enter the operator contact information:* Press **Operator Contact Info**, enter the contact information in the Enter Operator Contact Info window (similar to the Enter Operator Name window), then press **Done**. The new operator contact information appears on the Operator Contact Info button.

   The panel at right shows all four fields completed.
6. Press **Save** to save your operator profile settings. The new operator name appears on the Current Operator button.
7. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Editing an Operator

You can edit only the currently loaded operator.

To edit an operator:

1. Press **Menu > Operator Profiles > Current Operator**. The Edit Operator Profile panel appears (shown at right).
2. Edit the desired settings, similar to entering the settings when adding an operator (see the previous section "Adding an Operator").

Loading a Previous Operator

Each operator you create in MAX is saved to memory creating a list of operators. You can then load the appropriate operator from a list of operators.

To load a previous operator:

1. Press **Menu > Operator Profiles > Previous Operators**. The Previous Operators panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of operators (if necessary) then press to select the desired operator. The Previous Operators panel closes and the selected operator appears on the Current Operator button.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Importing an Operator

You must have a USB drive plugged into one of the USB ports on the terminal to import an operator; otherwise, the functionality is disabled (the Import Operators button on the Operator Profiles panel is dimmed / not available).

The USB drive must contain an 'operators' folder at the root level of the drive and all operator files must be in this folder. For example, if your USB drive is drive M on your PC then your operator files should be in the following folder: *M:\operators*

To import an operator:

1. Press **Menu > Operator Profiles > Import Operators**. The Import Operators panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of operators (if necessary) then press to select the operators you want to import. If you want to import all operators press **Select All**.
3. Press **Import**. The operators are imported and the panels close.

Exporting an Operator

You must have a USB drive plugged into one of the USB ports on the terminal to export an operator; otherwise, the functionality is disabled (the Export Operators button on the Operator Profiles panel is dimmed / not available).

When you export an operator to a USB drive MAX creates an 'operators' folder on USB drive and copies the operator file to that folder. For example, if you have an operator profile named 'TestOperator1' and export that operator to a USB drive it will appear as follows: *TestOperator1.operator*

To export an operator:

1. Press **Menu > Operator Profiles > Export Operators**. The Export Operators panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of operators (if necessary) then press to select the operators you want to export. If you want to export all operators press **Select All**.
3. Press **Export**. The panels close and an export progress message appears. When the export is complete the message closes.

Note: If the USB drive already contains an operator of the same name you are exporting, MAX prompts you to confirm/cancel exporting that operator. Confirming the export overwrites the operator on the USB drive.

Deleting an Operator

Caution: *Once you delete an operator it is permanently removed from memory; you cannot retrieve a deleted operator.*

You cannot delete the current operator—only operators that are not the current operator will appear in the Delete Operators list.

To delete an operator:

1. Press **Menu > Operator Profiles > Delete Operators**. The Delete Operators panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of operators (if necessary) then press to select the operator(s) you want to delete. If you want to delete all operators press **Select All**.
3. Press **Delete**. A message appears asking if you are sure you want to delete the selected operator(s).

4. Press **Yes**. The operator(s) are deleted and no longer appear in the list on the Delete Operators panel.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Product Profiles

A product in MAX refers to chemical, feed, or fertilizer that you add to your field. The product name will be included as part of the log file for historical purposes. You can add as many products to MAX as you want and then select the one you need for your job. The first time you turn on the system there are no products. After adding an product (or products) upon powerup, MAX will (by default) use the product profile that was used prior to the terminal being powered down.

You use the Product Profiles panel (shown at right) as the starting point for performing the following product tasks:

- Adding a product
- Editing a product

Adding a Product

When you add a product it remains in memory, even if you move the terminal to another vehicle.

To add a new product:

1. Press **Menu > Product Profiles > New Product**. The New Product Profile panel appears (to of panel shown at right).
2. *Enter the product name:* Press **Product Name**, enter a name in the Enter Product Name window (shown below), then press **Done**. The new product name appears on the Product Name button.

   Tip! *Use names you will recognize if entering many products.*

3. *Enter the product type:* Press **Product Type**. The Select Product Type panel appears (top of panel shown at right). You can enter one of three types: chemical, seed, or fertilizer.

Based on the type you select, buttons related to the type appear on the panel (as indicated by an 'X' in the last three columns of the following table and by the panels below the table). Press the appropriate buttons on the panel and make the desired selections. For example, you will need to make a selection for Carrier and Physical State for the Fertilizer type. Each selection is displayed on that button.

When you are finished making your selections press Save (you are returned to the Product Profiles panel).

Button	Action	Chemical	Seed	Fertilizer
Carrier	Select Yes or No from the drop-down.	X		X
Physical State	Press to display the Select Physical State panel where you select either Liquid or Solid.	X		X
Manufacturer	Press to display the Select Manufacturer panel where you select the appropriate manufacturer.	X	X	
Chemical Type	Press to display the Select Chem Type panel where you select the appropriate chemical type.	X		
Commodity	Press to display the Select Commodity panel where you select the appropriate commodity.		X	
Blend	Select Yes or No from the drop-down.			X
Filler	Select Yes or No from the drop-down.			X

4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Editing a Product

You can edit any products you have previously saved.

To edit a product:

1. Press **Menu > Product Profiles > Edit Products**. The Select Product to Edit panel appears (shown at right).
2. Select the product you want to edit then edit the desired settings, similar to entering the settings when adding a product (see the previous section “Adding an Operator”).

Split Loads

Split loads allow you to map and log two different products or seed varieties from one implement. The implement is separated in two sections: one product on the left and the other on the right. You can adjust how many sections use one product and how many sections use the other or have all the sections use just one product.

For example, if you have an 8-section implement:

- Over an entire field you can apply Product 1 using the four left sections (yellow in figure below) and apply Product 2 using the four right sections (purple in figure below).
- Over part of the field you can apply Product 1 using all eight sections and then over the remaining part of the field you can apply Product 2 using all eight sections.

MAX maps and logs the two varieties.

You determine the split load settings while adding or editing an implement (for more information see the previous two sections—“Adding a Product” and “Editing a Product”).

Chapter 5: Jobs and Job Templates

Jobs Overview
Working with Jobs at Startup
Working with Jobs from the Map Screen
Working with Job Templates

This chapter provides an overview of jobs in MAX and instructions on working with jobs and job templates.

Jobs Overview

This section describes what a job is, how MAX numbers jobs, and what needs to occur before you start a job.

What is a Job?

A job is a field task you perform, such as spraying, tilling, or harvesting and is required for guidance and autosteering.

You can work with jobs in two ways:

- Using the Start Up Menu after powering on MAX (see “Working with Jobs at Startup” on page 105)
- Using the Jobs button on the Menu Options panel (see “Working with Jobs from the Map Screen” on page 106)

You can create job templates from existing jobs and use these templates to create similar new jobs.

Job Numbering

When you start a new job MAX automatically assigns it a job number (the job number appears on the expanded Indicator tab—see “Indicator Tab” on page 10 for details on what information the Indicator tab displays). The job number is based on the current date and the order of the job number. For example, MAX names the first job you start on April 2, 2013 as 13040201, where:

- 13 = year (2013)
- 04 = month (April, fourth month)
- 02 = day
- 01 = first new job on this date

If you start more than one new job on this date, MAX uses the same year, month, and day and orders the last two digits. For example, if you start three new jobs on April 2, 2013, MAX autonumbers them as follows:

- 13040201
- 13040202
- 13040203

Note: When you export jobs to a USB drive (see “Exporting a Job” on page 110) and then view the job files on your PC, the job files have a .Log file extension—this extension is hidden when you work with job files in MAX.

Before You Start A Job

Before you start a job you must perform the following:

- Verify you have a GPS signal

  On the Indicator tab in the upper right of the touchscreen verify the satellite indicator is green or orange.

  – If the satellite indicator is green or orange then the Jobs button on the Menu Options panel is enabled (you can start and work with jobs)

  – If the satellite indicator is red then the Jobs button on the Menu Options panel is disabled (you cannot start and work with jobs)

  See “Indicator Tab” on page 10 for GPS signal information.

- Add a vehicle (have at least one vehicle in MAX) - see “Adding a Vehicle” on page 67
- Add an implement (have at least one implement in MAX) - see “Adding an Implement” on page 82

Working with Jobs at Startup

After you start MAX and press I Accept on the Warning screen, MAX displays the Start Up Menu window.

First time starting MAX

If this is the first time you are starting MAX, you must first set up a vehicle and implement before starting a job (see “Starting Outback MAX the First Time” on page 3).

If you are restarting MAX and have previously worked with a job (bottom figure at right), you can begin working with jobs right away—see the following sections:

- “Starting Outback MAX after Working with a Job” on page 4)
- “Starting a New Job” on page 106
- “Loading a Previous Job” on page 107

Starting MAX after working with jobs

Working with Jobs from the Map Screen

Use the Jobs panel (shown at right) to work with jobs and job templates (see “Working with Job Templates” on page 113).

To display the Jobs panel, press **Menu > Jobs**.

Starting a New Job

See “Before You Start A Job” on page 105 for information on what you need to do before staring a job. When you start a job MAX automatically creates a job number for the job (see “Job Numbering” on page 104). When you start a new job MAX automatically closes the current job.

To start a job:

1. Press **Menu > Jobs > New Job**. The New Job panel appears (shown at right).

   The Client, Farm, Field, and Crop fields are optional. If you do not enter values for these fields MAX assigns default values.

   Note: It is recommended that Outback ConnX users assign values to these fields. If you have a ConnX account the top three fields (Client, Farm, and Field) have a green background, indicating you can sync this data with ConnX. See “ConnX Settings” on page 34 for more information on syncing data with ConnX.

2. Enter values for each field.

   You enter each of these items in similar steps (such as pressing the button, entering a value in the window that appears and pressing Done or selecting a

value from a panel list). The following steps (a through c) illustrate entering a new client.

a. Press **Client** to display the Select Client panel.

b. Press **New Client** to display the Enter New Client window.

c. Enter a name then press **Done**. The new client name appears on the Client button.

d. Repeat steps a through c for the rest of the fields on the New Job panel.

3. Press **Begin** then press **Close**. The panels close and the new job is started. The Path Planning and Apply buttons are now active and the newly created job number appears on the Indicator tab.

Loading a Previous Job

There are two ways to load a job:

- Load a job from a list of previous jobs (**Option 1** on next page)
- Continue (load) the most recently closed job to quickly continue the most recent job without having to search for that job from a list of jobs (**Option 2** on next page)

You can load a previous job if another job is already open—loading the job automatically closes the currently open job.

However, you can continue a job only if you have no jobs loaded.

- When you have a job loaded the top button on the Jobs panel is Current Job (shown near right)
- When you have no jobs loaded the top button on the Jobs panel is Continue Job (shown far right).

When you load a job:

- The job number appears in the Job field on the Indicator panel (see at right)
- Information associated with the job (such as swath lines, marks, and sprayed areas) appears on the map screen

When you load a previous job you can display all jobs available or you can filter by Client, Farm, and/or Field to narrow the list of jobs displayed.

Option 1 - Loading a Job from the List of Previous Jobs

1. Press **Menu > Jobs > Previous Jobs**. The Previous Jobs panel appears (shown at right) displaying all previous jobs.
2. (OPTIONAL) Display the desired list of jobs by filtering any of the following:
   a. Press **Client** then select a client option on the Select Client panel. The selected option appears on the Client button.
   b. Press **Farm** then select a farm option on the Select Farm panel. The selected option appears on the Farm button.
   c. Press **Field** then select a field option on the Select Field panel. The selected option appears on the Field button.
3. Press the up/down scroll buttons to move the list up or down until you see the desired job.
4. Press the desired job. The panels close and a *Loading Job* status message appears (as shown below).

When the job is loaded, the map screen displays job-related information (such as swath lines) and the Indicator tab shows the job number.

Option 2 - Continuing the Most Recently Closed Job

Press **Menu > Jobs > Continue Job**. The most recent job is loaded (the job number appears on the Indicator tab).

Importing a Job

You must have a USB drive plugged into one of the USB ports on the terminal to import a job; otherwise, the functionality is disabled (the Import Jobs button noted below is not available).

The USB drive must contain an 'S3Jobs' folder at the root level of the drive and all job files must be in this folder. For example, if your USB drive is drive M on your PC then your job files should be in the following folder: *M:\S3Jobs*

To import a job:

1. Press **Menu > Jobs > Import / Export > Import Jobs**. The Import Jobs panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of jobs then press to select the jobs you want to import. If you want to import all jobs press **Select All**.
3. Press **Import**. The panels close and an Importing Jobs status message appears then closes when the import is completed.

Note: If MAX already contains a job of the same name you are importing, MAX prompts you to confirm/cancel importing that job. Confirming the import overwrites the job on your terminal.

Exporting a Job

You can export two types of job files: job log files and job template files.

You must have a USB drive plugged into one of the USB ports on the terminal to export a job; otherwise, the functionality is disabled (the Export Jobs button noted below is not available).

When you export a job to a USB drive MAX creates a 'jobs' folder on the drive and copies the text file (.Log for job logs) and/or template (.tem for job templates) to that folder. For example, if you export job number 12041101 to a USB drive it will appear as follows: *12041101.Log*

You cannot export the current job—that is, you cannot export a job unless it has been closed. For example, you have three jobs and one of the jobs is open (current). When you display the Export Jobs panel the current job does not appear in the jobs list.

To export a job:

1. Press **Menu > Jobs > Import / Export > Export Jobs**. The Export Jobs panel appears.
2. Use the up/down scroll buttons to scroll through all the jobs files then press to select the jobs you want to export. If you want to export all jobs press **Select All**.

   Note: Select "USB" from the drop-down (at the top of the panel) if ConnX is connected.

3. Press **Export**. The panels close and an Exporting Jobs status message appears then closes when the export is completed.

Note: If the USB drive already contains a job of the same name you are exporting, MAX prompts you to confirm/cancel exporting that job. Confirming the export overwrites the job on the USB drive.

Renaming a Job

You can rename any job that is not the current job. To rename the current job you must first close it.

To rename a job:

1. Press **Menu > Jobs > Rename Jobs**. The Rename Jobs panel appears (top of panel shown at right).
   - If you have a current job open, the Last Job button is dimmed (not available), since you cannot rename the current job.
   - If no jobs are current (open), the Last Job button is available (as shown at right).

2. *Rename the last job:* Press **Last Job** to display the Enter New Job Name window. Enter the new job name then press **Done**. The new job name appears on the Last Job button on the Rename Jobs panel.

or

Rename a previous job: Press **Select Other Job** to display the Rename Previous Job panel (shown at right) then select a job in the list to display the Enter New Job Name window (shown above). Enter the new job name then press **Done**. The new job name appears on the Log button on the Rename Previous Job panel.

Closing a Job

In addition to closing a job manually (described here), the current job is closed automatically when you start a new job.

To close a job:

1. Press **Menu > Jobs > Close Job**. The job closes.
2. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Deleting Jobs and Associated Items

Caution: *Deleting a job permanently removes the job—you cannot retrieve a deleted job.*

You cannot delete the current job—that is, you cannot delete a job unless it has been closed. For example, you have three jobs and one of the jobs is open (current). When you display the Delete Jobs panel the current job does not appear in the jobs list.

You can also delete items associated with jobs—clients, farms, and fields. You cannot delete any of these items without first deleting all jobs associated with these items.

To delete a job or an item associated with a job:

1. Press **Menu > Jobs > Delete Items**. The Delete Items panel appears (top of panel shown at right).

> *Note: If your MAX terminal is authorized for ConnX, only the Delete Jobs button appears on the Delete Items panel. You must log into your ConnX account to delete associated clients, farms, and fields.*

2. Press the button for the item you want to delete. The Delete panel for that item type appears. For example, press **Delete Jobs** to display the Delete Jobs panel (below left) or press **Delete Farms** to display the Delete Farms panel (below right).

3. Use the up/down scroll buttons to scroll through the list of that particular item then press to select the items you want to delete. If you want to delete all items press **Select All**.
4. Press **Delete**. The item is deleted and the panels close.

Working with Job Templates

A job template allows you to reuse certain parameters of a job log file. For example, if you have a job log file with a specific client, farm, or boundary and you want to reuse that information for a different field you can save the original job log file as a template. When you then start a new job with this new field you will already have the client and farm information entered. Items that are stored in a template are include and exclude boundaries, A=B lines, pivots, guidance around a boundary, markers/flags, and client, farm, and field names.

Use the Templates panel (top of panel shown at right) as the starting point for performing the following job template tasks:

- Using a job template
- Creating a job template

To display the Templates panel, press **Menu > Jobs > Templates**.

Creating a Job Template

Similar to loading a previous job you can display all jobs available or you can filter by Client, Farm, and/or Field to narrow the list of jobs displayed.

You cannot create a job template from the current job—that is, you cannot create a job template from a job unless that job is closed. For example, you have three jobs and one of the jobs is open (current). When you display the Create Template panel the current job does not appear in the jobs list.

Note: Creating a job template does not close the current job nor does it create a job if you have no job active.

To create a job template:

1. Press **Menu > Jobs > Templates > Create Template**. The Create Template panel appears (shown at right).
2. (OPTIONAL) Display the desired list of jobs by filtering any of the following:
   a. Press **Client** then select a client option on the Select Client panel. The selected option appears on the Client button.
   b. Press **Farm** then select a farm option on the Select Farm panel. The selected option appears on the Farm button.
   c. Press **Field** then select a field option on the Select Field panel. The selected option appears on the Field button.
3. Press the up/down scroll buttons to move the list up or down until you see the desired job.
4. Press the desired job. The panels close and the template is created from the selected job.

Using a Job Template

Using a template starts a new job based on the job template you select. MAX supports two types of job templates:

- Templates you create from an existing job—see “Creating a Job Template” (previous section).
- Preplanned templates—these are templates created specifically for your field (usually by a third-party) that you then import into MAX. A preplanned template uses the data from your field and when loaded, displays all the guidelines for you (see “Preplanned Guidance” on page 154).

To use a job template:

1. Press **Menu > Jobs > Templates > Use Template**. The Use Template panel appears (shown at right).
2. (OPTIONAL) You can filter all templates by a specific client, farm, and/or field. Press a green button (Client, Farm, Field) then select an option on the “Select” panel that appears. The “Select” panel closes and the selected option appears on the button.
3. Press the up/down scroll buttons to move the list up or down until you see the desired template.
4. Press the desired template. The panels close, a “Loading template” message may appear briefly (if the file size of the template is large enough), and a new job is started based on the selected template.

Chapter 6: Maps

Mapping Options

Map Settings

MAX includes options and settings that enable you to customize your view as well as add imagery and markers to your map. This chapter describes working with maps using the two panels at right.

- You set mapping options using the Mapping Options panel (near right)—this section starts below.
- You configure map settings using the Map Settings panel (far right)—this section starts on page 125.

Mapping Options

Mapping options refer to how you display your vehicle and field, the map images you overlay on your field, markers (flags) you can set on your field, applied maps, and returning-to-point guidance.

You begin working with mapping options by displaying the Mapping Options panel (see right).

The Applied Color Map button only appears on the Mapping Options panel if you have optional rate control installed on your system and connected to MAX.

To display the Mapping Options panel, press the **Mapping Options** button on the map screen (see right).

Map Views, Perspectives, and Positions

Map views, map perspectives, and vehicle positions work together to provide you with different ways to view your vehicle and field. There are two map views (Vehicle and Field), two map perspectives (Top Down and 3D), and three vehicle positions (Low, Middle, and High). The map view determines whether the vehicle appears stationary and the map moves or vice versa. The map perspective refers to the angle at which you view the map. The vehicle position refers to vertical position of the vehicle on the touchscreen. Table 6-1 provides more information on map views, perspectives, and vehicle positions.

Table 6-1: Map views and perspectives

Map Option		Description
Map View	Vehicle	Use Vehicle view to “follow” the vehicle while work is in progress. In this view the map moves while the vehicle appears stationary on the screen. The vehicle is always pointing ‘up’ toward the top of the screen and the field adjusts.
	Field	In this view, the vehicle appears to move while the map appears stationary on the screen. You can pan to a specific area on the map by touching the screen and dragging the area into view. The field is oriented with North at the top of the screen and the vehicle points in its actual direction. For example, if the vehicle is driving southwest then it will point toward the bottom left of the screen.
Perspective	Top Down	Provides a bird’s eye view of the job.
	3D	Provides a three-dimensional view down the field in the direction of travel.
Vehicle Position	Low	Vehicle appears near bottom of screen.
	Middle	Vehicle appears in middle of screen.
	High	Vehicle appears near top of screen.

