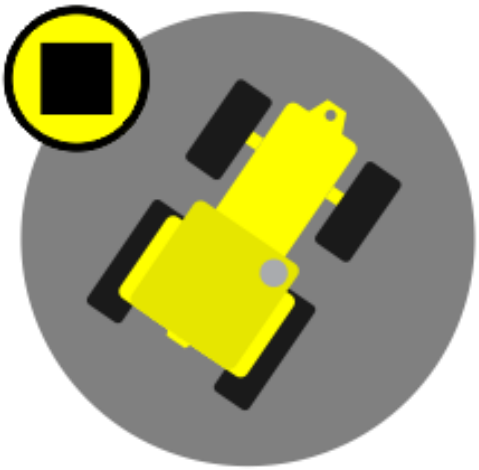


AgGuideV6

GPS GUIDANCE • AUTOSTEER • LAND LEVELLING • SPRAYING • VARIABLE RATE CONTROL

Operation Manual

PRECISION TECHNOLOGY

Important Safety Information.

Please read before continuing.

Improper operation, maintenance and repair of this product can be dangerous and could result in injury or death.

This manual is to be an additional guide that details the safe use instructions for the appropriate equipment fitted to this vehicle by Farmscan Ag and/or one of its dealers and is to be used in conjunction with the OEM operation manual supplied with the vehicle.

Safety precautions and warnings are provided in this manual and/or on the supplied equipment. Failure to heed these warnings may result in equipment damage, serious injury or death.

The warnings in this manual and/or on the equipment are, therefore, not all-inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by Farmscan* is used you must satisfy yourself that it is safe for you and for others.

Farmscan cannot anticipate every possible potentially hazardous situation. Please ensure that the supplied equipment will not be damaged or be made unsafe by the alternative operation, modification or repair procedures that you choose.

.

GENERAL INFORMATION

Throughout this manual the following symbols will be used to convey important information to the user.

Critical Safety Information.

This symbol will be used critical information when failure to follow the instructions may cause injury or death.

Important Information.

This symbol will be used when failure to follow the instructions may result in unexpected system behaviour or impact system performance.

General Information.

This indicates general information which is provided for the purpose of additional information.

TABLE OF CONTENTS

INTRODUCTION

Congratulations on your purchase of AgGuide V6. This manual covers the use of the for visual guidance, steering assist, spray control, GPS controlled land levelling or combinations of two or more of these options.

This manual and AgGuide application software can be used in conjunction with Farmscan Ag hydraulic steering kits and GPS systems of varying accuracies. This purchase will almost certainly include a ruggedized Windows based touch-screen computer (5900 PC are used for demonstration purposes in this manual), which will become the central component of your AgGuide system.

This manual will cover all of the essential topics regarding the setup, operation, adjustment and troubleshooting of your new system.

AgGuide V6 Options

GPS Guidance

AgGuide V6 can be used in conjunction with a suitable GPS receiver to provide visual guidance solutions to the user. When used in this mode only, auto-steer and spray control functions are not available.

Auto-steer or FlexiSteer™

AgGuide V6 can be used to assist in steering of the vehicle when used in conjunction with a suitable kit enabling secondary control over the steering. Once this option has been enabled, GPS guidance (as above) is automatically available.

Spray Control

AgGuide V6 can be used to automate various aspects of the spray applications. This includes full variable rate control of up to two parallel spray booms together with sectional boom control.

Variable Rate Control

AgGuide V6 can be used to automate various aspects of solid fertilizer and seed applications. This includes full variable rate control of up to three application bins.

Implement Steering

AgGuide V6 can be used to assist in steering of implements when used in conjunction with a suitable kit enabling control over the steering.

LevelGuide

AgGuide V6 can be used to assist in grading of fields using single plane or multi-plane cut-fill designs.

in grading of fields using single plane or multi-plane cut-fill designs.

Other Information

By selection of which of the above options are required at the time of purchase, you are able to use any or all of the above functionality to best suit your application.

Options can be enabled later by contacting your nearest sales representative.

GPS OVERVIEW

GPS (Global Position System) is a generic term used to refer to a system that uses satellite constellations that circle the earth to obtain a position on, or close to the earth's surface.

This manual is not meant to provide a comprehensive description of the operation of GPS systems, however a basic understanding will enable the user of the AgGuide V6 system to better understand and operate the system.

GPS Accuracy

GPS accuracy is a much-maligned term. Over recent years, many suppliers have supplied their own interpretation of the term, often to suit their commercial needs. Terms such as "Pass to Pass" accuracy may be relevant where only short term accuracy is required, however it is often misleading to the new user and so, for the purposes of this manual, we will refer to GPS accuracy as surveyors and other professional users of GPS do.