When first using MAX select different view/perspective combinations to become more familiar with how they appear on the screen. You should also review the following combinations:

- Correct: Vehicle:Top Down
- Correct: Vehicle:3D
- Correct: Field:Top Down
- Incorrect: Field:3D (If you are in Field:Top Down and you select 3D the Map View automatically changes to Vehicle. Also, If you are in Vehicle:3D and you select Field the Perspective automatically changes to Top Down).

Both Map Views display the vehicle's position on the field and direction of travel. The Zoom + and Zoom - buttons are available in both views as well. See “Zooming In and Out on the Map Screen” on page 13 for more information on zooming in and out on the screen.

The following examples illustrate different map/perspective combinations.

Vehicle / Top Down

Vehicle / 3D

Field / Top Down

The figures below show the different vehicle positions (low, middle, and high):

Low

Middle

High

To set the map view:

1. Press **Mapping Options**. The Mapping Options panel appears (shown at right).
2. Press **Map View** and select either **Vehicle** or **Field**.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

To set the map perspective:

1. Press **Mapping Options**. The Mapping Options panel appears (shown at right).
2. Press **Perspective** and select either **Top Down** or **3D**.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Map Layers

A map layer refers to a specific feature you can display on the map screen—available map layers are map imagery, prescription maps, and applied areas. You show or hide these features as well as adjust the opacity (transparency) of imagery and prescription maps via the Map Layers panel (shown at right).

Note: The Prescription and As Applied buttons only appear on the Map Layers panel if you have the optional rate and section control installed on your system and connected to MAX.

For more information on selecting and working with imagery, prescription maps, and applied areas:

- See “Map Imagery” on page 125 of this chapter for more information on map imagery
- See “Using Prescription Maps” on page 201 for more information on prescription maps
- See “Rate Control and Section Control Overview” on page 170 for more information on applied areas

The figures below provide an example of showing/hiding map imagery:

Hide imagery

Show imagery

To adjust map layer options:

1. Press **Mapping Options > Map Layers**. The Map Layers panel appears (see figure at top right of this page).
2. Press **Imagery**, **Prescription**, or **As Applied** to show/hide those options, where:
   - Check mark shows the feature
   - No check mark hides the feature

3. Press **Imagery Opacity** or **Prescription Opacity** to adjust the opacity (transparency) of imagery or prescription maps. An opacity window appears (Image Opacity window shown below).

4. Drag the slider or press the left or right arrows to set the opacity level then press **Close**. The selected setting appears on the Opacity button.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Event Markers

An event marker refers to any item you want to mark in a field, such as a pole, a rock, a tree or any other obstacle (tree marker shown at right). Markers appear as flags on the screen with the following identifiers:

- Color - by default each event marker type is a different color, such as green for a tree or blue for water
- Label - accompanying text that identifies the marker type, such as ‘rock’ or ‘ditch’

You can perform the following tasks using the Event Markers panel (shown at right).

- Edit a preset marker
- Drop a marker
- Delete a marker

To display the Event Markers panel, press **Mapping Options** (on the map screen) **> Event Markers**.

MAX includes preset markers for the following obstacles: Tree, Rock, Pole, Water, Ditch, and Obstacle. In addition to dropping markers you can edit the preset markers (label and/or color) to suit your needs.

Note: You must have an active job before you can drop a marker; however, you can edit preset markers without an active job.

Dropping a Marker

Dropping a marker refers to placing a marker in your preferred location.

To drop a marker:

1. Press **Mapping Options > Event Markers > Drop Preset Markers**. The Drop Preset Markers panel appears (see figure above right).
2. Press a marker. The marker appears as a flag on the map screen with an incremented text label and color of the marker.

   For example, if you drop a Pole marker (gold color) and this is the first marker you dropped then a gold 'Pole1' marker appears on the map screen at that point. If you then drop another Pole marker then that marker is named 'Pole2' (also gold).

3. Repeat step 2 as necessary as you are driving.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Editing a Preset Marker

You can change both the label (text) and color of a marker to change a marker or create a new marker. For example, if you rarely use the Ditch (gray) marker but have a need for a Fence marker, you can change the Ditch marker text to 'Fence.'

Keep in mind that editing a preset marker does not affect any markers you have already dropped.

To edit a marker:

1. Press **Mapping Options > Event Markers > Edit Preset Markers**. The Edit Preset Markers panel appears (top of panel shown at right).
2. To update the marker text:
   a. Press the text part of the marker button. The Enter Marker Label window appears.
   b. Enter a name then press **Done**.

3. To update the marker color:
   a. Press the color box on the right side of the marker button. The Select Marker window appears.
   b. Press a color.
4. Press **Save**.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Deleting a Marker from a Job

Caution: *Once you delete a marker from a job it is permanently removed from that job; you cannot retrieve a deleted marker.*

You can delete an individual marker (such as Pole2) from the current job. Deleting a marker does not change the numbering of other, higher-numbered markers and new markers will continue to increment from the last (highest) number used.

To delete a marker from a job:

1. Press **Mapping Options > Event Markers > Delete Marker**. The Delete Marker panel appears (shown at right) showing all the markers you have dropped.
2. Press the up/down scroll buttons to move the list up or down until you see the desired marker.
3. Press the marker you want to delete. The marker is deleted from the map screen and no longer appears on the Delete Marker panel.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Applied Color Maps

Note: The Applied Color Map button only appears on the Mapping Options panel if you have optional rate control installed on your system and connected to MAX.

When you use rate control through MAX the area to which you apply material (such as seed or fertilizer) is displayed as a specific color. This section describes how to change the rate and color for High Rate and Low Rate. For more detailed information on rate control see “Rate Control” on page 174.

To change the applied color:

1. Press **Mapping Options > Applied Color Maps**. The Applied Color Map panel appears (shown at right).

   The panel shows a rate and color for High Rate and Low Rate.

2. *To change a rate:*

   a. Press **High Rate** or **Low Rate**. The corresponding rate panel appears (High Rate example below).

   b. Enter a rate then press **Done**. The panel closes and the new rate appears on the rate button.

3. *To change a color:*

   a. Press the color (far right section) of the High Rate or Low Rate button. The Select Color window appears (shown below right).

   b. Press a color. The window closes and the new color appears on the rate button.

4. Press **Save**, then press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Map Settings

You work with maps in various ways in MAX. The Map Settings panel (shown at right) enables you to:

- Show A=B lines (parallel lines or grid pattern) or hide A=B lines
- Set grid spacing (for when A=B Lines is set to show a grid pattern)
- Edit preset markers
- Select, import, or delete background map imagery

Note: You can also edit preset markers from the Event Markers panel (press Mapping Options on the map screen).

To display the Map Settings panel, press **Menu > Settings > Map Settings**.

Setting A=B (Guidance) Line Display

An A=B line is the basic guidance line you follow with MAX; it provides a regular pattern over an area by which to guide. There are three A=B line display options available: Off, A=B, and Grid.

See “Straight Path Options” on page 131 for a more information on setting these options.

Map Imagery

Map imagery refers to a GPS satellite image you overlay onto your screen. For example, you may want to add an aerial photo of your farm and surrounding area.

You can perform the following map imagery functions via the Map Imagery panel (shown at right):

- Import map imagery
- Select map imagery
- Delete map imagery

To display the Map Imagery panel, press **Menu > Settings > Map Settings > Map Imagery**.

Importing Map Imagery

Before you can select map imagery to display on your screen you must first add it to MAX by importing it. You import map imagery using a USB drive (such as the one included in your MAX terminal kit).

Map imagery requires the following:

- Map imagery consist of two files (a map set): a map image file (.png file) and a configuration settings file (.ini file)
- Both files must reside in the same folder
- Each map set folder you want to import must reside in an 'imagery' folder that resides at the root level of the USB drive

Example: You have an 'image.png' file and an 'image.ini' file. These two files make up your map imagery set that you refer to as 'LowerWest.' To import this map imagery you would do the following:

1. Create an *imagery* folder on your USB drive.
2. Create a *LowerWest* folder in the 'imagery' folder.
3. Copy the *image.png* and *image.ini* files to the *LowerWest* folder.

To import map imagery:

1. Insert a USB drive (containing the appropriate map files) into the MAX terminal. See the previous section for information on adding map files to your USB drive.
2. Press **Menu > Settings > Map Settings > Map Imagery > Import Imagery**. The Import Map Imagery panel appears showing each map set on the USB drive (shown at right). Press the up/down scroll buttons to move the list up or down until you see the desired map set.
3. Press each map set you want to import (a check mark appears in the box of each selected map set) or press **Select All** to select all the map sets on the USB drive.
4. Press **Import**. An 'Importing Imagery' progress message appears (as shown below).

When the process is complete the map sets are added to MAX.

5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Selecting Map Imagery

Before you can select map imagery to add to your screen you must first import the appropriate map files (see the preceding section “Importing Map Imagery” for details).

To select map imagery:

1. Press **Menu > Settings > Map Settings > Map Imagery > Select Imagery**. The Select Map Imagery panel appears (shown at right).

2. Press the map set you want to display (map set refers to the two files that make up the set—the .png file and the .ini file). A ‘Preparing Imagery’ progress message appears (as shown below).

When the process is complete the selected map imagery button turns green and the map imagery appears onscreen.

3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Deleting Map Imagery

Caution: *Once you delete map imagery it is permanently removed from memory; you cannot retrieve deleted map imagery.*

To delete map imagery:

1. Press **Menu > Settings > Map Settings > Map Imagery > Delete Imagery**. The Delete Imagery panel appears.
2. Press each map set you want to delete (a check mark appears in the box next to each selected map set) or press **Select All** to select all the map sets.
3. Press **Delete**. The map set is deleted and is removed from the Delete Imagery panel.
4. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Chapter 7: Path Planning and Boundaries

Path Planning Basics
Setting Paths
Adjusting Paths
Contour Lock
Preplanned Guidance
Shuttle Shift and Re-engaging on a Line
eTurns
Setting Boundaries

This chapter provides information on path planning, which encompasses setting up your initial pass lines (such as straight A=B lines), driving along contours, and using eTurns to make automated turns.

Path Planning Basics

The path planning sections in this chapter provide alternate steps depending on whether you have automated steering (such as eDriveXC) installed. If no automated steering is installed you will manually perform steps that automated steering does for you.

If using automated steering, you cannot create any new guidance lines or recall previous guidance lines while engaged on a guideline. You must disengage steering before setting any new or previous guidance lines.

You cannot automatically engage any guideline. If you are already on a guideline, you can manually disengage the guideline by pressing the Steering button, or you can steer off of the guideline, at which point the automatic steering disengages. You then must manually press the Steering button to reengage the steering on a guideline.

You perform path planning tasks via the Path Planning panel (shown below). MAX supports the following guidance modes: Straight, Pivot, Contour, AB Contour, and Preplanned. You can switch to any guidance mode at any time as long as you are not engaged on a guideline. The guidance mode buttons are dimmed and not available while engaged on a guideline.

To display the Path Planning panel, press the **Path Planning** button on the map screen.

Setting Paths

Note: You must have an active job before using path planning; otherwise, the Path Planning button is disabled.

A path in MAX is a line you follow while driving your vehicle. MAX supports the following types of paths:

- Straight path
  - A=B line—an imaginary line that passes through two points that you set (Point A and Point B) to define the first pass
  - A + Direction line - where you define a beginning point (Point A) and enter a heading angle (the direction)
- Pivot (circular) path
- Contour (free-form) path
- AB Contour path

Straight Paths Overview

The following steps illustrate how you work with straight paths (Straight guidance mode) in MAX (depending on if you have automated steering installed).

Manual Steering	Automated Steering
1. Create straight line (A=B line or A + Direction line).	1. Create straight line (A=B line or A + Direction line).
2. MAX starts straight guidance.	2. MAX starts straight guidance.
3. Steer along guidance line using screen and lightbar.	3. Engage automated steering.
	4. MAX automatically steers you along guidance line.

Once an A=B line or A + Direction line is established MAX provides adjacent guidance lines so all other passes are perfectly spaced on both sides of the first pass.

When working with A=B lines you can also perform the following:

- Return to a previously recorded point
- Define a new A=B line
- Use a previously defined A=B line
- Use the previous A=B line

Straight Path Options

Before working with straight paths, verify the two straight path settings: A=B Lines and A=B Grid Spacing. There are three A=B Lines display options available: On, Grid, and Off (see Figure 7-1 next page). Grid lines are parallel guidance lines that are perpendicular to the A=B line (and its parallel guidance lines)—thus forming a grid. When Grid is selected the distance between the grid lines is based on the value set in the A=B Grid Spacing field (see “Setting the A=B Grid Spacing” on page 133 for more information).

A=B Lines = On (at left)
Guidance lines are displayed parallel to and on both sides of A=B line

A=B Lines = Grid (above)
Guidance lines are displayed parallel to and on both sides of A=B line <u>and</u> perpendicular grid lines are displayed with user-defined spacing

A=B Lines = Off (at left)
No guidance lines are displayed

Figure 7-1: A=B Lines: On, Grid, and Off

Setting the A=B Lines Option

This option allows you to display guidance lines, guidance lines with grid lines, or no guidance or grid lines for A=B lines and A + Direction lines.

1. Press **Menu > Settings > Map Settings**. The Map Settings panel appears (top of panel shown at right).
2. Press **A=B Lines** to cycle through the settings (On, Grid, Off) until you display the desired setting.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Setting the A=B Grid Spacing

This option allows you to set the distance between the grid lines on the map for A=B lines and A + Direction lines.

1. Press **Menu > Settings > Map Settings**. The Map Settings panel appears.
2. Press **A=B Grid Spacing**. The A=B Grid Spacing panel appears (shown at right).

   If you set your system to display U.S. units then there are two data entry fields: one for feet and one for inches.

   If you set your system to display metric units then there is only one data entry field for meters.
3. *For U.S. units:* The feet field is selected by default. Enter a value for feet, press the inches field, then enter a value for inches.

   For Metric units: Enter a value for meters.
4. Press **Done**. The new value appears on the A=B Grid Spacing button.
5. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Setting Straight Paths

This section describes how to:

- Set an A=B line
- Set an A + Direction line
- Return to a previously recorded point
- Define a new A=B line
- Use a previously defined A=B line
- Use the previous (most recent) A=B line

Setting an A=B Line

When you set an A=B line, MAX:

- Labels both the A and B points on the screen as you set them (the A and B points are recorded at the implement position as shown on the map)
- Names the line as A=Bx, where x is a number. The first straight path (A=B line or A+ Direction line) you create in a job is A=B1, the second is A=B2, and so forth. This name appears in the Current Path field on the Path Planning panel.

You can also rename an A=B line—see “Renaming a Path” on page 151.

To set an A=B line:

1. Position the vehicle at the beginning of the first pass.
2. Press **Path Planning > Straight > A=B**. The A=B panel appears (top of panel shown at right).

3. Start driving the first pass, wait until the implement on the map trails straight, then press **Point A**. If this is the first straight path for this job, 'A=B1 A' appears on the map (shown below) at the location of the vehicle. The Point A button is dimmed and the Point B button is active.
4. At the end of the pass, press **Point B** (on the A=B panel) to mark Point B. The panels close, A=B1 B appears on the map (shown below) at the point where you pressed Point B, and swath lines appear on the map.

eDriveX installed: Press the Steering button to engage automated steering. MAX steers your vehicle along the A=B line. The Steering button must be in a state of 'ready to engage' (shown below) before you press it to engage automated steering.

No automated steering installed: Drive the first pass using the lightbar (onscreen or external) to help you drive along the guideline.

5. At the end of the current pass turn around and steer your vehicle to the next guideline.

   eDriveX installed: Press the Steering button to engage steering. MAX automatically steers your vehicle along the A=B line.

   No automated steering installed: Drive the pass using the lightbar (onscreen or external) to help you drive along the guidance line.

Note: If you are using eTurns to have MAX automatically turn your vehicle for you and start the next pass, see "eTurns" on page 156.

Setting an A + Direction Line

When you set an A + Direction line, MAX:

- Labels the A point on the screen as you set it (the A point is recorded at the implement position as shown on the map)
- Names the line as A=Bx, where x is a number. The first straight path (A=B line or A + Direction line) you create in a job is A=B1, the second is A=B2, and so forth. This name appears in the Current Path field on the Path Planning panel.

You can also rename an A + Direction line—see “Renaming a Path” on page 151.

To set an A + Direction line:

1. Position the vehicle at the beginning of the first pass.
2. Press **Path Planning > Straight > A + Direction**. The A + Direction panel appears (top of panel at right).

3. Press **Point A**. If this is the first straight path for this job, A=B1 A appears on the map at the location of the vehicle and the Enter Path Direction data entry window appears (at right).
4. Enter an angle then press **Done**. The A + Direction guideline is applied and appears on the map.

5. *eDriveX installed:* Press the Steering button to engage automated steering. MAX steers your vehicle onto then along the A + Direction line. The Steering button must be in a state of ‘ready to engage’ (shown at right) before you press it to engage automated steering.

No automated steering installed: Drive the first pass using the lightbar (onscreen or external) to help you drive along the guideline.

6. At the end of the current pass turn around and steer your vehicle to the next guideline.

   eDriveX installed: Press the Steering button to engage steering. MAX automatically steers your vehicle onto then along the A + Direction line.

   No automated steering installed: Drive the pass using the lightbar (onscreen or external) to help you drive along the guideline.

Note: If you are using eTurns to have MAX automatically turn your vehicle for you and start the next pass see "eTurns" on page 156.

Returning to a Point

MAX can provide guidance to an existing point—the Last Apply point, any A or B point, or any dropped marker in the current job. Keep in mind that this feature does not automatically take you to this point—it only provides guidance to this point in the form of the distance to the point and the bearing.

To return to a point:

1. Press **Mapping Options > Return To Point**. The Return To Point panel appears (shown at right).
2. Press the up/down scroll buttons to move the list up or down until you see the desired point.
3. Press the point. The panels close and a Return To Point window appears showing the distance to the point and the bearing (below left). As you get closer to the return point the distance and bearing reflect this (below right).

4. Press **Stop Guidance** to stop guidance to the point.

Defining a New A=B Line

You can set a new A=B line at any point during the job. When you define a new A=B line the number following the B is incremented as follows:

- First A=B line: A=B1 A and A=B1 B
- Second A=B line: A=B2 A and A=B2 B
- Third A=B line: A=B3 A and A=B3 B, and so forth

See “Setting an A=B Line” on page 133 for more information on setting an A=B line.

To define a new A=B line:

1. Press **Path Planning > Straight > A=B**. The A=B panel appears (shown at right).
2. Press **Point A**. If this is the second straight path for this job, ‘A=B2 A’ appears on the map at the location of the vehicle. The Point A button is dimmed and Point B button is active.
3. Drive the first pass.
4. At the end of the pass, press **Point B** to mark Point B. A=B2 B appears on the map at the point where you press Point B and swath lines appear on the map.

Using a Previously Defined A=B Line

MAX stores all straight paths you create. If necessary, you can use a previously defined A=B line for guidance.

To use a previously defined A=B line:

1. Press **Path Planning > Previous Paths**. The Select a Previous Path panel appears (top of panel shown at right).
2. Press the desired previous path button. The selected path is set as the guidance line.
3. Press **Back/Close** repeatedly or press the Close arrow to return to the map.

Using the Previous A=B Line

MAX stores all straight paths you create. If necessary, you can use the previous (most recent) defined A=B line for guidance.

To use the previous A=B line:

1. Press **Path Planning > Straight > Last A=B**. The previous A=B line is set as the guidance line and the name of the A=B line appears in the Current Path field on the Path Planning panel. For example, if the previous A=B line is A=B1, the Current Path field shows the value at right.
2. Press **Back/Close** repeatedly or press the Close arrow to return to the map.

Pivot Paths

Pivot guidance is similar to straight guidance except that you define the circumference of a circle rather than a straight line with A and B points. To do so, drive as much of the circumference of a representative circle as possible. The more of the circumference you drive, the better the accuracy.

Note: A job must be active for you to set paths; otherwise, the Path Planning button on the map screen is dimmed (unavailable).

To set a pivot path:

1. Position the vehicle at the beginning of the first pass.
2. Press **Path Planning > Pivot**. The Pivot panel appears (left panel at top of next page).
3. Press **Start Pivot** and begin driving the circle. “Logging pivot data...” appears below the Start Pivot button (center panel at top of next page). When MAX has collected enough data to calculate the circumference of the circle being driven

"Pivot OK" appears below the Start Pivot button and the Finish Pivot button is active (right panel below).

4. At the end of the circle press **Finish Pivot** to end the pivot log. The panels close and the pivot line (circle) appears on the map.

When traveling on or near a pivot guideline, the nearest guideline is shown on the map as a red circular line (similar to the guideline used in other guidance modes).

Automated steering installed: MAX automatically begins pivot guidance and, after you press the Steering button on the map screen to engage steering, steers your vehicle along the pivot line. The Steering button must be in a state of 'ready to engage' (shown at right) before you press it to engage automated steering.

No automated steering installed: Turn the steering wheel in the direction indicated by the pivot line to remain centered on the pivot line and drive the first circle using the lightbar (onscreen or external) to help you drive along the guidance line.

5. When you have finished one circle move to either the right or left of the original circle and steer your vehicle to the next guidance line.

Automated steering installed: Press the Steering button to engage steering. MAX automatically steers your vehicle along the circle.

No automated steering installed: Drive the circle using the lightbar (onscreen or external) to help you drive along the guidance line.

Contour Paths

Use Contour guidance mode to follow any previous applied paths/area (straight, pivot, or free form). Contour mode differs from Straight and Pivot guidance modes: Straight and Pivot guidance modes follow predefined guidelines while Contour guidance mode follows previously defined paths.

In Contour guidance mode MAX is either logging an initial pass or guiding from a previous pass. You generally use Contour guidance mode for working with borders, turn areas, and following the contours created by obstacles. Contour guidance provides a guidance line along any previously applied path. You must steer your vehicle within an implement's width of the guidance line, at which point the Steering button becomes enabled (ready to engage). You can then press the Steering button and MAX engages on the guidance line.

To use Contour guidance mode:

1. Press **Path Planning > Contour**. The panels close and Contour guidance mode is enabled.
2. Press **Apply** (set it to On) then make your initial pass.

3. Press **Apply** (set it to Off) then turn around to follow the previous pass. As you get near the original pass, a red line appears indicating the guideline you are to follow, and the lightbar and Cross Track error indicator both indicate the direction you need to turn to follow the path.

Guiding on Subsequent Passes

Any time your vehicle is within a half swath width of a previously logged pass, and the angle of Attack is within limits, you can engage MAX automated steering. See “Steering Attack” on page 64 for more information on steering attack.

Making a New First Pass

Occasionally a situation arises in the middle of a job when you need to make a pass that follows a different path than the previous passes. Simply drive the new path. Once it becomes obvious that you are defining a new pass, MAX goes into logging pass mode. Subsequent passes are guided from this newly defined pass.

Changing Guidance Modes

If you want to switch from Contour guidance mode to either Straight guidance mode or Pivot guidance mode:

- Press **Path Planning > Straight > Last A=B** to switch to Straight guidance mode.
- Press **Path Planning > Pivot > Last Pivot** to switch to Pivot guidance mode.

AB Contour Paths

Note: AB contour paths is an eDriveX-only feature—you must have eDriveX installed on your system for AB contour path functionality to be available.

AB contour path functionality allows you to create a reference guideline along a contour path. For example, if your field requires a curved path around an obstacle, you can create an AB contour to for the initial passes and then create another AB contour to drive around an obstacle. The second AB contour can be in one of two forms:

- A merged AB contour where MAX combines your original AB contour (before your detour), your detour, and the continuation of the original AB contour (where you merge back onto the original contour (top figure next page)
- A new AB contour where MAX combines your original AB contour (before your detour) and your detour (bottom figure next page)

Part of new AB contour based on original AB contour (after you merge onto original AB contour)
Detour AB contour
Obstacle
Original and New (Merged) AB Contour
Part of new AB contour based on original AB contour
New AB (End) contour path
Original AB contour path

Post-obstacle (manual) steering
Newly defined contour
Obstacle
Original and New (End) AB Contour
Part of new AB contour based on original AB contour
New AB (End) contour path
Original AB contour path

To start an AB contour path:

1. Position the vehicle at the beginning of the pass.
2. Press **Path Planning > New AB Contour**. The New AB Contour panel appears (top of panel shown at right).

3. Press **Start Contour**. The Start Contour is gray and, after you drive for a short distance, a blue line guideline appears within the AB contour path, and the End Contour becomes available.

4. When finished driving your AB contour, press **End Contour**. Red guidelines extend from both ends of the AB contour path to provide guidance.

5. Turn around and steer your vehicle to the next guidance line. As you get closer to the guidance line the Steering button changes to ‘ready to engage’...press the Steering button to engage on the AB contour.
6. At the end of each pass repeat step 5.

> *Note: You can press Cancel Contour at any time before pressing End Contour to cancel the AB contour. This prevents the AB contour from appearing as a previous path on the Select a Previous Path panel (see "To drive any previous AB contour path" below).*

To drive the previously driven AB contour path:

1. Position the vehicle at the beginning of the pass.
2. Press **Path Planning > Last AB Contour**.

To drive any previous AB contour path:

1. Position the vehicle at the beginning of the pass.
2. Press **Path Planning > Previous Paths**. The Select a Previous Path panel appears (shown at right). Any AB contour paths are listed as AB Contour 1, AB Contour 2, AB Contour 3, etc.
3. Select the desired AB contour. The selected AB contour is applied to the map screen.

Adjusting Paths

You can adjust a straight guidance path (A=B line or A + Direction line), a pivot path, and an AB contour path. While receiving guidance in either of these modes you can adjust the guidance line on-the-go (without interrupting normal guidance operation). This feature is especially useful to correct for DGPS drift over time. You adjust paths using the Path Adjustment panel (shown at right).

To display the Path Adjustment panel:

- Press **Path Planning > Path Adjustment**

The following text provides an overview of each path adjustment function on the Path Adjustment panel.

- **Path Offset**
  Move the guidance line up to 1/2 implement width relative to the original guideline.
- **Snap Here**
  Move (snap) the guidance line to the vehicle's current location parallel to the original guidance line. This feature is best used to insert a required gap between consecutive parallel swaths (for example, a conservation barrier strip). The amount of the snap from the original guideline is displayed in the Path Offset amount. For example, if you steer off the guideline by 3 ft 6 in and press Snap Here, the Path Offset displays 3 ft 6 in. Setting the Path Offset back to zero returns you to the original guideline.
- **Shift**
  Move the guidance line left or right (up to 1/2 implement width relative to the previous shift) in small increments rather than re-establishing a new guidance line. The sum of all shifts is displayed in the Path Offset amount. For example, three shifts of 2 ft to the right are displayed as a Path Offset of 6 ft to the right. Setting the Path Offset back to zero returns you to the original guideline.
- **Update B**
  If you need to correct Point B in an A=B line, you can adjust the A=B line by pressing the Update B button on the initial pass.
- **Detour Contour**
  When driving along an AB contour you can create a detour path around the obstacle. You then decide whether to end your path after steering around the obstacle or merge into the original AB contour after driving around the obstacle—in both instances you have created a new AB contour that combines the original AB contour and the detour.
- **Rename Path**
  Rename a straight (A=B or A+ Direction) or AB Contour path.

Note: The Path Adjustment panel is the only place where you can adjust the guidelines and maintain engaged steering. Any other guideline change requires disengaging the steering. All path adjustments are removed when you close a job and the original guidelines are restored when you continue the job.

Entering a Path (Guidance Line) Offset

While in either Straight guidance mode or Pivot guidance mode you can enter a path offset to move a guidance line by any amount.

To enter a path offset:

1. Press **Path Planning > Path Adjustment > Path Offset**. The Path Offset panel appears (shown at right).
2. Set the offset amount and direction:
   a. Under *Enter offset amount* press the appropriate distance field (ft and/or in for U.S. units; m for metric units) then use the keypad to enter a value.
   b. Under *Choose offset direction* press either the left arrow or the right arrow to shift (nudge) the guidance line left or right relative to the direction of travel.
3. Press **Done**. The Path Offset panel closes and the guidance line shifts on the map by the selected amount and direction.

> *Note: If you enter a path offset outside the allowable range (between zero and half the current implement width) and then press Done an error message appears; press **Ok** to close the message and then use an offset within the allowable range.*

The figures below show a vehicle before entering a path offset (left figure below) and after entering a path offset (right figure below) to the right (pressing the right arrow button) by the amount in the Path Offset panel.

4. Press **Back/Close** repeatedly or press the Close arrow to return to the map.

Snapping a Guidance Line to the Current Location

While in either Straight guidance mode or Pivot guidance mode you can 'snap' the guidance line to the vehicle's current location parallel to the original guidance line.

To snap a guidance line to the current location:

1. Press **Path Planning > Path Adjustment**. The Path Adjustment panel appears (top of panel shown at right).

2. Press **Snap Here**. The panels close and the nearest guideline is aligned with the current vehicle position. The figures below show a vehicle before snapping a guidance line (left) and after snapping a guidance line (right) to the vehicle's current position.

Shifting a Guidance Line

While in either Straight guidance mode or Pivot guidance mode you can use the shift function to have MAX move the guideline position by the designated distance and the current pass number.

To shift a guidance line:

1. Press **Path Planning > Path Adjustment > Shift**. The Shift panel appears (shown at right).
2. Set the shift amount and direction:
   a. Under *Enter Shift increment* press the appropriate distance field (ft and/or in for U.S. units; m for metric units) then use the keypad to enter a value.
   b. Under *Shift Left or Right* press either the left arrow or the right arrow to shift (nudge) the guidance line left or right relative to the direction of travel.

As soon as you press an arrow button the guidance line shifts on the map by the selected amount and direction and the panels close.

The figures below show a vehicle before shifting the guidance line (below left) and after shifting the guidance line (below right) to the right (pressing the Shift Right arrow) by the amount in the Shift panel.

Updating Point B

While in either Straight guidance mode or Pivot guidance mode use the following steps to use your current location as the new Point B. You can only update B within a half swath width of the original A=B line. Once your vehicle moves more than 1/2 swath width from the primary guideline and the primary guideline shifts right or left, the Update B button is no longer available (dimmed).

To update Point B:

1. Press **Path Planning > Path Adjustment > Update B**. MAX sets your current location as the new Point B.
2. Press **Back/Close** repeatedly or press the Close arrow to return to the map.

Detour AB Contour

When driving along an AB contour you may need to steer around an obstacle (such as a tree line or water area). You can adjust your AB contour path by creating a detour path around the obstacle. You then decide whether to end your path after steering around the obstacle or merge into the original AB contour after driving around the obstacle—in both instances you have created a new AB contour that combines the original AB contour and the detour as follows:

- A merged AB contour is where MAX combines your original AB contour (before your detour), your detour, and the continuation of the original AB contour (where you merge back onto the original contour (left figure below)
- A new (End) AB contour is where MAX combines your original AB contour (before your detour) and your detour (right figure below).

Part of new AB contour based on original AB contour (after you merge onto original AB contour)
Detour AB contour
Obstacle
Original and New (Merged) AB Contour
Part of new AB contour based on original AB contour
New AB (End) contour path
Original AB contour path

Post-obstacle (manual) steering
Newly defined contour
Obstacle
Original and New (End) AB Contour
Part of new AB contour based on original AB contour
New AB (End) contour path
Original AB contour path

To create a detour:

1. While driving along an AB contour and approaching an obstacle, press **Path Planning > Path Adjustment > Detour Contour**. The Detour AB Contour panel appears (top of panel shown at right).

2. Press **Start Detour** (this disengages autosteering) and drive off the AB contour to avoid the obstacle. The Start Detour button is unavailable and the End Detour button is available.

3. After you pass the obstacle you can do one of the following:
   - Press **End Detour** to create a new AB contour
   - Drive toward the original AB contour, engage autosteering, wait for the Merge Contour button to become available, and press **Merge Contour** to create new merged AB contour (example shown below)

Renaming a Path

MAX enables you to rename a straight path (A=B or A+ Direction) or an AB Contour path. For example, if you have three A=B paths named A=B1, A=B2, and A=B3 you can use more descriptive names such as Barn Side, Hill, and Valley. You can only rename the current path. If you want to rename a different path, make that path the current path.

Note: The following procedure assumes you just created an A=B line (A=B1) and it is the current path.

To rename a path:

1. Press **Path Planning**. The Path Planning panel appears with the current path name shown in the Current Path box (A=B1 in this example).

2. Press **Path Adjustment**. The Path Adjustment panel appears (top of panel shown at right).

3. Press **Rename Path**. The Enter Rename path window appears displaying the current path name (A=B1).

4. Type the new path name (for example, ‘Hill side’) then press **Done**. The window closes, you are returned to the Path Adjustment panel, and the map

screen shows the new path name (for the A=B line in this example both points have the new name ‘Hill side A’ and ‘Hill side B’).

Contour Lock

When using Contour guidance MAX constantly searches for the nearest swath from which to provide guidance. Contour Lock™ enables you to stop MAX's search for the closest swath. In Contour Lock mode, guidance:

- Remains locked on its current swath until you manually unlock it
- Automatically unlocks if you drive offline by 2 m (or 10% of the swath width) and begins searching for the closest swath again

Figure 7-2: Contour Lock mode

Contour Lock is helpful when you use guidance in close proximity to multiple swaths, such as when working with "point-rows." In these situations without Contour Lock, guidance could jump around and guide you on the wrong path whenever other swaths come close to your current one. With Contour Lock, you can decide if you want to stay on the current swath all the way until the end of the field or let MAX continue searching for the closest swath.

Note: When not in Contour Lock mode and when searching for the closest path, MAX only picks up a different path if it is at a small angle to the path you are on. For example, if you cross a path at right angles, MAX will not 'find' the crossed path and switch guidance to it. Only paths at a small angle (close to parallel) to the path you are on may be selected.

To use Contour Lock:

1. In Contour guidance mode when on or approaching the required guidance contour press the blue (unlocked) Contour Lock button.

   This puts you in Contour Lock mode (lock engaged) and the Contour Lock button shows a locked padlock. MAX stops

searching for, and providing guidance on, passes for other defined contours (no matter how close).

If you move more than 2 m off the current guidance line, Contour Lock, while still engaged, becomes inactive and the padlock appears unlocked. MAX resumes its contour search and locks again when you are within 2 m of any guidance line.

2. To deactivate Contour Lock, press the green Contour Lock button—Contour Lock can be active (padlock locked) or inactive (padlock unlocked) when you disengage it.

   or

   The button turns blue with the padlock unlocked.

Preplanned Guidance

Note: Preplanned guidance is a subscription-only eDriveX feature—you must have eDriveX installed on your system and have a valid subscription to use preplanned guidance. Contact your local dealer or Outback Guidance Customer Service to obtain a preplanned guidance subscription.

Preplanned guidance enables you to use externally created job template with guidelines to efficiently work your field. Typically, a third-party company will create the template and you import the template just as you would any other job or job template. See “Importing a Job” on page 109 for information on importing jobs and job templates.

When creating your preplanned templates, use a name you will recognize to easily identify them in the Use Templates list (there may be other non-preplanned templates in the list). Consider prefacing each preplanned template with something like “PP_” or “Pre_” or “Plan_”. For example, you may name a preplanned template for Farm1 as “Pre_Farm1”.

To use preplanned guidance:

1. Press **Menu > Jobs > Templates > Use Template**. The Use Template panel appears (shown at right).
2. Select the preplanned template you want to use (PrePlanned or 50_Contours shown at right). See “Using a Job Template” on page 114 for more information on selecting a job template.

   After you select the template the panel closes, a “Loading Template” message appears briefly, and a new job is started.

3. On the map screen press **Path Planning**. The Path Planning panel appears (at right).
4. Press **Preplanned**. The panel closes and the template appears on the map. The example below shows a boundary (blue), guidelines (gray/brown), and nearest guideline (red). When a guideline is red you can engage on that line using autosteering (provided all engage conditions are met).

5. Press the Steering button to engage automated steering. MAX steers your vehicle onto then along the guideline. The Steering button must be in a state of 'ready to engage' (at right) before you press it to engage automated steering.

6. At the end of the current pass turn around and steer your vehicle to the next guideline. Then press the Steering button to engage steering MAX automatically steers your vehicle onto then along the guideline. Repeat this step as needed.

Shuttle Shift and Re-engaging on a Line

For vehicles with shuttle shift functionality, you can shift between forward and reverse gears without using the clutch, enabling you to shift direction more quickly and easily. If you are engaged on an A=B line, pivot line, or contour line, you can automatically re-engage on your guidance line when switching from forward to reverse and vice versa.

An example of using shuttle shift is to line up in a headland when turning around.

The following scenario shows how shuttle shift works.

1. While engaged on a line, slow down and come to a stop. As you come to a stop MAX disengages autosteering (the Steering button starts flashing between 'engaged' and 'ready to engage' states).

   You have approximately five seconds to automatically re-engage autosteering (by driving forward or in reverse); this is when the Steering button is flashing.

2. Start driving in reverse. The Steering button briefly flashes then MAX automatically re-engages on the line (Steering button turns solid green).
3. When you are ready to go in a forward direction again, slow down and come to a stop. As you come to a stop MAX disengages autosteering (the Steering button starts flashing between 'engaged' and 'ready to engage' states).
4. Start driving forward. The Steering button briefly flashes then MAX automatically re-engages on the line (Steering button turns solid green).

eTurns

Note: eTurns is a subscription-only eDriveX feature—you must have eDriveX installed on your system and have a valid eTurns subscription to use eTurns. Contact your local dealer or Outback Guidance Customer Service to obtain an eTurns subscription.To enter your eTurns authorization code see "Viewing and Entering Subscription Information" on page 23. If you do not have a valid eTurns subscription and you press the eTurns button the following message appears.

eTurns enables the vehicle to automatically execute a turn at the end of a swath (you determine which swath to turn onto).

The key points about eTurns are:

- eTurns are applicable only to A=B operations (A=B, A + Direction, and AB Contour paths)
- The eTurns button (bottom right of screen) is not active until you have calibrated eTurns
- eTurns calibration is required for each implement
- You can operate with a fixed turn configuration or change the configuration in real time for individual turns
- eTurns guides the vehicle turning path, not the implement's turning path
- The headland prompt, if used, is based on the vehicle position, not the implement's position

Note: Outback recommends you calibrate your autosteering system before you calibrate eTurns (see "Vehicle Calibration Considerations" on page 59). Also, eTurns calibration is required for each implement (unless implements are identical - see Warning in the next section).

Calibrating eTurns

WARNING: *Due to potential for damage to machinery if using a larger implement with the calibration data recorded for a smaller implement, you need to recalibrate eTurns for different implements. When making the left and right turns during eTurns calibration, make the minimum radius turns possible for the current implement.*

To calibrate eTurns:

1. Create or load the desired vehicle and implement (see “Working with Vehicles” on page 66 and “Working with Implements” on page 75 for information).
2. Press **Menu > Implement Profiles**. The Edit Implement Profile panel appears (shown at right).

> *Note: You can also calibrate eTurns while in the process of creating an implement—in this case you will still be on the New Implement Profile screen.*

3. Press **Calibration**. The Implement Calibration panel appears (top of panel shown below).

4. Press **eTurns**. The first eTurns Calibration panel (Step 1 of 5) appears.

   For this step and subsequent steps refer to the panels below.

5. Maintaining the recommended speed, steer to the left at the minimum radius for the current implement (tightest possible or practical turn for the current implement) then press **Next**. The next panel (Step 2 of 5) appears, indicating calibration is in progress. When calibration is complete the next calibration step screen (Step 3 of 5) appears.
6. Maintaining the recommended speed, steer to the right at the minimum radius for the current implement (tightest possible or practical turn for the current implement) then press **Next**. The next panel (Step 4 of 5) appears, indicating calibration is in progress. When calibration is complete the final calibration step screen (Step 5 of 5) appears, displaying the minimum turning circles of the vehicle on left and right lock.
7. Press **Done**. The panel closes and you are returned to the Edit Implement Profile panel.
8. Press **Back/Close** repeatedly or press the Close arrow to return to the map.