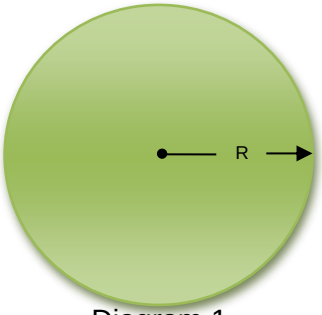


Diagram 1

GPS accuracy is traditionally split into three ranges. These are as follows

- Sub-meter (defined as accuracies less than a meter but greater than 15cm;
- 10cm (usually defined as accuracies between 10 and 15 cm this includes suppliers such as OmniSTAR HP & Terrastar-D);
- 2cm (also referred to as RTK)

To further understand GPS accuracy, substitute the value of accuracy that you require e.g. 10cm for the value shown as "R" in Diagram 1

The green circle represents the area in which your selected GPS will place you and still be within its design parameters regardless of time elapsed.

e.g. In the example shown above using 10cm accuracy, the GPS will conform within its designed accuracy provided that it gives a position within the 10cm (radius) 20cm (diameter) circle.

GPS Correction Signals

Standalone GPS, often referred to as autonomous GPS will only provide an accuracy (see above) of between 5 and 8 meters. For most applications using AgGuide V6, a better accuracy is required and therefore a correction signal is needed to enhance the autonomous or stand alone accuracy.

Correction signals traditionally take two (generic) forms:

1. Satellite or long distance land based stations (10cm to 1M accuracy) or
2. Local base stations (2cm to10cm accuracy)

Your supplier based on your requirements will make your selection of correction signal, however the following may assist in understanding your system further.

Correction using Satellite or long distance land based stations

These signals are sometimes available free of charge such as those provided in coastal Australia (sometimes called Marine Beacon signal), however traditionally in agricultural areas, it is necessary to subscribe to a commercial alternative requiring an annual subscription such as the OmniSTAR system or Terrastar. (Compatible hardware ONLY)

OmniSTAR & Terrastar offer both sub – meter (VBS) and 10cm (HP) correction signals and can be efficiently received in most agricultural areas within Australia and NZ.

Local base stations

Using a local base station enables high accuracy correction without the need for annual subscription. This must be offset by the capital cost of a base station. Traditional payback periods can vary between 2 and 7 years depending on selection criteria. This period can be further reduced by sharing a base station with neighbours as one base can service many vehicles (rovers)

If you have selected a GPS system that requires a base station, the base will be set up by a Farmscan Ag representative however some understanding of the system will ensure trouble free operation and also assist if adjustments are to be made under the supervision of Farmscan Ag.

The basic RTK GPS system consists of two parts - a GPS base station and the vehicle GPS (sometimes called a rover). It is essential that these components are setup correctly before configuring and operating AgGuide to ensure the best possible performance.

Base Stations (local)

There are two types of base station - **fixed** and **mobile**.

A fixed base station is typically located in a high position such as a shed roof or property pole that has access to mains power.

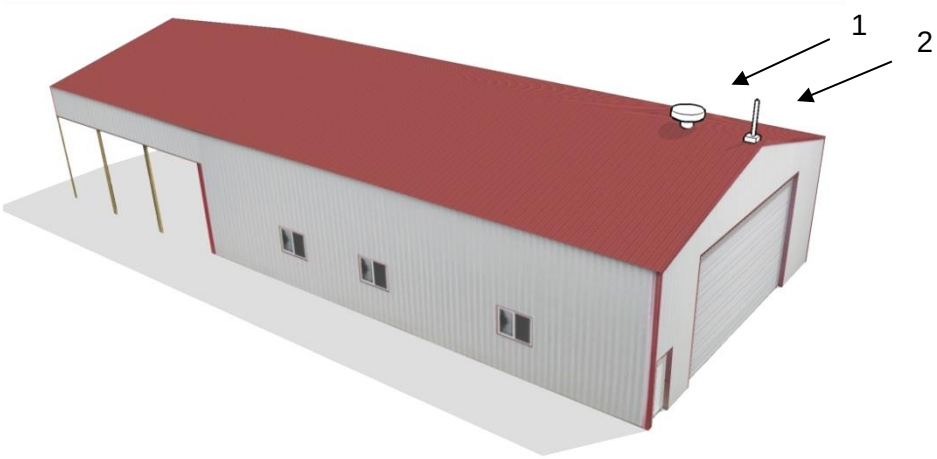
The base station GPS and base radio together with GPS antenna, radio aerial and cabling are housed in a heavy duty case. With the addition of a tripod and a mobile power source (12volt battery) your fixed base station can become mobile with minimal impact to your fixed base station setup.