Configuring and Making eTurns

After you have completed eTurns calibration you can configure eTurns using the eTurns Setup panel (shown at right).

You can change any of these settings in real time to manage turns individually or leave them as is for each eTurn.

Note: You must be engaged on an A=B line before using eTurns. If you press the eTurns buttons while not engaged on an A=B line the message below appears.

Table 7-1 describes each of the eTurns setup parameters.

Table 7-1: eTurns setup parameters

Parameter	Description
Max Speed	Speed at which you want your vehicle to execute the eTurn. The Speed and the Headland Distance combine to determine the linear distance from the headland that the prompt appears. If, during an eTurn, you exceed the speed you set (here or on the eTurns Control panel), automated steering (so the eTurn also) will disengage.

Table 7-1: eTurns setup parameters *(continued)*

Parameter	Description
Next Pass	Order in which rows are worked (or 'steered to' - also known as the 'swath pattern'). Pressing the up arrow or down arrow displays the following options: • Current Pass - automatically turn back onto the current row • Next Pass - automatically turn onto the adjacent row • Skip Rows: # - skip the number of adjacent rows specified (for example, for Skip Rows: 1, the vehicle will automatically turn on the pattern 1, 3, 5, 7 etc.)
Turn Direction	Direction to turn (left or right)
Place Turn	Set to Under Vehicle, On Headland, or Inside Boundary to generate eTurns as follows: • Under Vehicle - MAX starts the eTurn in front of the vehicle. • On Headland - MAX starts the eTurn when the vehicle enters the headland and the vehicle is able to drive outside a boundary. While performing this type of eTurn, eDriveX will disengage autosteering if the vehicle speed exceeds the Max Speed value noted near the top of the eTurns Setup panel. *Example:* The figure below shows a right boundary (blue line on outside edge of swath). Place Turn is set to On Headland. The predicted eTurn (blue vehicle path) will turn the vehicle when the vehicle enters the headland (Point A in the figure below).

Table 7-1: eTurns setup parameters *(continued)*

Parameter	Description
Place Turn *(continued - Inside Boundary)*	• Inside Boundary - MAX starts the eTurn so that the turn is inside the boundary—you must have a boundary in place for this feature to work. While performing this type of eTurn, eDriveX will disengage autosteering if the vehicle speed exceeds the Max Speed value noted near the top of the eTurns Setup panel. *Example:* The figure below shows a right boundary (blue line on outside edge of swath). Place Turn is set to Inside Boundary. The predicted eTurn (blue vehicle path) will turn the vehicle so the right edge of the implement will be just inside the blue boundary line.

Table 7-1: eTurns setup parameters *(continued)*

Parameter	Description
Headland Prompt Time	When set to a non-zero value, (check mark appears in box) the headland prompt appears on the map screen during operations. MAX will show the predicted eTurn based on what you select from the Place Turn drop-down. When you approach a headland at less than 45° (below) MAX will not automatically display the eTurns Control panel—you must press the eTurns button on the map screen. The eTurn is generated in front of the vehicle—press GO at the point you want to perform the eTurn.
Skip Setup	Skips the eTurns Setup panel when making eTurns and displays the eTurns Control panel.

See “eTurns Settings and Resulting Actions” on page 165 for information on how the Headland Distance and Skip Setup settings determine what appears onscreen when making eTurns.

To configure and make eTurns:

1. When eDriveX is ready to engage press the Steering button. The Steering button turns from blue to green and the eTurns button turns from gray to blue (at right).

Steering eTurns

2. Press the eTurns button. The eTurns Setup panel appears, the eTurn path appears on the map, and the eTurn direction on the map corresponds to green/selected Turn Direction arrow.

3. Make your selections:
   a. Press the **Max Speed** arrows to decrease (down arrow) or increase (up arrow) the maximum speed.
   b. Press the middle arrows (labeled 'Next Pass' by default) to decrease (down arrow) or increase (up arrow) the number of passes to skip. As you press the buttons the eTurn path on the map changes and 'Next Pass' changes to 'Skip Passes' (followed by the number of times you press either button that corresponds to how many passes to skip).

      The left figure below shows skipping one pass to the left (after pressing the up arrow); the right figure below shows skipping two passes to the left (after pressing the up arrow again). To return to skipping no passes and turning onto the next pass, press the down arrow twice.

   c. Press the **Turn Direction** arrows to make your eTurn to the left or to the right. As you press the button the eTurn path changes to either side of the of the current swath.
   d. Press **Headland Prompt Time**, enter a time, then press **Done**.
   e. Press **Skip Setup** so the next time you press the eTurns button on the map screen MAX skips (does not display) the eTurns Setup panel and displays the eTurns Control panel.

4. Press **Ok**. The eTurns Control panel appears.

> *Note: You can also press Back to keep your settings but complete an eTurn at a later time.*

Predicted Turns and Actual Turns

You use the eTurns Control panel (top of panel shown at right) to initiate an eTurn. You display this panel in two ways:

- Pressing Ok on the eTurns Setup panel
- Pressing the eTurns button in the lower right corner of the map screen (only if you previously selected Skip Setup on the eTurns Setup panel)

As shown below, a predicted eTurn is what you see on the map screen during setup before you make the eTurn and the eTurn path is blue. When you make the eTurn (pressing Go on the eTurns Control panel), the panels close, the screen shows the eTurn path in red, and the eTurn begins.

Predicted turn (blue)

Actual turn (red)

eTurns and Speed

The predicted and actual turn eTurn paths are determined by the speed at which you set the eTurn to be made (and the curvature calibration for the tractor/implement combination). The figures at right show how the speed determines the eTurn path.

If you exceed the set speed during the eTurn (beyond a small buffer value), automated steering disengages. This applies to the speed you set on the eTurns Setup panel or the speed you set (override) in the eTurns Control panel.

Slow eTurn speed

Fast eTurn speed

eTurns Settings and Resulting Actions

Exactly how you activate an eTurn depends on how you set up eTurns. Table 7-2 details the actions you take for each configuration. In all cases, the predicted eTurn path (green) is shown until you press Go in the eTurns Control panel. The predicted eTurn path travels with you until you press Go.

Table 7-2: eTurns configuration settings and resulting actions

eTurns Settings	Result
Skip Setup selected Headland Prompt Time not set (zero)	1. On the map screen press the eTurns button. 2. On the eTurns Control panel press **Go**.
Skip Setup selected Headland Prompt Time set (non-zero)	1. On the eTurns Control panel press **Go**. 2. On subsequent passes the eTurns Control panel will automatically appear based on the Headland Prompt Time setting.
Skip Setup Not Selected Headland Prompt Time not set (zero)	1. On the map screen press the eTurns button. 2. On the eTurns Setup panel adjust the setup parameters then press **Ok**. 3. On the eTurns Control panel press **Go**.
Skip Setup Not Selected Headland Prompt Time set (non-zero)	1. Adjust the setup parameters on the eTurns Setup panel and press **Ok**. 2. On the eTurns Control panel press **Go**. 3. On subsequent passes the eTurns Control panel will automatically appear based on the Headland Prompt Time setting.

*Note: If you are in Skip Setup mode (previously selected Skip Setup on the eTurns Setup panel) and want to adjust your eTurns configuration settings press **Menu > Settings> eTurns Setup**, or, if you are currently on the eTurns Control panel press **eTurns Setup**.*

Setting Boundaries

Normally, you complete the first operational pass to set and record the boundary of the field. The Boundary feature enables you to record field perimeters and save them as templates for future operations—allowing boundary information to remain consistent from job to job, season after season.

You can include multiple boundaries in a single job. When a field is divided into multiple areas, MAX adds the areas defined by the boundaries to calculate the total job area.

You can also exclude boundaries. For example, if there is an obstacle in the field, such as a body of water, you may want to excluded it from the total area calculation. Use the same boundary function, except select Exclude—the resulting excluded area is deducted from the total job area calculation.

To set a boundary:

1. Drive to the starting position of the field.
2. Press **Menu > Boundaries**. The Field Boundary panel appears (shown at right).
3. Press the upper drop-down (green field, showing Center in the figure at right) and select **Left**, **Center**, or **Right** to determine if the calculations should start from the left edge, center, or right edge of the swath width.
4. Press the lower drop-down (green field, showing Include in the figure at right) and select:
   - **Include** to get the total area calculation
   - **Exclude** to subtract the defined area from the total area calculation
5. Press **Start Boundary**. The Start Boundary button dims (unavailable) and the Finish Boundary button is available.

> *Note: You can perform actual work while creating the boundary (Apply On) or drive around the field with Apply Off. The boundary is created from the edge or center of the current Implement swath, regardless of whether Apply is On or Off.*

6. Drive around the outside of the field as accurately as possible. A solid black line indicates a boundary in progress.

The example below shows a Right Include boundary in progress (top two buttons on Field Boundary panel).

The boundary automatically closes anytime the vehicle is within a swath width of the boundary's starting point.

7. To manually close the boundary at any time press **Finish Boundary**.

   A finished boundary is indicated by a solid blue line (Include boundary) or a solid red line (Exclude boundary).

> *Note: You should close the perimeter as close to the starting point as possible.*

The example below shows a finished Right Include boundary.

Chapter 8: Rate Control and Section Control

Rate Control and Section Control Overview
Rate Control
Section Control
Rate and Section Control Scenarios

Rate Control and Section Control Overview

Note: Rate control and section control are optional features available for MAX. Contact Outback Guidance Customer Service for information on rate control and section control systems compatible with MAX.

Outback AC110 works with MAX to provide rate and section application control. Benefits include:

- Variable rate control for a single product (dry, liquid, or anhydrous)
- Ability to apply two products, split among the available sections
- Automatic section control for up to ten sections
- Onscreen display of sections with section override
- Straightforward calibration

Once you install AC110 you must set up (configure) your implement for rate control, section control, or both (depending on what equipment you have installed and the functionality you need). For example, if you have a rate controller and no section controller then you only need to configure rate control settings in MAX.

When you connect AC110 to MAX certain rate control and/or section control panels and buttons become available that you use to set up, calibrate, and use AC110. For example, connecting AC110 makes rate and section control buttons visible on the New Implement Profile panel and Edit Implement Profile panel.

- If you select Spreading as the operation type, the Conveyor Control Settings and Spinner Control Settings buttons appear (panel at near right)
- If you select any other operation type, the Rate Control Settings and Split Load buttons appear (panel at far right)
- The ‘Section Control’ button appears for all operation types (both panels at right)

One of the settings you configure for both rate and section control is Controller Type; once you set this field to something other than ‘None’ related tabs and buttons appear on the map screen, as follows:

- Set Controller Type for rate control - Product Details tab appears on the map screen
- Set Controller type for section control - Sections tab and Boom Override button appear on the map screen

The figures below show the scenarios of rate/section control tabs and buttons displayed on the map screen.

Rate and section control not configured

Section control configured

Rate control configured

Dry rate control configured (only one section)

Rate and section control configured
(liquid/anhydrous operation)

Rate and Section Control Indicators and Buttons

Table 8-1 describes the rate/section control tabs and buttons.

Table 8-1: Rate/section control indicators

Setting	Description
Product Details	The following variations of the Product Details tab are described below the tabs. Provides two functions: • When the arrow points to the right (top figure above) press the arrow to expand the row to display the Actual Rate, Target Rate, and Tank Level. When the arrow points to the left (bottom two figures above) press it to contract the row (hide the Target Rate, Pressure/Spinner, and Tank Level). The values are defined as follows: – Actual Rate - current actual flow rate calculated from the flow meter (when the actual rate is off by 20% from the target rate the actual rate appears in red and the terminal beeps; when not off by 20% the Actual Rate appears in white) – Target Rate - your designated target rate – Pressure - liquid rate control pressure – Spinner - dry rate control spinner speed – Tank Level - current tank volume (decreases as you spray); you reset this value when refilling the tank • Press the Product Details button (far left of row) to display the Product Rate panel

Table 8-1: Rate/section control indicators *(continued)*

Setting	Description
Sections	 Displays section related information and allows you to set each section manually to ON, AUTO, or OFF by pressing the section repeatedly to cycle through the settings. The color of the shading for ON and AUTO indicates spraying (green background) or not spraying (red background). Keep the following in mind when working with sections: • AUTO: turns sections On and Off based on previously applied areas • OFF: section remains Off even if in an unapplied area • ON: section remains On even if in a previously applied area If you are using dry rate control (you select Spreading as the Operation for the implement), the Sections tab defaults to one section and you cannot change the number of sections.
Boom Override	 Press to activate boom override to toggle all sections between an AUTO state and forced ON (opens all section valves) state. When all sections are set to ON the Boom Override button is dark blue; when all sections are set to AUTO the Boom Override button is light blue. If you are using dry rate control (you select Spreading as the Operation for the implement), the Boom Override button defaults to one section (displayed as '1-1') and pressing the button repeatedly toggles the Sections tab setting between ON and AUTO.

Rate Control

Before using rate control you must first set up and calibrate your system. You can also use prescription maps with rate control.

Configuring Your Implement for Rate Control

Note: This section describes how to configure an existing implement for rate control. You can also configure your implement for rate control when first adding the implement to MAX (you just have to complete some implement setup steps first before configuring the implement for rate control). Keep in mind that you must configure each implement that you will use for rate control.

How you configure for rate control depends on whether you will be applying liquid/anhydrous or dry product. Review the information below then proceed to the appropriate section as noted above the panels below.

Liquid/Anhydrous Operation

For liquid or NH3 operations you will use the Rate Control Settings panel to configure your implement.

See “Configuring Your Implement for Liquid/Anhydrous Rate Control” on page 175 for information on this panel.

Dry Operation

For dry operation (Operation type = Spreading), you will use the Conveyor Control Settings and Spinner Control Settings panels to configure your implement.

See “Configuring the Conveyor for Dry Rate Control” on page 180 for information on this panel.

See “Configuring the Spinner for Dry Rate Control” on page 183 for information on this panel.

Configuring Your Implement for Liquid/Anhydrous Rate Control

Before you can use your implement for liquid/anhydrous rate control, you must:

- Configure your implement
- Calibrate your implement

This section describes the how to configure your implement using the Rate Control Settings panel (at right). See "Calibrating for Liquid/Anhydrous Rate Control" on page 185 for calibration information.

Table 8-2 describes the buttons on the Rate Control Settings panel. The On Look Ahead, LowFlow Setting, and Valve Advance fields and Remote Master check box described in the table are accessible after you press the Parameters button on the Rate Control Settings panel.

To display the Rate Control Settings panel, press either of the following:

Menu > Implement Profiles > New Implement > Rate Control Settings

Menu > Implement Profiles > Current Implement > Rate Control Settings

Table 8-2: Liquid/anhydrous rate control settings

Setting	Description
Controller Type	Press to display the Select Controller Type panel (top of panel shown at right). • Setting the Controller Type to something other than 'None' displays the rate control indicators and buttons on the map screen and enables all rate control functionality. • Setting the Controller Type to 'None' disables all rate controller panels and buttons in MAX. Select this option if you are not using rate control.

Table 8-2: Liquid/anhydrous rate control settings *(continued)*

Setting	Description
Rate Valve	Press to display the Valve Type panel (top of panel shown at right). Options are: • **Motorized Direct** Two-wire electric motor opens/closes the flow control valve to increase/decrease the application flow rate. • **Motorized Inverse** Two-wire electric motor opens/closes the flow control valve to inversely decrease/increase the application flow rate. • **PWM** Electrohydraulic solenoid valve proportionally increases application flow rate with increased duty cycle (voltage). • **PWM GROUND** Electrohydraulic solenoid valve proportionally decreases application flow rate with increased duty cycle (voltage). • **PWM 2** Similar to PWM but with a slower algorithm; use when rate control is too unstable when using PWM. • **PWM 2 Ground** Similar to PWM Ground but with a slower algorithm; use when rate control is too unstable when using PWM Ground. • **Positive Close** (On or Off) Select Yes for installations where the rate control valve is also used to stop and start product application, for example when no boom On/Off or section valves are present.
Open Valve and Close Valve buttons	Useful in manually opening and closing the regulating valve to identify if you selected an incorrect Rate Valve option or if a cable is not connected.
Parameters	Press to display the Rate Control Parameters panel (top of panel shown at right), from which you set the following: • On Look Ahead • LowFlow Setting • Valve Advance • Remote Master

Table 8-2: Liquid/anhydrous rate control settings *(continued)*

Setting	Description
On Look Ahead (Parameters panel)	Press to display the On Look Ahead data entry window (shown at right). The On Look Ahead value is the number of seconds before MAX begins to adjust the regulating valve ahead of a rate change (increase the number to turn on sooner). For example, if the setting is 1 second MAX begins to adjust 1 second before it hits the new rate in an upcoming polygon. **This setting applies only to variable rate applications (prescription maps).**
LowFlow Setting (Parameters panel) *continued on next page*	Press to display the LowFlow Setting data entry window (shown at right). Without a LowFlow setting the tips on your sprayer may shut off when flow drops below a certain rate (such as due to a drop in vehicle speed when traveling through a rough spot in the field). The LowFlow value you enter is the flow rate above which MAX will continue to spray (apply product) and not close the regulating value completely and will maintain a minimum flow independent of speed and number of sections closed. To determine the LowFlow Setting value for your implement: 1. Identify the flow rate at which the spray tips begin to shut off. a. *Put the system in Manual mode* Press the **Product Details** button on the map screen to display the Product Rate panel, then press the **Rate Bump** arrows (press the Up arrow to increase the rate or press the Down arrow to decrease the rate) to drop the rate until the tips shut off (see "Using Rate Control" on page 200 for more information). b. *Identify what the flow value is on the Rate and Section Diagnostics screen* Press **Menu > Diagnostics > Rate Section Diagnostics** and observe the value in the Flow field (see "Rate Section Control Diagnostics" on page 254 for more information). 2. Enter a LowFlow Setting value that is slightly higher than the value from the previous step. Press **Menu > Implement Profiles > Current Implement > Rate Control Settings > Parameters > LowFlow Setting**, enter a value in the LowFlow Setting window (shown at right), then press **Done**.

Table 8-2: Liquid/anhydrous rate control settings *(continued)*

Setting	Description
LowFlow Setting *continued*	If a low flow condition occurs during runtime, a red exclamation appears on the Actual Rate section of the Product Details tab. 1. Press **Actual Rate** to display the Rate Section Diagnostics screen with the following message: 2. Press **Ok** to close the message. 3. Take corrective action (such as increasing vehicle speed if that is the cause) to increase flow rate.
Valve Advance (Parameters panel)	**Applies to PWM and motorized valves only** For PWM and motorized valves you can enter a value to increase the valve position when coming out of headlands. For example, if spray comes on and briefly turns off when coming out of a headland (due to the boom having to recharge) you can enter a Valve Advance value to compensate for this. The range of Valve Advance values is from 0 - 20 for PWM and Servo/motorized valves, where: • For PWM, 0 – 20 equals 0 – 30% increase from valve's current position • For motorized, 0 – 20 equals 0 - 2000 ms When you are no longer applying product (Apply button displays Off): • For PWM, the system increases the valves position by the % you entered • For motorized, the system opens the valve the specified number of ms before it normally does

Table 8-2: Liquid/anhydrous rate control settings *(continued)*

Setting	Description
Remote Master (Parameters panel)	If your MAX installation includes the optional switchbox and it is connected to the terminal, the Remote Master check box is available; otherwise, it is unavailable/dimmed (as shown at right). With the optional switchbox connected and the Apply switch (leftmost switch) on the switchbox set to ON, selecting the Remote Master check box enables you to use the vehicle joystick's master switch to turn Apply on or off. *Note: Implementation is dependent on your vehicle installation kit.* See “Using the Switchbox” on page 215 for more information on the switchbox and see “Outback MAX Touchscreen” on page 5 for more information on the Apply button.
Calibration	Press to display the Calibrate Rate Control panel (top of panel shown at right)—see “Calibrating Rate Control” on page 185 for more information.
NH3	Press to display a drop-down list of two options: On and Off. • Set to On for NH3 (anhydrous ammonia) control. Rate will be in lbs nitrogen/acre (US) or kgs nitrogen/hectare (metric). Volume remaining in tank will be lbs or kgs of NH3. • Set to Off to set any other liquid as the application liquid.

Configuring the Conveyor for Dry Rate Control

Before you can use your implement for dry rate control, you must:

- Configure the conveyor and spinner
- Calibrate the conveyor and spinner

This section describes the how to configure the conveyor using the Conveyor Control Settings panel (at right). See “Configuring the Spinner for Dry Rate Control” on page 183 for spinner configuration and “Calibrating Rate Control” on page 185 for conveyor and spinner calibration information.

Table 8-3 describes the buttons on the Rate Control Settings panel.

To display the Conveyor Control Settings panel, press either of the following:

Menu > Implement Profiles > New Implement > Conveyor Control Settings

Menu > Implement Profiles > Current Implement > Conveyor Control Settings

Table 8-3: Conveyor control settings

Setting	Description
Controller Type	Press to display the Select Controller Type panel (top of panel shown at right). • Setting the Controller Type to something other than ‘None’ displays the rate control indicators and buttons on the map screen and enables all conveyor control functionality. • Setting the Controller Type to ‘None’ disables all rate controller panels and buttons in MAX. Select this option if you are not using conveyor control.

Table 8-3: Conveyor control settings *(continued)*

Setting	Description
Conveyor Type	Press to display the Conveyor Type panel (top of panel shown at right). Options are: • **Motorized Direct** Two wire electric motor opens and closes the flow control valve to subsequently increase or decrease the application flow rate respectively. • **Motorized Inverse** Two wire electric motor opens and closes the flow control valve to inversely decrease or increase the application flow rate respectively. • **PWM** Electrohydraulic solenoid valve proportionally increases application flow rate with increased duty cycle (voltage). • **PWM GROUND** Electrohydraulic solenoid valve proportionally decreases application flow rate with increased duty cycle (voltage). • **Positive Close** (On or Off) Select Yes for installations where the rate control valve is also used to stop and start product application, for example when no boom On/Off or section valves are present.
Start Conveyor and Stop Conveyor buttons	Useful in manually stopping and starting the regulating valve to identify if you selected an incorrect Conveyor Type option or if a cable is not connected.
On Look Ahead	Press to display the On Look Ahead data entry window (shown at right). The On Look Ahead value is the number of seconds before MAX begins to adjust the belt speed ahead of a rate change (increase the number to turn on sooner). For example, if the setting is one second MAX begins to adjust one second before it hits the new rate in an upcoming polygon. **This setting applies only to variable rate applications (prescription maps).**

Table 8-3: Conveyor control settings *(continued)*

Setting	Description	
Calibration	Press to display the Calibrate Conveyor panel (top of panel shown at right). See “Calibrating Rate Control” on page 185 for more information on calibrating the conveyor.	

Configuring the Spinner for Dry Rate Control

Before you can use your implement for dry rate control, you must:

- Configure the conveyor and spinner
- Calibrate the conveyor and spinner

This section describes the how to configure the spinner using the Spinner Control Settings panel (at right). See “Configuring the Conveyor for Dry Rate Control” on page 180 for conveyor configuration and “Calibrating Rate Control” on page 185 for conveyor and spinner calibration information.

Table 8-4 describes the buttons on the Spinner Control Settings panel.

To display the Spinner Control Settings panel, press either of the following:

Menu > Implement Profiles > New Implement > Spinner Control Settings

Menu > Implement Profiles > Current Implement > Spinner Control Settings

Table 8-4: Spinner control settings

Setting	Description
Controller Type	Press to display the Select Controller Type panel (top of panel shown at right). • Setting the Controller Type to something other than ‘None’ displays the rate control indicators and buttons on the map screen and enables all rate control functionality. • Setting the Controller Type to ‘None’ disables all rate controller panels and buttons in MAX. Select this option if you are not using rate control.

Table 8-4: Spinner control settings *(continued)*

Setting	Description
Spinner Type	Press to display the Select Spinner Type panel (top of panel shown at right). Options are: • **Motorized Direct** Two-wire electric motor opens and closes the flow control valve to subsequently increase or decrease the application flow rate respectively. • **Motorized Inverse** Two-wire electric motor opens and closes the flow control valve to inversely decrease or increase the application flow rate respectively. • **PWM** Electrohydraulic solenoid valve proportionally increases application flow rate with increased duty cycle (voltage). • **PWM GROUND** Electrohydraulic solenoid valve proportionally decreases application flow rate with increased duty cycle (voltage).
Spinner Speed button	Press to display the Spinner Speed data entry window (shown at right), where you set the spinner speed (dry 'spray' width)
Start Spinner and Stop Spinner buttons	Useful in manually opening and closing the regulating valve to identify if you selected an incorrect Spinner Type option or if a cable is not connected.
Calibration	Press to display the Calibrate Spinner panel (top of panel shown at right). See "Calibrating Rate Control" on page 185 for more information on calibrating the spinner.

Calibrating Rate Control

Before calibrating for rate control, make sure you have properly configured your implement for rate control. See the previous section “Configuring Your Implement for Rate Control” for more information. How you calibrate rate control depends on whether you will be applying liquid/anhydrous or dry product. Review the information below then proceed to the appropriate section as noted above the panels below.

Liquid/Anhydrous Operation

For liquid or NH3 operations you will use the Calibrate Rate Control panel for calibration.

See “Calibrating for Liquid/ Anhydrous Rate Control” on page 185 for more information.

Dry Operation

For dry operation (Operation type = Spreading), you will use the Calibrate Conveyor and Calibrate Spinner panels for calibration.

See “Calibrating the Conveyor for Dry Rate Control” on page 189 for more information.

See “Calibrating the Spinner for Dry Rate Control” on page 193 for more information.

Calibrating for Liquid/Anhydrous Rate Control

Before using rate control for liquid/anhydrous (NH3) operation, you must calibrate the rate control valve on your implement using the Calibrate Rate Control panel (at right).

Perform the following (with the vehicle parked or moving) before calibrating the flow:

- Make sure the tank is clean then fill with several hundred gallons of water
- Unfold the booms and move the vehicle to a safe location
- Make sure the vehicle is running at the operating RPM used for spraying

Table 8-5 describes the buttons on the Calibrate Rate Control panel. The ‘Calibration Values’ fields in the table are accessible after you press the Calibration Values button on the Calibrate Rate Control panel.

Table 8-5: Liquid/anhydrous rate control calibration

Setting	Description
Meter Calibration	Locate the meter calibration tag or stamp on the flow meter and the corresponding calibration value. • For Raven systems, divide the calibration number by 10 and enter this number. For example, if 169 is the calibration value, enter 16.9. • For TeeJet meters, enter the number as is. Many TeeJet meters list the calibration value in pulses/liter. It may be easier to change the units of measure in MAX to metric, enter the meter calibration, then change units of measure back to U.S. After you enter a Meter Calibration value and press Done to close the window, the System Calibration button on the Calibrate Rate Control panel becomes active.
Pressure Calibration	There are two pressure calibration settings (Pressure 1 and Pressure 2). Use the following procedure for each setting. 1. Enter a calibration value of 100 as a starting point. 2. Compare the pressure reading (on the Rate Section Control Diagnostics screen) to that of a manual gauge and adjust the Pressure Calibration value up and down to make it match. If no manual gauge is available, use the flow rate (on the Rate Section Control Diagnostics screen) to calculate a pressure based on your spray tip orifice size. See “Rate Section Control Diagnostics” on page 254 for more information on the Rate Section Control Diagnostics screen.

Table 8-5: Liquid/anhydrous rate control calibration *(continued)*

Setting	Description
System Calibration	This button is only available (not grayed out) after you enter a Meter Calibration value. 1. Press **System Calibration** to start the system calibration process—a Calibrate message appears. 2. Press **Yes**. The calibration process starts and may take up to ten minutes. A progress message (with elapsed calibration time) appears during calibration. *To cancel the calibration press **Cancel** in the message window.* 3. Once calibration is complete a message window appears—press **Ok** to close the message.

Table 8-5: Liquid/anhydrous rate control calibration *(continued)*

Setting	Description
Calibration Values	***Caution:*** *The values on this panel are set during the calibration process. Outback recommends that you contact Outback Customer Service or your local dealer before changing any of these values.* Press to the display the Calibration Values panel (top of panel at right). To edit the values, press the appropriate button and use the data entry window that appears to enter a value. • K (shown lower right) - gain, or how fast the system attempts to hit the target rate. • Trigger (l/min) - how soon before the target rate the system switches to fine control. • Flow Range (l/min) - distance (range) between high flow and low flow. • Min PWM - minimum voltage (percentage) to receive a control valve response. • Time Response - measure of how quickly the rate control system will react before adjusting the actual rate when it deviates from the target rate • Max PWM - maximum voltage (percentage) to receive a control valve response.

Calibrating the Conveyor for Dry Rate Control

Before using rate control dry operation, you must calibrate the conveyor and spinner. Use the Calibrate Conveyor panel (top of panel shown at right) to calibrate the conveyor. See “Calibrating the Spinner for Dry Rate Control” on page 193 for spinner calibration.

Table 8-6 describes the buttons on the Calibrate Conveyor panel. The ‘Calibration Values’ fields in the table are accessible after you press the Calibration Values button on the Calibrate Conveyor panel.

Table 8-6: Conveyor dry rate control calibration

Setting	Description
Density Calibration	Press to display the Density Calibration data entry window (shown at right), where you enter the density of the product (user-provided value).

Table 8-6: Conveyor dry rate control calibration *(continued)*

Setting	Description
Gate Height	Press to display the Gate Height data entry window (shown at right), where you enter the gate height (user-provided value).
Conveyor Calibration	To perform conveyor calibration: 1. Press **Conveyor Calibration**. A Calibrate message appears. 2. Follow the directions to disengage the spinner and place a container under the conveyor to catch material, then press **Yes**. The calibration process starts and a progress message (with elapsed calibration time) appears. *To stop the calibration press **Stop**.* 3. Weigh the material and enter the weight value in the Volume Calibration window (see below).

Table 8-6: Conveyor dry rate control calibration *(continued)*

Setting	Description
Volume Calibration	Press to display the Volume Calibration data entry window (shown at right), where you enter the value obtained from the conveyor calibration (see above).
System Calibration	To calibrate the conveyor system: 1. Press **System Calibration** to start the system calibration process a Calibrate message appears. 2. Press **Yes**. The calibration process starts and may take up to ten minutes. A progress message (with elapsed calibration time) appears during calibration. *To cancel the calibration press **Cancel** in the message window.* 3. Once calibration is complete the following message appears—press **Ok** to close the message.

Table 8-6: Conveyor dry rate control calibration *(continued)*

Setting	Description
Calibration Values	***Caution:*** *The values on this panel are set during the calibration process. Outback recommends that you contact Outback Customer Service or your local dealer before changing any of these values.* Press to the display the Calibration Values panel (top of panel shown at right). To edit the values, press the appropriate button and use the data entry window that appears to enter a value. • Meter Calibration - resulting value of completed conveyor calibration (this is an advanced diagnostic parameter—if you need to adjust this value, contact Outback Guidance Customer Service for assistance). **Meter Calibration is available (not dimmed) only after you enter a Volume Calibration value (see previously in this table).** • K - gain, or how fast the system attempts to hit the target rate. • Trigger (l/min) - how soon before the target rate the system switches to fine control. • Flow Range (l/min) - distance (range) between high flow and low flow. • Min PWM - minimum voltage (percentage) to receive a control valve response. • Time Response (shown at right) - measure of how quickly the rate control system will react before adjusting the actual rate when it deviates from the target rate. • Max PWM - maximum voltage (percentage) to receive a control valve response.

Calibrating the Spinner for Dry Rate Control

Before using rate control dry operation, you must calibrate the conveyor and spinner. Use the Calibrate Spinner panel (top of panel shown at right) to calibrate the spinner. See “Calibrating the Conveyor for Dry Rate Control” on page 189 for conveyor calibration.

Table 8-7 describes the buttons on the Calibrate Spinner panel. The ‘Calibration Values’ fields in the table are accessible after you press the Calibration Values button on the Calibrate Spinner panel.

Table 8-7: Spinner dry rate control calibration

Setting	Description	
Sensor Count	Press to display the Sensor Count data entry window (shown at right), where you enter the sensor count (for example, the number of bolts or bars on the spinner that pass the sensor during one revolution). This value is usually 1, 2, or 4.	

Table 8-7: Spinner dry rate control calibration *(continued)*

Setting	Description
System (Spinner) Calibration	To calibrate the spinner: 1. Press **System Calibration** to start the spinner system calibration process a Calibrate message appears. 2. Press **Yes**. The calibration process starts and may take up to 10 minutes. A progress message (with elapsed calibration time) appears during calibration. *To stop the calibration press **Stop** in the message window.* 3. Once calibration is complete the following message appears—press **Ok** to close the message. 4. Power off the AC110 then power it back on.

Table 8-7: Spinner dry rate control calibration *(continued)*

Setting	Description
Calibration Values	***Caution:*** *The values on this panel are set during the calibration process. Outback recommends that you contact Outback Customer Service or your local dealer before changing any of these values.* Press to the display the Calibration Values panel (top of panel shown at right). To edit the values, press the appropriate button and use the data entry window that appears to enter a value. • K (shown bottom right) - gain, or how fast the system attempts to hit the target rate. • Trigger (l/min) - how soon before the target rate the system switches to fine control. • Flow Range (l/min) - distance (range) between high flow and low flow. • Min PWM - minimum voltage (percentage) to receive a control valve response. • Time Response - measure of how quickly the rate control system will react before adjusting the actual rate when it deviates from the target rate.

Setting Up Rate Control

Use the Rate Control panel (top of panel shown at right) to set up rate (flow) control parameters. Table 8-8 describes the buttons on the Rate Control panel.

To access the Rate Control panel, press either of the following:

Menu > Settings > Rate Control

Product Details (upper left of map screen) > Rate Control

Table 8-8: Rate Control panel settings

Setting	Description
Rx Maps	Press to display the Rx Map Files panel (shown at right) where you select a prescription map to load and display on the map screen. You can use prescription maps located on the MAX hard drive or import prescription maps from a USB drive or from your Outback ConnX account. See “Using Prescription Maps” on page 201 for information on loading and using prescription maps. *Note: The Rx Maps button is available only if you have an active (current) job; otherwise the button is dimmed (not available).*

Table 8-8: Rate Control panel settings *(continued)*

Setting	Description
Rate 1 Rate 2	Press to display the Rate 1 and Rate 2 data entry windows (Rate 1 window shown at right) where you enter predefined flow rates. You can change these rates on the fly during application.
Tank Level	Press to display the Tank Level data entry window (shown at right). Enter the volume of product in the tank. You will need to adjust this value after each load. While spraying, MAX subtracts from this value what has been applied and this current volume appears on the Product Details tab (see Table 8-1 on page 172).
Reset Tank To	Press to reset the tank level to the original level you entered for the Tank Level (see previous row in this table). This enables you to reset the tank level to full with one button push when refilling the tank; otherwise, you have to re-enter data values for a full tank in the Tank Level data entry window.

Table 8-8: Rate Control panel settings *(continued)*

Setting	Description
Applied Color Map	Press to display the Applied Color Map panel (top of panel shown at right). This panel enables you to set the High and Low flow rates and associated colors that are displayed on the “As Applied” rate map. When loading a prescription map, the High and Low Rates are automatically set to the high and low rate values on the map. The figures below show the relationship between setting the High and Low rates and the color scale MAX uses when applying rates including and between the High and Low rates. The Applied Color Legend appears on the Product Rate panel (see Figure 8-1 on page 200).
Delete Rx Maps	Allows you to delete prescription maps from the MAX hard drive. See “Deleting a Prescription Map” on page 202 for more information.

To set up rate (flow) control:

1. Press **Menu > Settings > Rate Control** (or press **Product Details > Rate Control**). The Rate Control panel appears.
2. (OPTIONAL) Load a prescription map. See “Using Prescription Maps” on page 201 for more information on selecting a prescription map.
3. Enter flow rates for Rate 1 and Rate 2.
   a. Press **Rate 1**. The Rate 1 data entry window appears.

b. Enter a flow rate and press **Done**. The data entry window closes and the rate appears on the Rate 1 button.

c. Repeat steps a and b for Rate 2.

4. Enter the tank level:

   a. Press **Tank Level**. The Tank Level date entry window appears.

   b. Enter the tank level and press **Done**. The data entry window closes and the rate appears on the Tank Level button.

5. Set the rate and color for the high rate and low rate when displaying applied color maps.

   a. Press **Applied Color Map**. The Applied Color Map panel appears.

   b. Press **High Rate** or **Low Rate** (left side of button). The corresponding rate panel appears (High Rate example shown at right).

   c. Enter a rate and press **Done**. The panel closes and the new rate appears on the rate button.

   d. Press the color (right side) of the High Rate or Low Rate button. The Select Color window appears.

   e. Press a color (the window closes and the new color appears on the rate button) then press **Save**.

   f. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

Using Rate Control

After you set your rate/section control parameters and calibrate rate control you work with rate control via the Product Details tab (see Table 8-1 on page 172) and the Product Rate panel (see Figure 8-1 below). As shown below what is displayed on the Product Rate panel depends on the button you press at the top of the panel.

Figure 8-1: Product Rate panel

When using rate control you can change the target rate incrementally while operating.

Note: You can also change the default target rates (as well as other rate control settings) by pressing Rate Control on the Product Rate panel to access the Rate Control panel (see "Setting Up Rate Control" on page 196).

To change the target rate while operating:

1. Press the **Product Details** button (shown at right) on the map screen. The Product Rate panel appears.
2. Press **Rate 1** or **Rate 2**.
3. Press the **Rate Bump** arrows—press the Up arrow to increase the rate or press the Down arrow to decrease the rate. The rate changes on the Product Rate panel and the Target Rate changes on the Product Details tab in the upper left of the map screen. Each button increments/decrements by 1 gallon or 10 liters.

4. Press **Close** when finished to close the Product Rate panel.

Using Prescription Maps

A prescription map (Rx map) is a map of a particular land area divided into sections of different application rates. You use prescription maps in conjunction with rate control functionality to automatically spray different areas of your farm at different flow rates.

Note: You must select the Prescription button on the Map Layers panel (see "Map Layers" on page 120) for prescription maps to appear on the screen.

Loading a Prescription Map

You can only load a prescription map when you have an active job—you are loading the map for use during that job. If this is the first time you are loading a specific prescription map you must load the map from a USB drive or your Outback ConnX account. When the map is loaded it is:

- Stored on the MAX hard drive
- Attached to the active job (MAX automatically loads that prescription map whenever you open that same job as long as that prescription map remains on the hard drive)

Once the prescription map is stored on the MAX hard drive you can load that map for use during a different job (once that job is active). During this process you load the map from the hard drive.

When you first load a prescription map (from a USB drive or your Outback ConnX account) you actually load a shape (.shp) file—a popular map format for GIS software commonly used for rate control maps. You then select a data type and rate. MAX then converts the .shp file into a prescription map (.pmh file) and stores it on the hard drive. Therefore, when you load a prescription map from the hard drive you load a .pmh file, not a .shp file (because MAX has already converted the file for use).

To load a prescription map:

1. Press **Menu > Settings > Rate Control > Rx Maps**. The Rx Map Files panel appears (shown at right).
2. Press the green button at the top of the panel, and from the drop-down list that appears select an option: Hard Drive, USB, or ConnX.

   ConnX only appears if you are logged into your Outback ConnX account through MAX. Hard Drive only appears if you previously loaded the .shp file from a USB drive or your Outback ConnX account and MAX converted the file to a .pmh file and stored it on the hard drive.

   The prescription map files in the selected location appear in the list on the panel (USB example of .shp files shown at right).
3. Use the up/down scroll buttons to scroll through the list of files then press to select the desired file (.pmh file or .shp file).

- If you are loading a previously loaded prescription map (.pmh file), the panels close, MAX briefly displays a message similar to at right and the prescription map appears on the map screen. You are finished with this procedure.

- If you are loading a prescription map for the first time (selecting a .shp file), MAX will convert the .shp file after you select the data type and units—go to step 4.

4. On the Rx Map Layers panel select the desired data type. The Rx Map Units panel appears (shown at right).
5. Select the desired units. The panels close and a message similar to the following appears briefly while MAX converts the .shp file.