Points to consider with fixed base stations:

1. Mounting the radio aerial as high as possible will get best possible performance
2. The GPS antenna must be mounted so that it has a clear 360° view of the horizon – any obstacles may create performance problems (e.g. black spots)
3. When using a 2 Watt UHF radio, mount the UHF radio aerial and GPS antenna at least 2 metres apart
4. When using a 35 Watt UHF radio, mount the UHF radio aerial and GPS antenna at least 5 metres apart
5. If the Base Station is to be used for Land levelling, the distance between Base and Rover should be limited to less than 5 km. Accuracy degrades with increasing distance from the Base.

Caution!

Do not apply power to the Base Station without being connected to an antenna as damage to the Base may result.



Typical fixed base station located on a shed roof, showing the GPS antenna (1) and the Radio aerial (2)

Base Stations (mobile)

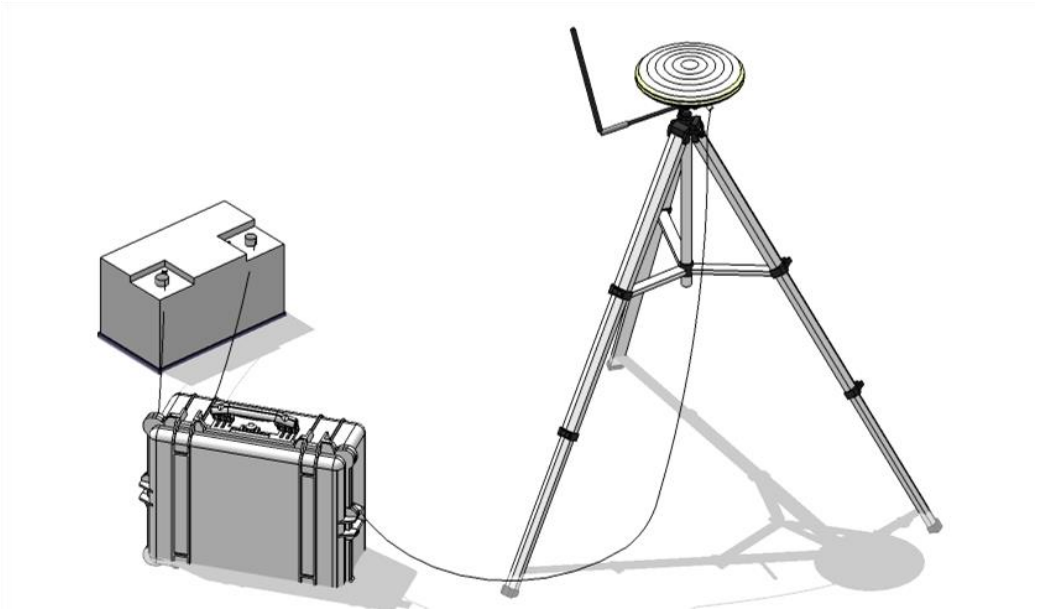
Contractors generally prefer a mobile base station as it allows them the freedom to move the base station from farm to farm.

The GPS antenna can be attached preferably to a tripod but a post or star-picket can be used as long as the GPS antenna is suitably secured.

Provided that the GPS antenna is returned to the exact position at a later time, accuracy will be maintained year after year.

If a mobile base station has been ordered it will have a radio of less than 4W capacity.

If the Base Station is to be used for Land levelling, the distance between Base and Rover should be limited to less than 5 Km. Accuracy problems occur as this distance increases.



Example of a mobile base station

Community Base Stations

Community base stations are collaborative fixed GPS base stations that are accessed by a group of farmers that work their properties in the same area. They are typically set up by a co-operative of private farmers to maximize GPS coverage and minimize cost.

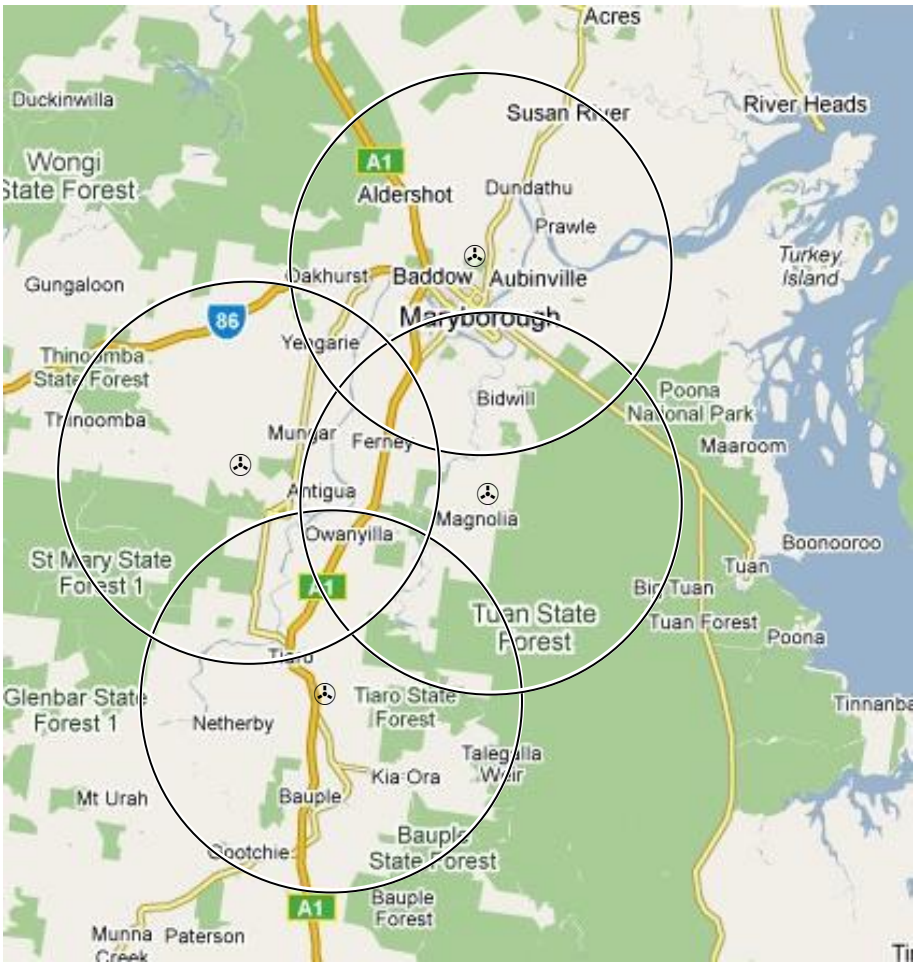
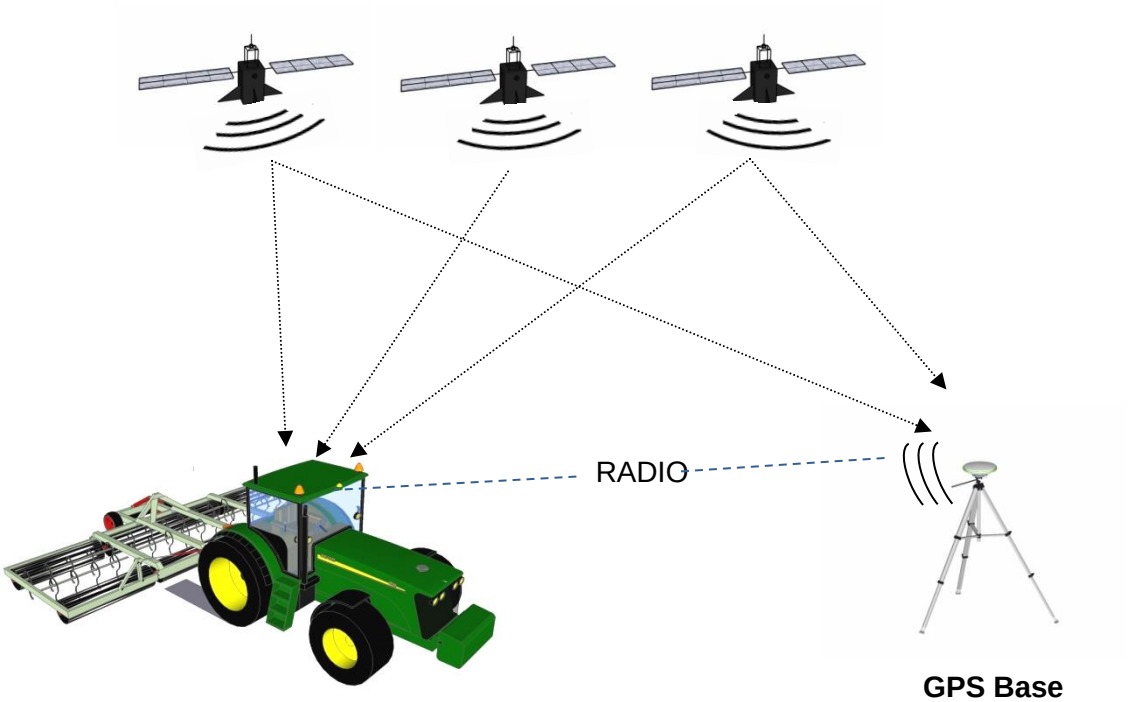


Figure 1: Example of community base station network coverage

Overview of Local base station operation



Satellites send GPS data that is received simultaneously by both the GPS in the vehicle and the GPS in the base station.