When the conversion is complete MAX briefly displays a message similar to the following and the prescription map appears on the map screen.

Deleting a Prescription Map

Caution: *Once you delete a prescription map it is permanently removed from memory; you cannot retrieve a deleted prescription map.*

To delete a prescription map:

1. Press **Menu > Settings > Rate Control > Delete RxMaps**. The Delete RxMaps panel appears (shown at right).
2. Use the up/down scroll buttons to scroll through the list of prescription maps then press to select the map(s) you want to delete. If you want to delete all maps press **Select All**.

   Press **Delete**. The prescription map is deleted and the panels close.

Section Control

You must enter specific section control settings (see below) before using MAX for section control (see “Using Section Control” on page 207).

Setting Up Section Control

Note: This section describes how to set up section control for an existing implement. You can also set up section control while setting up a new implement (you just have to complete some implement setup steps first before setting up section control). See “Adding an Implement” on page 82 for more information.

You use the Section Control panel (shown at right) to enter section control settings for an implement. Table 8-9 describes each button on the panel.

To access the Section Control panel, press **Menu > Current Implement > Section Control**.

Table 8-9: Section Control panel settings

Setting	Description
Controller Type	Press to display the Select Controller Type panel (top of panel shown at right). • Setting the Controller Type to something other than ‘None’ displays the section control indicators and buttons on the map screen and enables all section control functionality. • Setting the Controller Type to ‘None’ disables all section controller panels and buttons in MAX. Select this option if you are not using section control.

Table 8-9: Section Control panel settings *(continued)*

Setting	Description
Section Valve	Press to display the Valve Type panel (top of panel shown at right). Identify the wiring going to boom valves. Valve types are: • **Motorized 2 Direct** Electric motorized valve that is: 1) driven open with a positive voltage signal, and 2) driven closed by a negative voltage signal across two signal wires. • **Motorized 2 Inverse** Electric motorized valve that is: 1) driven open with a positive voltage signal, and 2) driven closed by a negative voltage signal across two signal wires. • **Motor/SOL 1 Direct** Electric motor or solenoid valve that is: 1) driven open with a single positive voltage signal, and 2) returned to a closed position by a spring or other automatic means. • **Motor/SOL 1 Inverse** Electric motor or solenoid valve that is: 1) driven closed with a single positive voltage signal, and 2) returned to an opened position by a spring or other automatic means.
Number of Sections	Press to display the Number of Sections data entry window (shown at right) where you set the number of sections. If you are performing dry rate control operation, there is only one section the Number of Sections button is unavailable (dimmed).
Test Sections	Allows you to test each section before operation. When you press the button MAX displays the window shown at right.

Table 8-9: Section Control panel settings *(continued)*

Setting	Description
Section Location/ Width	Press to display the Section Widths panel (shown at right) where you enter the section width for each section or for all sections equally (Auto-Locate). *Note: If you change section widths and the total is more or less than the original implement width (Width button on Edit Implement Profiles panel), the original implement width is adjusted to equal the new total.*
Coverage	Press to display the Coverage data entry window (shown at right) where you enter the percentage of the boom section that must enter or exit a previously applied area before AC110 will turn it off or on.

Table 8-9: Section Control panel settings *(continued)*

Setting	Description
On Time	Press to display the On Time data entry window (shown at right). Enter the number of seconds needed to open the boom valves and build pressure ahead of an unapplied area. Increase the number to turn on sooner.
Off Time	Press to display the Off Time data entry window (similar to the On Time data entry window). Enter the number of seconds needed to close the boom valves ahead of a previously applied area. Increase the number to turn off sooner.
External Switches	Selecting this option (check mark appears in the box) enables you to perform the following section control functions using the joystick or boom switches built into your vehicle instead of using the map screen indicators/buttons on the terminal: • Turn Apply button ON and OFF • Toggle individual sections between ON and AUTO If your MAX installation includes the optional switchbox and it is connected to the terminal, the External Switches check box is unavailable/ dimmed (as shown at right) because the switchbox performs similar functions. *Note: Implementation is dependent on your vehicle installation kit.*

To set up section control:

1. Press **Menu > Implement Profiles > Current Implement > Section Control**. The Section Control panel appears (see panel at top right of page 203).
2. Select a controller type:
   a. Press **Controller Type**. The Select Controller Type panel appears.
   b. Press the desired type. The Select Controller Type panel closes and your selection appears on the Controller Type button.
3. Select a section valve:
   a. Press **Section Valve**. The Valve Type panel appears.
   b. Press the desired type. The Valve Type panel closes and your selection appears on the Section Valve button.
4. Set the number of sections:
   a. Press **Number of Sections**. The Number of Sections data entry window appears.

b. Enter the number of sections and press **Done**. The data entry window closes and the number appears on the Number of Sections button.

5. (OPTIONAL) Test each section.
   a. Press **Test Sections**. A message appears verifying you want to test the sections.
   b. Press **Yes**. A message appears indicating the first section is being tested.

   The progress bar updates as each section opens and closes. This continues until all sections are tested then the message closes.

6. (OPTIONAL) Edit the section widths.

   To set an individual section:

   a. Press **Section Location/Width**. The Section Widths panel appears.
   b. If necessary, press the button at the top of the panel to display the correct group of sections. For example, if there are 10 sections and you want to change section 9 but the panel displays sections 1-8, press the **9-10** button to display sections 9 and 10.
   c. Press the button for the section width you want to change, enter a new value, then press **OK**.

   To set all sections to equal widths (default setting):

   a. Press **Section Location/Width**. The Section Widths panel appears.
   b. Press **Auto-Locate**.

7. Enter coverage, on time, off time values by pressing each button, entering a value, then pressing **Done**. The value entered is displayed on its button.
8. (OPTIONAL) Press **External Switches** (place a check mark in the box) to use the joystick or boom switches built into your vehicle (instead of using the map screen indicators/buttons) to turn Apply button ON and OFF and toggle individual sections between ON and AUTO.

Using Section Control

Make sure you are familiar with the settings and the background colors for the settings on the Sections tab (upper left corner of map screen) before performing the following two procedures.

Overriding All Sections

Note: If you are performing dry rate control operation, the Boom Override button is unavailable (dimmed). See "Rate Control and Section Control Overview" on page 170 for more information.

You can quickly override individual boom settings and set all sections to ON or AUTO using the Boom Override button on the map screen. Press the Boom Override button on the map screen. Pressing this button toggles between setting all sections to AUTO or setting all sections to ON. When all sections are set to ON the Boom Override button is dark blue; when all sections are set to AUTO the Boom Override button is light blue.

Setting Individual Sections to AUTO, ON, or OFF

Note: If you are performing dry rate control operation, there is only one section. See "Rate Control and Section Control Overview" on page 170 for more information.

At any time you can set each section individually to AUTO, ON, or OFF. Press an individual section button repeatedly to cycle through the three settings for that section. If you are currently spraying you will see:

- No spray for sections you turn OFF (even if in an unapplied area)
- Spray for sections you turn ON (even if in a previously applied area)

Rate and Section Control Scenarios

Use the scenarios in Table 8-10 to familiarize yourself with the elements of the MAX display related to rate/section control functionality.

Table 8-10: Rate/section control scenarios

Map Screen	Scenario
	Target Rate (using Rate 1) manually increased from 12.0 to 14.0 (Rate 1 button in Product Rate panel is green; Product 1 Details tab shows new target rate) No spraying (Apply button is not pressed—button color is blue/gray and displays "Off"; background is red for "AUTO" on Sections tab; no spray color appears trailing the implement) Auto mode enabled ("AUTO" is highlighted on Sections tab)
	On Product 1 Details tab the Actual Rate is a non-zero value and the Tank Level is below its initial level and decreasing (based on usage) Spraying enabled (Apply button pressed—button color is green and displays "On") Auto mode enabled ("AUTO" is highlighted on Sections tab) Spraying occurring in all sections (background is green for "AUTO" on Sections tab; spray color appears trailing the implement)

Table 8-10: Rate/section control scenarios *(continued)*

Map Screen	Scenario
	On Product 1 Details tab the Actual Rate is equal to the Target Rate (bumped up from 12.0 to 14.0) and the Tank Level is below its initial level and decreasing (based on usage) Spraying enabled (Apply button pressed—button color is green and displays “On”) Auto mode enabled (“AUTO” is highlighted on Sections tab) Spraying occurring in all sections (background is green for “AUTO” on Sections tab; spray color appears trailing the implement)
	On Product 1 Details tab the Actual Rate is below the Target Rate (bumped up from 12.0 to 14.0) and the Tank Level is below its initial level and decreasing (based on usage) Spraying enabled (Apply button pressed—button color is green and displays “On”) For sections 2, 3, 4: • Auto mode is enabled (“AUTO” highlighted on Sections tab) • Spraying is occurring (background is green for “AUTO” on Sections tab) • Spray color appears trailing the implement for these sections For sections 1, 5: • Manually turned off (“OFF” highlighted red on Sections tab) • No spray color trailing the implement for these sections

Table 8-10: Rate/section control scenarios *(continued)*

Map Screen	Scenario
	Spraying enabled (Apply button pressed and green) Auto mode is enabled (“AUTO” highlighted on Sections tab) No spraying occurring in all sections: • Actual Rate is zero on Product Details tab • Background is red for AUTO on Sections tab • Headland alert symbol is displayed below Boom Override button
	Spraying enabled (Apply button pressed and green) Auto mode is enabled (“AUTO” highlighted on Sections tab) Dry operation • Spinner field appears on Product Details tab • One section on Sections tab • ‘1-1’ displayed on Boom Override button

Chapter 9: Other Optional Features

Using External Cameras

Using the External Lightbar

Using the Switchbox

Using the Web Feature

Using Corporate Farm

Using External Cameras

You can connect up to four analog cameras to MAX using the optional video cable. Refer to the Outback MAX Quick Start Guide included with your MAX kit for information on connecting the video cable.

Note: Cameras are not included in your MAX system. Contact your dealer for information on purchasing cameras (and any additional cables) suitable for your MAX system.

To display the Camera window:

- Press the **Camera** button at the bottom right of the map screen (top figure at right) to display the camera window (bottom figure at right).

The camera window allows you to view:

- Each camera individually in default view (small window, as shown above)
- Each camera individually in full screen view (window fills the screen)
- All four cameras at once (grid of four cameras that fills the screen)
- Flip any camera image horizontally (mirror image)

See Figure 9-1 on the following page for information on displaying different cameras and camera views.

Figure 9-1: Camera window options

The two images below illustrate how the flip feature works. A flipped image is simply a mirror image (note the spelling of the tractor manufacturer on the tractor hood).

Default image

Flipped image

As an alternative to pressing the Close button in the small camera window you can also press the Camera button (lower right of map screen) to close the small camera window. You also can move the camera window around on the screen by placing your finger on camera window and dragging the window to the desired location.

Using the External Lightbar

The red and green lights on the external lightbar work just like the red and green bars on the onscreen lightbar. See (Exit warning) for information on the onscreen lightbar.

Figure 9-2 shows the onscreen and external lightbar under similar scenarios.

Vehicle centered on guidance line

Vehicle steering left of guidance line

Vehicle steering very far left of guidance line

Vehicle steering right of guidance line

Vehicle steering very far right of guidance line

Figure 9-2: Onscreen and external lightbar comparison

Using the Switchbox

The optional external switchbox enables you to perform the following tasks that you normally would perform via the MAX terminal touchscreen:

- Apply spray
- Toggle sections between ON, OFF, and AUTO
- Select Rate 1, Rate 2, or the current prescription map
- Bump rates

Figure 9-3 points out these functions on the switchbox.

Figure 9-3: Switchbox controls

Note: Refer to the appropriate sections in Chapter 8, "Rate Control and Section Control" for more information on rate control and section control.

When you connect the switchbox certain buttons/controls are disabled on the MAX touchscreen:

- Sections tab is read-only (functionality is controlled via switchbox)
- Boom Override button is not displayed
- Rate 1, Rate 2, and Rx buttons are not available (functionality is controlled via switchbox)

The Manual button on the touchscreen is still available and is the only way to turn Manual mode ON or OFF—press the Manual button once to turn it ON and press it again to turn it OFF and return the rate to whatever is selected on the switchbox.

Figure 9-4 illustrates the changes to the touchscreen with the switchbox connected.

Sections tab is dark gray (read-only)

Rate 1 is selected on switchbox (faded green background on button)

Rate 2 and Rx buttons are dark gray (not selected and only available via switchbox)

Manual button is light blue (available)

Sections tab is dark gray (read-only)

Rate 1, Rate 2, and Rx buttons are dark gray (not selected and only available via switchbox)

Manual button is selected (bright green) onscreen, regardless of what is selected on switchbox

Figure 9-4: Rate/section control controls with connected switchbox

Using the Web Feature

Web access is an optional MAX feature.

Use the following table to access, navigate, and use the web feature.

Table 9-1: Web feature tasks

Task	Procedure
Access the web	Press **Menu > Web**. A browser window appears full screen. Your MAX terminal must be authorized for this feature; otherwise, the Web button on the Menu Options panel is unavailable (dimmed).

Table 9-1: Web feature tasks *(continued)*

Task	Procedure
Go to a specific website	1. Press the address bar showing the current website to display the web address window. 2. Press to clear the current address, enter a new address, then press **Done**.
Go back to the home page	Press the **Home** button .
Go back and forward	Press the back button or the forward button at the top of the web browser. Back Forward

Table 9-1: Web feature tasks *(continued)*

Task	Procedure
Change default settings	Press the Tools button . The Web Browser Options window appears. • *To change the home page:* Press the **Home Page** text box (where the address appears). • *To change the font size:* Press **Font Size**, enter a value in the Enter Font Size window, then press **Done**. • *To clear history:* Press **Clear History** and in the window that appears press **Yes**.
View favorites	Press and in the drop-down list of favorites press the desired website.

Table 9-1: Web feature tasks *(continued)*

Task	Procedure
Add a website to the favorites list	Go to the website then press the **Add to Favorites** button . In the window that appears confirming the favorite was added press **Ok**.
Delete a favorite from the favorites list	Press **Favorites** and in the drop-down list of favorites press next to the favorite you want to delete.
Delete (clear) all favorites from the favorites list	Press **Favorites** and below the drop-down list of favorites press **Clear All**. In the window that appears asking if you want to clear favorites, press **Yes**. When all favorites are cleared the Favorites button is darker ( ) to indicate there are no favorites.

Using Corporate Farm

Corporate Farm is an optional feature (requiring an authorization) that allows you to provide limited access to all but administrator accounts. For example, you may want users (operators) to be able to add a vehicle but not add a product. Operator accounts only have access to what the administrator places on the Favorites panel. This section describes how to enable Corporate Farm and to log in/out. See “Favorites” on page 14 for more information on using Favorites.

To enable Corporate Farm (administrator task):

1. Press **Menu > Settings > Corporate Farm**. The Corporate Farm panel appears (top of panel shown at right).

2. Press **Corporate Farm**. A progress window appears. When the process is complete, the progress window closes, the Corporate Farm button displays On, and the Password and Logout buttons are enabled (shown at right). Corporate Farm is enabled and you are logged in as the administrator.

Before you can log in, the current user has to log out (or be logged out).

To log out and log in:

1. Press **Menu > Settings > Corporate Farm**. The Corporate Farm panel appears. If the current user is the administrator, all three buttons are active

(below left); if the current user is an operator user (non-administrator), only the Logout button is active (below right).

2. Press **Logout**. A message appears with “Logging Out. Please Wait”...when the message closes the Corporate Farm Login screen appears.

3. Press **Administrator** to log in as the administrator or press **Operator** to log in as an operator.
   - When you press Administrator the Enter Password window appears. Enter the administrator password and press **Done**.

   A message appears with “Switching to Administrator, Please Wait”...when the message closes the Start Up Menu appears with all buttons on the Start Up Menu active.

   - When you press Operator a message briefly appears with “Switching to Operator, Please Wait”...when the message closes the Start Up menu appears (not all buttons on the Start Up Menu many be active—this depends on what the administrator has set up for operator accounts).

Appendix A: Status and Diagnostics

Viewing Status and Diagnostics Information
GPS
Terminal Diagnostics
Updating Terminal Software
eDriveX
Rate Section Control Diagnostics
ISO VT Diagnostics
High Speed Logging
Task Controller Status
Capturing Screen Images

This appendix contains information on viewing diagnostics information available on several MAX screens (and troubleshooting issues that arise using this information) and capturing screen images.

Viewing Status and Diagnostics Information

MAX includes status and diagnostics screens that provide useful information to verify certain settings as well as troubleshoot issues. All status and diagnostics screens are accessible from the Diagnostics panel.

- The GPS and eDriveX buttons each display additional panels from which you can access various related status and diagnostic information. The eDriveX button is active only if eDriveX is communicating with the terminal—that is, eDriveX is connected to the terminal and powered on.
- The High Speed Logging button toggles between On and Off (there is no separate screen).
- The remaining buttons on the Diagnostics panel display a separate screen of status/diagnostics information.

To display a status or diagnostics screen:

1. Press **Menu > Diagnostics**. The Diagnostics panel appears.
2. Press the appropriate button to display the related status or diagnostics screen.
3. Press **Back/Close** repeatedly or press the Close arrow to close the panels and return to the map.

To display the eDriveX Status screen (alternate method, if error exists), press the error symbol (red circle with exclamation point) on the upper left of the Steering button on the map screen

GPS

The GPS panel (top of panel shown at right) provides GPS, receiver, and corrections status information and also includes a link to your subscription information.

To display the GPS panel, press **Menu > Diagnostics > GPS**.

As shown in the four GPS panels below, the correction type button that appears below the Subscriptions button depends on the correction type you select (RTK, OmniSTAR, e-Dif). No button appears if SBAS is the correction type, as this information is displayed on the GPS Status screen. See “Correction Type” on page 21 for more information.

SBAS corrections

RTK corrections

OmniSTAR corrections

e-Dif corrections

GPS Status

The GPS Status screen displays read-only GPS information you may find useful, especially if you need to troubleshoot an issue.

To display the screen, press **Menu > Diagnostics > GPS > GPS Status**.

Table A-1 describes each field on the GPS Status screen.

Table A-1: GPS Status screen fields

Field	Description
Time	Current time
Latitude	Vehicle's current latitude position
Longitude	Vehicle's current longitude position
Altitude	Vehicle's current altitude
Speed	Vehicle's current speed
Heading	Vehicle's current heading in degrees
Diff Age	Age of the corrections used in the DGPS calculation. Values > 120 seconds require acquiring a new RTK lock. For SBAS, the Diff Age is typically 6 to 10 seconds.
Std Dev	Pseudo-estimate of the DGPS solution accuracy determined as the RMS value of the positional residual errors. STDEV is valid only if 6 or more satellites are used in the solution calculation. Typical values for SBAS correction are 0.5 ft – 1.5 ft (0.15m – 0.45m). Typical values for RTK corrections are < 0.1 ft (3 cm).
Status	Status of the GPS receiver to receive GPS differential corrections
Correction Type	Type of differential correction being used—may be WAAS (for SBAS), RTK, or LBAND (for OmniSTAR)
Station ID	ID of correction station
Sats Used	Number of GPS satellites used to calculate the position

Table A-1: GPS Status screen fields *(continued)*

Field	Description
Signals	GNSS signals being used
Quality	Quality of GNSS signals
SBAS PRN	Satellites used by SBAS
BER	Bit error rate Relative strength of the correction satellites. In the case of WAAS, two numbers are shown separated by a hyphen. The number can be from 0 to 500, with 0 being the best and 500 being the worst. If BER > 20 verify the antenna has a clear view of the sky to properly find and track correction satellites. MAX tracks multiple correction satellites, each satellite has a different BER, and the value in the BER field represents each value separated by a hyphen. For example, a value of 8-500 means MAX has a very good signal on one satellite (BER=8) and is not receiving corrections from the other satellite (BER=500, the lowest reception value). Only one satellite must have a low BER value (less than 20) to provide differential corrections.
Available Diff	Differential corrections the receiver is getting
Excluded	Differential corrections the receiver is not using (excluded from the differential solution)
Modes	Current operating modes that control various GPS tracking parameters
Accuracy	RTK accuracy status value

Receiver Status

The Receiver Status screen displays read-only GPS information related to your MAX receiver.

To display the screen, press **Menu > Diagnostics > GPS > Receiver Status**.

Table A-2 describes each field on the Receiver Status screen.

Table A-2: Receiver Status screen fields

Field	Description
Receiver	Receiver technology (board)
Applications	Available applications
GPS Firmware	GPS firmware version used by MAX
Glonass State	State of GLONASS subscription, where value is one of the following: • Enabled (valid subscription entered in MAX) • Disabled (no subscription entered)
Serial Number	Serial number of the receiver. Also appears in the Subscriptions window—see “Viewing and Entering Subscription Information” on page 23 for more information
Active	Active application (see Applications field for available applications)
Bootloader	Current boot loader version (used to update the firmware)
GNSS Out	Shows if outputting GPS and GLONASS information in NMEA messages
Active Mode	User-selected correction type—see “Correction Type” on page 21 for more information
Fleet	*For troubleshooting purposes only, as directed by Outback Guidance Customer Service.*
HW Version	Hardware version of receiver
Production Date	Manufacturing date of receiver

Table A-2: Receiver Status screen fields *(continued)*

Field	Description
Diff Age	Age of the corrections used in the DGPS calculation. Values > 120 seconds require acquiring a new RTK lock. For SBAS, the Diff Age is typically 6 to 10 seconds.
Subscriptions button	Press to display the Subscriptions screen—see “Viewing and Entering Subscription Information” on page 23 for more information

RTK Status

The RTK Status screen shows information related to your RTK subscription and functionality. The screen also shows different fields depending on the radio you have connected (see figures below).

To display the screen, press **Menu > Diagnostics > GPS > RTK Status**.

920 MHz radio connected

400 MHz radio connected

Table A-3 describes each field on the RTK Status screen.

Table A-3: RTK Status screen fields

Field	Description
Active Mode	User-selected correction type—see “Correction Type” on page 21 for more information
Base Latitude	Latitude of the base station in decimal degrees
Base Longitude	Longitude of the base station in decimal degrees
Base Altitude	Ellipsoidal height of the base station
Base Distance	Distance between base and rover
Heading to Base	Angle of heading to base station
Diff Age	Age of the corrections used in the DGPS calculation. Values > 120 seconds require acquiring a new RTK lock. For SBAS, the Diff Age is typically 6 to 10 seconds.
Station ID	Base station ID
Radio Type	Radio type in the rover receiver
RSSI	Received signal strength indicator - actual power in the received radio signal (in dBm)
Channel	*This field only appears if you have a 920 MHz radio connected.* Channel you entered when setting up your radio; it is the same channel you entered on your base station radio—see “Radio Link Settings” on page 27 for more information
Region Code	*This field only appears if you have a 920 MHz radio connected and is used for troubleshooting purposes only when directed by Outback Guidance Customer Service.*
Radio Frequency	*This field only appears if you have a 400 MHz radio connected.* Frequency you entered when setting up your radio; it is the same frequency you entered on your base station radio—see “Radio Link Settings” on page 27 for more information
Radio SN	Radio serial number

OmniSTAR Status

The OmniSTAR Status screen shows information related to your OmniSTAR subscription and functionality.

To display the screen, press **Menu > Diagnostics > GPS > OmniSTAR Status**.

Table A-4 describes each field on the OmniSTAR Status screen.

Table A-4: OmniSTAR Status screen fields

Field	Description
Version	OmniSTAR service library version
Subscription	OmniSTAR subscription
Expiration Date	Subscription expiration date
Tracking	OmniSTAR tracking status
Frequency	Frequency of OmniSTAR satellite
Satellite Longitude	Satellite location (longitude) that covers the area in which you will be working
Satellite Elevation	Elevation of OmniSTAR satellite
Satellite Azimuth	Azimuth of OmniSTAR satellite
BER	Bit error rate Relative strength of the correction satellite. The number can be from 0 to 500, with 0 being the best and 500 being the worst. If BER > 20 verify the antenna has a clear view of the sky to properly find and track correction satellites. For OmniSTAR the numbers before and after the hyphen will be the same.
Status	Current status level (possible values are FIX, FLT, DIF, AUT)
Correction Type	User-selected correction type—see “Correction Type” on page 21 for more information
Serial Number	GNSS serial number

Table A-4: OmniSTAR Status screen fields *(continued)*

Field	Description
Station ID	Pseudo base station ID for troubleshooting purposes.
Diff Age	Age of the corrections used in the DGPS calculation
OmniStar Tuning	Spot beam information for OmniSTAR satellite in use by the MAX receiver
Autoseed button	Set to On to have MAX automatically use the last known position to reduce HP/XP convergence time. Default is On. **WARNING:** *When Autoseed is On, there is a potential for position shifts if the vehicle is moved after shutting the unit off. The vehicle must remain in the same position with a clear view of the sky between the times of powering the unit Off and powering the unit back On. If this is not possible, it is recommended that Autoseed be turned Off.*

eDif Status

Extended Differential (e-Dif) software enables MAX to perform with differential-like accuracy for extended periods of time without the use of a differential service. e-Dif models the effects of ionosphere, troposphere, and timing errors for extended periods by computing its own set of pseudo-corrections. e-Dif may be used anywhere geographically and is especially useful where SBAS networks have not yet been installed, such as South America, Africa, Australia, and Asia.

The eDif Status screen shows information related to your e-Dif subscription and functionality. e-Dif has a reference point—in e-Dif mode you can save the point, navigate back to that point (distance counts down), and update the e-Dif solution with that point. See the procedures at the end of this topic for instructions.

To display the eDif Status screen, press **Menu > Diagnostics > GPS > eDif Status**.

Table A-5 describes each field on the eDif Status screen.

Table A-5: eDif Status screen fields

Field	Description
eDif Latitude	Latitude of the reference point in decimal degrees
eDif Longitude	Longitude of the reference point in decimal degrees
eDif Altitude	Ellipsoidal height of the reference point
eDif Distance	Distance from saved e-Dif point
Diff Age	Counter that starts (counts up) when an e-Dif solution is first computed
eDif Response	e-Dif status; possible values are: “OK” and “FAILED Not Enough Stable Satellite Tracks”
Station ID	Pseudo base station ID for troubleshooting purposes
Save Point button	Save a reference point
Update Point button	Update the e-Dif solution with that point

Selecting e-Dif as the Differential Correction Type

See “Correction Type” on page 21 for information on selecting e-Dif (or another source) as your correction type.

Initialization of e-Dif on Powerup

After powerup MAX must track GPS satellites for approximately 10 minutes before it can generate differential corrections. The vehicle must be stationary during this time and the antenna should have a clear view of the sky. When MAX has finished tracking, the eDif Response field displays “OK.”

To view e-Dif status information and verify e-Dif is working correctly:

1. Press **Menu > Diagnostics > GPS > eDif Status**. The eDif Status screen appears.
2. Confirm the eDif Response field displays “OK.”

Updating e-Dif

If a job is interrupted/suspended, for hours or days for example, you need to be able to restart the job at the point (exact location) at which it was suspended. In e-Dif you can return to the point and update e-Dif. You record (and physically mark as a backup) the point at which the job is suspended. When you are ready to resume the job, use MAX guidance to return to that point (which you can confirm with a physical marker) and at that point, you update the e-Dif correction and resume guidance.

1. At the point at which the job is suspended (where you stop your vehicle and turn Apply Off):
   a. Press **Menu > Diagnostics > GPS > eDif Status** to display the eDif Status screen.
   b. Press **Save Point**. MAX records the vehicle’s exact location and the eDif Latitude and eDif Longitude fields show this location.
   c. **Place a physical marker at the exact location.**
2. Close the job (the job is saved)—see “Closing a Job” on page 111 for instructions.
3. When you are ready, load the job—see “Loading a Previous Job” on page 107 for instructions.
4. Select the Last Apply point—see “Returning to a Point” on page 136. MAX guides you back to the point where it last logged any job data. Since it is important to return to the exact physical location, you should use MAX guidance **and** your physical marker to return to that exact location.
5. When you reach the return point, stop the vehicle and confirm MAX is not logging data.
6. Press **Menu > Diagnostics > GPS > eDif Status** to display the eDif Status screen, then press **Update Point**. MAX resets the e-Dif correction.
7. Resume guidance.

Terminal Diagnostics

The Terminal Diagnostics screen displays such information as software version, current work profile (implement, vehicle, job), and status details for optional Outback ConnX functionality.

To display the Terminal Diagnostics screen, press **Menu > Diagnostics > Terminal Diagnostics**.

Table A-6 describes each field on the Terminal Diagnostics screen.

Table A-6: Terminal Diagnostics screen fields

Field	Description
Software Version	MAX software version
IP Address	External network IP address
IP Internal	Modem internal IP address
Refresh IP Addresses button	Updates the IP addresses
Current Profiles	
Implement	Currently loaded implement (also appears on the Current Implement button when you press Menu > Implement Profiles).
Vehicle	Currently loaded vehicle (also appears on the Current Vehicle button when you press Menu > Vehicle Profiles).
Job	Currently loaded job (also appears on the Indicator tab or on the Current Job button when you press Menu > Jobs).
Job Information	
Field Area	Field size for the job (also appears on the Indicator tab)
Worked Area	Area of job worked so far (also appears on the Indicator tab)
ConnX	

Table A-6: Terminal Diagnostics screen fields *(continued)*

Field	Description
Online status	Current connection status of ConnX. Possible values are: • ConnX • AgJunction • Unreachable
Display ID	Unique Terminal ID for use with ConnX subscriptions
Tracker State	Position Tracking socket state. Possible values are: • OK • Get address info error • Local file not found • No such node or service • Remote file not found • Socket connection error • Socket is dead • Socket overflow • Socket read error • Socket select error • Unknown error
Tracker Status	Current connection status of ConnX position tracking. Possible values are: • Connection success • Connection failed • Disconnected • Unknown State
Tracker Packets	Real-time count of packets being sent to the ConnX server. Updates every 60 sec (when connected).
Copy Logs button	Copies MAX debug files to a USB drive (button is enabled when you insert a USB drive in the terminal). When you press the enabled Copy Logs button the Terminal Diagnostics screen closes and an Exporting Logs progress window appears.
Backup Data button	Copies terminal data (such as profiles, jobs, and user configurations/settings) to a USB drive *Note: The Backup Data and Restore Data buttons are enabled when you insert a USB drive in the terminal—see "Backing Up and Restoring Data" on page 46 for more information.*
Last Backup	Date of backup on USB drive
Restore Data button	Copies backed up data from USB drive to the terminal

Updating Terminal Software

You can update the Outback MAX terminal software directly from the terminal in two ways:

- Using a USB drive that contains the software update (first procedure below)
- Over a network connection via Wi-Fi (second procedure below)—MAX automatically searches an Outback server for updated software

Note: You must be connected to a network to use Wi-Fi software update feature—see "Networking" on page 31 for information on connecting to a wireless network.

To update MAX terminal software via USB drive:

1. Download the software update from the Outback website and save the .ota file to a USB drive (such as the USB that was included in your MAX kit).
2. Insert the USB drive (containing the software update) into a USB port on the MAX terminal.
3. Press **Menu > Diagnostics > Software Update**. The Update Software screen appears showing the current terminal software version and the available update version on the USB drive. You may need to press **Check for Updates** to display the available version.

4. Press **Install Update**. MAX displays several messages during this process until the following message appears.

5. Remove the USB drive then power cycle the MAX terminal (following the onscreen instructions when required) to complete the software update.

To update MAX terminal software via Wi-Fi:

1. Verify you are connected to the internet (see "Networking" on page 31).
2. Press **Menu > Diagnostics > Software Update**. The Update Software screen appears showing the following:
   - Current terminal software version

- Terminal software version available for download, preceded by "web" this is the version MAX located on the Outback server (you do not need to manually search for the server, since MAX does this automatically)
- Size of the download

If no update is available the Download Size field and Download Update button do not appear and the Available Update Version field displays "none available".

3. Press **Download Updates**. The download begins with the following message:

When the download is complete the message closes and the Install Update button appears.

Note: Pressing Stop cancels the download (you cannot resume a canceled download).

4. Press **Install Update**. Several messages may appear during the software download. When the download is complete the following message appears:

5. Power cycle the MAX terminal (following the onscreen instructions when required) to complete the software update.

eDriveX

The eDriveX panel provides access to eDriveX status and diagnostic information. The eDriveX panel is available only if eDriveX is communicating with the terminal—that is, eDriveX is connected to the terminal and powered on—thus, the eDriveX button appears on the Diagnostics panel when you press Menu > Diagnostics.

Note: The button below Steer Test depends on the valve type you select for your vehicle. If you select a Plus+1 valve type, the PlusOne button appears (near right); if you select ESi as the valve type, the ESi Diagnostics button appears (far right).

To display the eDriveX panel, press **Menu > Diagnostics > eDriveX**.

As shown at right, the Service and Steer Test buttons are disabled when you are engaged on a guideline.

eDriveX Status

The eDriveX Status screen shows the hardware, calibration, and run time status of the eDriveX system.

To display the eDriveX Status screen, press **Menu > Diagnostics > eDriveX > Status**.

While most of the items on this screen appear regardless of the vehicle and valve types selected, some items are determined by your vehicle and valve types or subscriptions, such as:

- eDriveX Status: Valve Online (hydraulic) or Electric Steer (ESi)
- Calibration Status: Coarse WAS, Minimum Current, P-Gain, Fine WAS (hydraulic) or Steering Ratio (ESi)
- Calibration Status: eTurns appears only with a valid eTurns subscription

The eDriveX Status screen below is for an ESi setup.

The following status indicators can appear to the left of each status item:

- Green check - OK (no issue)
- Red exclamation point - error or limitation, such as a part of the system is not ready for guidance/autosteering (ex: Filters Converged not OK) or some aspect of user setup is incomplete (such as one of the calibration steps is incomplete)
- Yellow triangle with exclamation point - this applies only to the Software status item when eDriveX software is not compatible (incorrect version)
- Help button - this applies only to the Software and the Filter Converged status items - press the Help button for instructions to resolve the issue

The examples below show (left) status indicators and (right) text to resolve an error.

Status indicators

Text to resolve an error

A flashing alert also shows on the Steering button so you can see that there are 'system not ready' alerts even if you are not viewing the eDriveX Status screen.

Table A-7 through Table A-9 provide information on status alerts on the eDriveX Status screen. If the recommended action does not resolve the issue, contact Outback Guidance Customer Service.

Table A-7: eDriveX Status screen hardware status alerts

Item	Reason(s)	Action(s) as Applicable
ECU Power	This will never show an alert as you cannot access this screen if eDriveX has no power.	
ECU Ready	This will never show an alert as you cannot access this screen if eDriveX is not ready (autosteer criteria not met).	
ECU Hardware	CPU load (alert shows only on startup).	
	High CPU usage.	Wait for two minutes, power cycle eDriveX.
	Low free memory.	Cycle power to eDriveX.
Valve Online	Out of range (current WAS position is outside calibrated values).	Power cycle steering controller. Recalibrate WAS.
	Short/Open circuit.	Check WAS harness connections for damaged wires/pins.
	Open/short circuit on one or more of solenoid lines.	Power cycle steering controller.
	Current (mA) fault (not achieving the required current - check current and voltage rating on coils).	Check solenoid harness for broken or damaged wires/pins. Review WAS troubleshooting.
	WAS fault.	
Electric Steer (Only shown for ESi vehicles)	ESi not ready or not aligned.	Turn the wheel to align.
DMU Sensor	Roll/Pitch out of range because ECU orientation not set correctly.	Power cycle eDriveX. Recalibrate ECU orientation.
	Failed DMU sensor.	
GPS Sensor	Comms problem with GPS sensor (power problem).	Power cycle eDriveX.
	Failed GPS sensor.	
CAN Data	Green check mark indicates terminal correctly talking to eDriveX (no dropped messages)—sync button appears if bad (in error).	
Software	MAX and eDriveX software versions are incompatible.	Update eDriveX software per Help button message.

Table A-8: eDriveX Status screen calibration status alerts

Item	Reason for Alert/Action
For all fields	Value not set; check calibration and set correct values.

Table A-9: eDriveX Status screen run time status alerts

Item	Reason for Alert/Action
Steer Override: Inactive	Should be not active unless the steering wheel is being turned. If active when steering wheel not being turned, problem with override system is indicated. Power cycle the system, check alert state.
Wayline	Wayline not set. Select job/template or create new A=B line.
Filters Converged	Perform filter converging process (a Help button appears next to this field when you need to take action; press the Help button and follow the instructions)—see “Manual Driving Sequence” on page 62 for more information on manually converging filters.
Ready to Engage	Not all Hardware and Run Time items are green (OK). Review items (with red exclamation point) using above tables.
Position Estimated	Incorrect configuration. Check ECU orientation and drive machine for a few minutes above 4 kph.

eDriveX Diagnostics

The eDriveX Diagnostics screen shows the current firmware version of eDriveX and measurable details of the eDriveX system.

To display the eDriveX Diagnostics screen, press **Menu > Diagnostics > eDriveX > Diagnostics**.

For both a hydraulic setup (first figure below) and an ESi setup (second figure below) most of the fields on this screen are the same except that on the screen for an ESi setup there is no Wheel Angle field.

Hydraulic setup

ESi setup

Table A-10 describes each field on the eDriveX Diagnostics screen.

Table A-10: eDriveX Diagnostics screen fields

Field	Description
Firmware	Current Version: Current eDriveX firmware version Upgrade Version: If you insert a USB drive (containing upgrade firmware) into the eDriveX ECU the firmware version appears in this field ECU Log Number: Number associated with current data being logged
Vehicle Profile	Vehicle Type: Value (for the currently loaded vehicle) entered on Vehicle Dimensions screen Valve Type: Value (for the currently loaded vehicle) entered on Vehicle Dimensions screen See “Adding a Vehicle” on page 67 for information on vehicle type and valve type.
Vehicle Dimensions	Wheelbase / Front Hitch Length / Rear Hitch Length: Values entered on Vehicle Dimensions screen See “Adding a Vehicle” on page 67 for information on vehicle dimensions.
Antenna Location	Lateral Offset: Value from Antenna L/R Offset field Longitudinal Offset: Value from Antenna Pivot field Height: Value from Antenna Height field *All three values are from the Vehicle Dimensions screen* See “Adding a Vehicle” on page 67 for information on vehicle dimensions.
GPS Heading	Raw: Heading from GPS Adjusted: Corrected heading from filters Vehicle Direction: Direction of the currently loaded vehicle
Sensor Readings	Wheel Angle: Value the wheel angle sensor provides to the ECU at the time Roll: How much the system is leaning sideways (in degrees) Pitch: How much the system is leaning forward/rearward (in degrees)
Disengage Reason	Last: Reason for the most recent instance of autosteering being disengaged

eDriveX Vehicle Calibration Summary

The eDriveX Vehicle Calibration Summary screen displays eDriveX vehicle calibration results. Depending on the autosteering component installed (eDriveXC or eDriveXD) this screen may look different than below. However, all possible fields are described in the table on the next page.

To display the eDriveX Vehicle Calibration Summary screen, press Menu > Diagnostics > eDriveX > Vehicle Calibration Summary.

The eDriveX Calibration Summary screen displays eDriveX calibration results.

To display the screen, press **Menu > Diagnostics > eDriveX > Calibration Summary**.

While many of the fields on this screen appear regardless of the vehicle and valve types selected, some items are determined by your vehicle and valve types or subscriptions, such as:

- Wheel Angle Sensor, Current, and P-Gain (hydraulic) - see figure above
- Steering Ratio (ESi) - see figure on next page
- eTurns Min Radius (appears only with a valid eTurns subscription) - see figures above and on next page

The eDriveX Calibration Summary screen below is for an ESi setup.

See “Vehicle Calibration Considerations” on page 59 for calibration prerequisites and considerations and see “Adding a Vehicle” on page 67 for the actual calibration steps when adding a vehicle.

Table A-11 describes each field on the eDriveX Calibration Summary screen.

Table A-11: eDriveX Calibration Summary screen fields

Field	Description
Mount Orientation	Top: ECU top orientation Connector: ECU connector orientation
Wheel Angle Sensor (WAS)	Left: WAS count at left lock Right: WAS count at right lock Center: WAS count at center
Min Radius	Left: Turning circle of the vehicle when turning left Right: Turning circle of the vehicle when turning right
Lateral Acceleration	eTurns will be limited to the calibrated maximum g-force
Current	Left: Minimum and maximum currents left for steering valve Right: Minimum and maximum currents right for steering valve
Steering Ratio (ESi only)	Ratio of wheel turn to vehicle turn
Lock to Lock Time	Left to Right: Lock-to-lock time going left to right Right to Left: Lock-to-lock time going right to left
P-Gain	Wheel steering gain
Mount Bias	Roll: Roll mounting bias of the ECU Pitch: Pitch mounting bias of the ECU

eDriveX Implement Calibration Summary

The eDriveX Implement Calibration Summary screen displays eDriveX implement calibration results.

To display the screen, press **Menu > Diagnostics > eDriveX > Implement Calibration Summary**.

See “eTurns” on page 156 for information on eDriveX implement calibration.

The following table describes each field on the eDriveX Implement Calibration Summary screen.

Table A-12: eDriveX Implement Calibration Summary screen fields

Field	Description
eTurns Min Radius	Left: Turning circle (turning left) of the vehicle with the implement attached Right: Turning circle (turning right) of the vehicle with the implement attached

eDriveX Service

The eDriveX Service screen displays the currently installed eDriveX ECU firmware version (as well as an upgrade version) and the ECU log number (for logging ECU data). You can use the buttons on the screen to upgrade the ECU firmware and copy ECU log files to a USB drive.

To display the screen, press **Menu > Diagnostics > eDriveX > Service**.

For both a Plus+1 valve type setup (first screen below) and an ESi valve type setup (second screen below) the fields on this screen are the same—except the screen for an ESi setup also includes ESi Firmware fields.

Table A-13 describes each field on the eDriveX Service screen.

Table A-13: eDriveX Service screen fields

Field	Description
eDriveX Firmware	Current Version: Current eDriveX firmware version Upgrade Version: If you insert a USB drive (containing upgrade firmware) into the eDriveX ECU the firmware version appears in this field and the Upgrade button is enabled along with a button to install the upgrade version. Upgrade button: Enabled when you insert a USB drive (containing upgrade firmware) into the eDriveX ECU
ESi Firmware (Only shown for ESi vehicles)	Current Version: Current ESi firmware version Upgrade Version: Available upgrade version of ESi firmware. You do not download this firmware separately; it is part of the eDriveX ECU firmware package. Upgrade button: Enabled when current or newer version is available.
Log Extraction	ECU Log Number: Number associated with current data being logged Copy Logs button: Allows you to copy (export) eDriveX log files to a USB drive. This button is enabled only after you insert a USB drive in the eDriveX ECU USB port.

ESi Diagnostics and Status

The ESi Diagnostics and Status screen displays measurable details of the ESi system and hardware and run time status information.

Note: You can display this screen only if you selected ESi as the valve type for your vehicle.

To display the screen, press **Menu > Diagnostics > eDriveX > ESi Diagnostics**.

The following status indicators can appear to the left of each Hardware and Run Time status item:

- Green check - OK (working properly)
- Red exclamation point - error

The following table describes each field on the ESi Diagnostics and Status screen.

Table A-14: ESi Diagnostics and Status screen fields

Field	Description
Identification	Firmware Version: ESi firmware version. Serial Number: ESi serial number. Mode: Mode of operation; displays ‘Normal’ when ESi is functioning properly. If a value other than 'Normal' appears, contact Outback Guidance Customer Service or your local dealer.
Metrics	CPU Load: ESi CPU peak load % Temperature: ESi motor temperature Up Time: Total cumulative time the ESi has been powered

Table A-14: ESi Diagnostics and Status screen fields *(continued)*

Field	Description
Hardware and Run Time status	All items will have a green check when the system is operating properly. If an item has a red exclamation mark, an error is indicated contact Outback Guidance Customer Service or your local dealer. *Note: The Aligned (Hardware) item will have a red exclamation point under any of the following conditions until you turn the wheel slightly: ESi is first powered on, eDriveX is rebooted, or valve type is changed to ESi.*

PlusOne Diagnostics

The PlusOne Diagnostics screen displays PlusOne steering controller information.

Note: You can display this screen only if you selected a Plus+1 valve type for your vehicle.

To display the screen, press **Menu > Diagnostics > eDriveX > PlusOne**.

The following table describes each field on the PlusOne Diagnostics screen.

Table A-15: PlusOne Diagnostics screen fields

Field	Description
Firmware	PlusOne steering controller firmware version

Rate Section Control Diagnostics

The Rate Section Control Diagnostics screen displays such information as software version and flow rate. The information displayed on this screen depends on whether you are set up for liquid operation or dry operation (as shown below).

To display the screen, press **Menu > Diagnostics > Rate Section Diagnostics**.

Liquid operation

Dry operation

Table A-16 describes each field on the Rate Section Control Diagnostics screen.

Table A-16: Rate Section Control Diagnostics screen fields

Field	Liquid	Dry	Description
Version	X	X	Rate/section control (AC110) software version.
Accumulated Volume	X	X	Total volume sprayed since last reset (increases with time) you reset this value between jobs or for other longer term calculations.
Clear Volume button	X	X	Reset the Accumulated Volume.
Boot Loader button	X	X	Update rate/section control (AC110) software—see procedure following this table.
Flow	X	X	Current flow rate
Pressure 1 Pressure 2	X X		Pressure 1 value Pressure 2 value See “Calibrating Rate Control” on page 185 for more information on how this value relates to calibrating your rate control.
LowFlow Setting	X		Current LowFlow value (manually entered) See “Configuring Your Implement for Rate Control” on page 174 for more information.
Spinner Speed		X	Actual spinner speed
Meter Calibration		X	Displays the value from the Meter Calibration field when calibrating your conveyor See “Calibrating Rate Control” on page 185 for more information.
Meter Calibration Adjusted		X	Actual meter value based on adjustments to the following values: Density Calibration Gate Height Volume Calibration See “Calibrating Rate Control” on page 185 for more information.
Power Duty Cycle Conveyor		X	These fields are for troubleshooting purposes only when directed by Outback Guidance Customer Service.
Raw Frequency Conveyor		X	
Power Duty Cycle Spinner		X	
Raw Frequency Spinner		X	

To load AC110 software (using the Boot Loader button):

1. Make sure the AC110 files are in a folder named ‘ac110’ that is at the root level of a USB drive.
2. Plug the USB drive into the MAX terminal.
3. Press **Menu > Diagnostics > Rate Section Diagnostics > Boot Loader**. A “Loading New Bootloader” message appears, then when the loading process is complete (after a few minutes) a success message appears.
4. Press **Ok**. The Version field is updated.

ISO VT Diagnostics

The ISO VT Diagnostics screen lists all ECUs on the CAN bus. Selecting an ECU in the list displays diagnostic information for that ECU. For more information on the ISO VT see “ISO VT” on page 43 and “ISOBUS Settings” on page 37.

Note: You should only need to refer to this screen when directed by Outback Customer Service.

To display the screen, press either of the following:

- **Menu > Diagnostics > VT Diagnostics**
- **Menu > Settings > ISOBUS Settings > Diagnostics**

When you select an item in the list a details window appears for that item (ECU) as shown below.

Press **Close** to close the details window (and show the list of ECUs). If you do not close this window the next time you display the ISO VT Diagnostics screen this window will still be visible.

Note: Pressing Trouble Codes displays a list of error codes the ECU is reporting. Contact your ISOBUS implement manufacturer or dealer for more information.

Table A-17 describes each field on the ISO VT Diagnostics details screen.

Table A-17: ISO VT Diagnostics screen fields

Field	Description
Part Number	ISO VT part number
Serial Number	ISO VT serial number
Hardware Version	ISO VT hardware version
Manufacturer	ISO VT manufacturer
Location	ISO VT location
Type	ISO VT type
Functionality	ISO VT functions/tasks
Software ID	ISO VT model ISO VT software version ISO VT server version Task Controller version

High Speed Logging

The High Speed Logging button enables you to record GPS data to a USB drive for troubleshooting purposes when directed by Outback Guidance Customer Service.

To record GPS data:

1. Insert a USB drive into the side USB port on the MAX terminal.
2. Press **Menu > Diagnostics**. The Diagnostics panel appears (shown at right) and the High Speed Logging button is enabled. The default setting for this button is Off.
3. Press **High Speed Logging** to set the button to On. The button turns green and MAX begins recording GPS data.

4. When you are finished recording data press **High Speed Logging** to set the button to Off. The button is briefly disabled as it finishes writing GPS data to the USB drive.

Task Controller Status

The ISO ECU Status screen shows the following information for the currently connected ISOBUS-enabled implement ECU:

- Rate and section controller configuration status
- Active job totals

Note: Active job total values are determined by the implement contact your implement manufacturer for more information.

Tip! *Before using the ISO ECU Status screen to troubleshoot an ISOBUS issue you should first verify objects pools have been loaded see* *"ISOBUS Settings" on page 37* *for more information.*

To display the ISO ECU Status screen, press **Menu > Diagnostics > Task Controller Status**.

The following status indicators can appear to the left of each status item:

- Green check - OK (no issue)
- Red exclamation - error or limitation (such as a section controller not in AUTO mode)
- Yellow triangle with exclamation - information that should be addressed but is not an error
- Edit button - displays the appropriate panel/screen from which you can resolve an issue

The two figures below show examples of each type of status indicator:

The following two tables provide information on status alerts on the ISO ECU Status screen. If the recommended action does not resolve the issue contact Outback Guidance Customer Service.

Table A-18: Status Alerts - Rate Controller

Item	Error Display	Action(s) as Applicable
Rate Controller Selected		Select an ISO ECU rate controller: • Press **Menu > Implement Profiles > Current Implement > Rate Control Settings > Controller Type** then select the appropriate controller See “Configuring Your Implement for Rate Control” on page 174 for more information on rate control settings (including controller type).
Conveyor Rate Controller Selected		Select an ISO ECU rate controller: • Press **Menu > Implement Profiles > Current Implement > Conveyor Control Settings > Controller Type** then select the appropriate controller See “Configuring Your Implement for Rate Control” on page 174 for more information on rate control settings (including rate controller type).

Table A-18: Status Alerts - Rate Controller *(continued)*

Item	Error Display	Action(s) as Applicable
Spinner Rate Controller Selected		Select an ISO ECU rate controller: • Press **Menu > Implement Profiles > Current Implement > Spinner Control Settings > Controller Type** then select the appropriate controller See “Configuring Your Implement for Rate Control” on page 174 for more information on rate control settings (including spinner controller type).
Selected Rate Controller Found Selected Conveyor Controller Found Selected Spinner Controller Found		Ensure the current implement is set up and connected to the ISOBUS.
Rate Controller in AUTO Conveyor Controller in AUTO Spinner Controller in AUTO		Ensure the current implement is configured for operation with the Task Controller (you may need to enable this functionality through ISO VT). See “ISO VT” on page 43 for more information ISO VT.
ISO Implement Profile Needs Save		Save the Implement Profile • Press **Edit > Save** or Press **Menu > Implement Profiles > Current Implement > Save** Items you may need to save include: • Rate On Look Ahead Time • Section On Time • Section Off Time • Number of Sections • Section Location/Widths • Implement Config Offset (front/back) • Implement Config Offset (left/right) Example:

Table A-18: Status Alerts - Rate Controller *(continued)*

Item	Error Display	Action(s) as Applicable
Unselected Rate Controller Found		An ISO ECU was found that as has a Rate Controller function but it has not been selected in the Implement Profiles panel correcting this error is optional (it is merely alerting you that a connected rate controller is not selected) To select the appropriate controller: • Press **Menu > Implement Profiles > Current Implement > Rate Control Settings > Controller Type** then select the appropriate controller or Press **Menu > Implement Profiles > Current Implement > Conveyor Control Settings > Controller Type** then select the appropriate controller or Press **Menu > Implement Profiles > Current Implement > Spinner Control Settings > Controller Type** then select the appropriate controller See “Configuring Your Implement for Rate Control” on page 174 for more information on rate control settings (including controller type).

Table A-19: Status Alerts - Section Controller

Item	Error Display	Action(s) as Applicable
ISO Section Controller Selected		Select an ISO ECU section controller: • Press **Menu > Implement Profiles > Current Implement > Section Control > Controller Type** then select the appropriate controller See “Setting Up Section Control” on page 203 for more information on section control settings (including controller type).
Selected Section Controller Found		Ensure the current implement is set up and connected to the ISOBUS.
Section Controller in AUTO		Ensure the current implement is configured for operation with the Task Controller (you may need to enable this functionality through ISO VT). See “ISO VT” on page 43 for more information on ISO VT.

Table A-19: Status Alerts - Section Controller *(continued)*

Item	Error Display	Action(s) as Applicable
Valid Section Geometry		Implement is reporting an unsupported section configuration, where possible causes may be: • Sections are not configured in a single row at a common distance from tractor • Gaps or overlaps exist between sections Ensure the implement is configured correctly in through ISO VT. See “ISO VT” on page 43 for more information on ISO VT.
Valid Section On/Off Time		Implement is not reporting the same Section On/Off Times for all sections Configure the implement to report the same value for each section: • Press **Menu > Implement Profiles > Current Implement > Rate Control Settings > Controller Type** then select the appropriate controller See “Setting Up Section Control” on page 203 for more information on section control settings (including on time and off time).
Unselected Section Controller Found		An ISO ECU was found that as has a Section Controller function but it has not been selected in the Implement Profiles panel correcting this error is optional (it is merely alerting you that a connected section controller is not selected) To select the appropriate controller: • Press **Menu > Implement Profiles > Current Implement > Section Control > Controller Type** then select the appropriate controller See “Setting Up Section Control” on page 203 for more information on section control settings (including controller type).

Capturing Screen Images

If you notice something on the touchscreen that you either do not understand or want to save for later review you can take a screen capture of the entire display.

Insert a USB drive (with a “screenshots” folder at the root level) into the terminal and the Favorites button on the terminal (not the touchscreen button) functions as a screen capture tool.

See “Terminal Buttons” on page 4 for more information.

To capture screen images:

1. Create a "screenshots" folder on a USB drive (case does not matter...for example, "screenshots" and "Screenshots" are both acceptable).

2. Insert the USB drive in either USB port on the MAX terminal.
3. When MAX displays the screen you want to capture press the Favorites terminal button. MAX displays a screenshot message on the display (below) and saves a capture of the entire screen as a .png file in the screenshots folder on the USB drive.

4. When you view the contents of the USB drive the "screenshots" folder shows the screenshot filename (shown below) as that shown in the screenshot message (see previous step).

Appendix B: Frequently Asked Questions

About GPS Guidance

About Outback MAX

About GPS Guidance

Q: What is GPS?

A: Global Positioning System (GPS) is a satellite-based signal operated by the U.S. Department of Defense and is available to anyone to provide position information to receivers on the ground. Several satellites are used by the receiver to pinpoint the exact position.

Q: What is DGPS?

A: DGPS stands for differential GPS (or differential correction GPS). It means that a second signal is used to correct inherent errors in the GPS signal making it even more precise. MAX can utilize SBAS, RTK, or L-band corrections.

Q: What is WAAS?

A: Wide Area Augmentation System (WAAS) is a satellite-based correction signal operated by the U.S. Federal Aviation Administration that is free to those who use it. WAAS provides relatively uniform accuracy and coverage from the Arctic Ocean to Hawaii to the mid-Caribbean to the mid-Atlantic and the shores of Greenland. Other SBAS systems, such as EGNOS (Europe) and MSAS (Japan), offer corrections in other areas of the world. For more information about WAAS go to http://gps.faa.gov/.

Q: How accurate is MAX DGPS?

A: Using SBAS corrections and operating under normal conditions (where each subsequent pass is being made within minutes of the last), swath to swath accuracy is just a few inches. The more time elapsed from one pass to the next may reduce accuracy.

Q: What about foam markers and disk markers?

A: The answer is … use them if they help. The best guidance is what works for you. The more visual indicators to guide from the better; however, GPS guidance will be the primary guidance means and everything else will be secondary.

Q: Can I plant using GPS guidance?

A: GPS guidance is a great planting aid, especially for making the straightest rows possible. Outback Guidance recommends differential GPS (like RTK) to provide you with every possible advantage.

Q: How does weather affect the GPS signal?

A: Rain, sleet, snow, thunderstorms, and wind normally do not affect the GPS signal. Lightning is not a problem unless it is a close strike—direct lightning strikes will damage MAX. Snow and ice accumulation on the antenna may also cause problems.

Q: How do power transmission lines affect the GPS signal?

A: Normally, high voltage power transmission lines do not affect the GPS signal at all.

About Outback MAX

Q: Can I use MAX as a receiver for other uses?

A: Yes. MAX accommodates NMEA 0183 serial and NMEA 2000 CAN communication protocols. Contact your Outback Guidance dealer for the latest compatibility list.

Q: How long does it take MAX to obtain a usable signal?

A: It normally takes 1 - 3 minutes. MAX first acquires the GPS signal ("3d" appears on the Indicator tab). Next, MAX acquires the DGPS correction ("3D" appears on the Indicator tab). For RTK corrections, it may take 15 minutes of consistent corrections to establish an RTK lock. The vehicle can be in motion during this process.

Q: Does MAX have memory?

A: MAX records all movement as long as guidance is on. When you pause a job using either the Run/Hold floor switch or the Apply button, no data is recorded. MAX can record up to 30 hours of data for a single job. When the job is finished, MAX automatically saves the job data. Historical data for each job is collected and stored on the system. You can import, export, or delete job data.

Q: How do I clear hard drive space?

A: To delete all job data press **Menu > Jobs > Delete Items > Delete Jobs** to display the Delete Jobs panel. Press **Select All** then press **Delete** to delete all jobs. You can also delete unused vehicles and implements (see "Deleting a Vehicle" on page 74 and "Deleting an Implement" on page 92).

Q: What is straight guidance?

A: In Straight guidance mode MAX generates straight, parallel lines. MAX locks on the closest line based on the first A=B pass and the entered swath width and then records the actual movement over those lines while guiding. You can generate a new A=B line at any time with MAX.

Q: What is pivot guidance?

A: Pivot guidance is similar to straight guidance except that you define the circumference of a circle rather than a straight line with A and B points.

Q: What is contour guidance?

A: In Contour guidance mode MAX records all movement as the vehicle moves around, unless you pause MAX using the Run/Hold floor switch or the Apply button. During the initial pass, no guidance is given. When you make a second pass and subsequent passes, MAX guides along the previous pass.

Q: Can I switch from straight guidance to contour guidance in one job?

A: You can switch back and forth between Straight guidance mode and Contour guidance mode, as needed. When MAX is in Contour guidance mode, it follows any pass (straight, circular, or contour) recorded in the current job.

Q: How do I perform headlands?

A: Press **Menu > Settings > System Preferences > Headland Alert** and select **On**. The headlands alert icon flashes and an audio alarm sounds anytime the current pass (swath width) crosses a previously applied area.

Q: How do I mark the A=B Line?

A: When performing straight passes, you define the initial pass by marking two points in the field. MAX generates a line through the two points defining the first pass. Since you can work passes in any order, you can define the A=B line along the edge of the field, down the middle of the field, or at any point in between. You define the A=B line in two ways: marking Point A at the beginning of the initial pass and marking Point B at the end **or** marking Point A at the beginning of the initial pass and entering a desired heading angle.

Q: Can MAX store a waypoint?

A: You can store a waypoint to guide back to that point. Waypoints are used primarily when a job is paused. For example, when stopping for a refill you would pause the job, save the point, and return back to that point to resume. MAX automatically records multiple points you can use as waypoints, including the last point any data was recorded. You can also drop a flag to mark a waypoint and MAX can guide to it.

Q: Does bright sunlight affect the display?

A: Day mode and Night mode make the screen easily viewable in any ambient light situation. You can also use the brightness buttons on the right side of the terminal to further adjust the display.

Q: How does MAX account for implement lag in turns?

A: MAX does not account for implement lag—it assumes turning lag will be approximately the same on each pass. As long as vehicle spacing is correct, implement spacing will follow. This also applies to side hills. Do not attempt to put the antenna on the implement to account for lag.

Q: What electrical power do I need for MAX?

A: The input voltage range is 10 to 36 VDC.

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