As the base station is fixed and has been given an accurate or calculated ‘fix’, the calculated variation (correction) from this position is transmitted via radio to the vehicle GPS which then calculates the corrected position of the vehicle.

Correction data is usually transmitted via radio once per second and the vehicle GPS uses this data to calculate the position of the vehicle every ⅕ th of a second (5Hz).

For land levelling, the implement GPS can be set to calculate the position of the implement blade every 1/10 th of a second (10Hz).

Base Station

The GPS base station provides the correction signal (see GPS Correction Signals above) to the GPS receiver in the vehicle.

Tractor GPS (Rover)

The Rover GPS receives the corrected signal information from the GPS Base Station via the base radio as shown in the diagram on the next page.

This then enables the Rover GPS to pinpoint the position according to the receivers' accuracy.

This positioning information is the used by the AgGuide software, to deliver the guidance, auto steer or spay control functions of the system.

AgGuide V6

This is the latest version of the Windows based software that controls your tractor and manages all of your customized farm specific data including farms, fields and boundaries.

It calculates and translates the GPS positioning data allowing you to enjoy the benefits of high accuracy steering and spray control.

Satellites send data that is received simultaneously by both the GPS in the vehicle and the GPS in the base station.

As the base station is fixed and has been given an accurate or calculated 'fix', the calculated variation (correction) from this position is transmitted via radio to the vehicle GPS which then calculates the corrected position of the vehicle.

Correction data is usually transmitted via radio once per second and the vehicle GPS uses this data to calculate the position of the vehicle every ⅕ th of a second (5Hz).

For land levelling, the implement GPS can be set to calculate the position of the implement blade every 1/10 th of a second (10Hz).

COMPONENTS OF THE SYSTEM

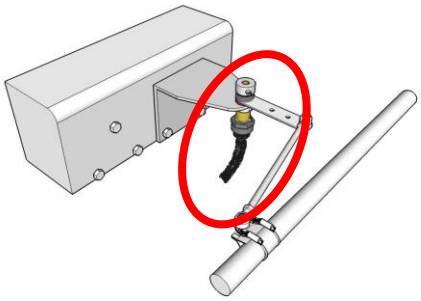
Display Terminals

The AgGuide V6 software requires a touch-screen Windows® based PC, which is generally included as part of your purchase. It is mounted in the cab of the vehicle during operation and can be moved between a fleet of vehicles as required.

Example of xPRO 5800 DLI tablet

Example of xLite 5700 tablet

Wheel Angle Sensor

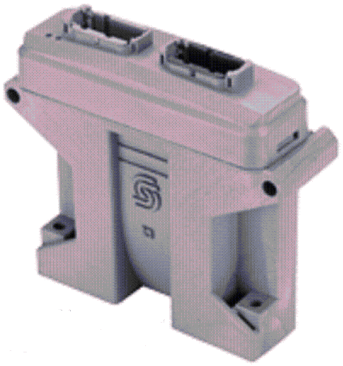


OR

The Wheel Angle sensor is an integral part of the auto steer system and will need to be both fitted and commissioned correctly for the system to operate.

Its prime job is to define accurately to the AgGuideV6 system, exactly where the wheels or articulation point of the vehicle is at any time. This feedback is critical to the effective operation of the system and periodic checks should be made to ensure it's correct calibration.

SD Module



The SD module provides the interface that enables the brains of the AgGuide system (PC and AgGuide software) to talk effectively with the remote components on the vehicle.

These components, such as Wheel Angle Sensor, Navigation Module (not fitted to all vehicles) provide information to the PC or others such as Hydraulic Control valves, accept control decisions from the PC via the SD module.

UniPOD

The Farmscan Ag UniPOD is the newest multipurpose and purpose built interface on the market today. The UniPOD can be pre programmed for Spray Control, Seeder Control, Spreader control, Steering & levelling control.

Hydraulics

For Hydraulic Steering and some implement control applications additional Hydraulic control valves may be fitted to the vehicle or implement. Valve components will be dependent on the Vehicle and implement type.

Nav Module

The Nav module is an integral component of the Steering system and provides sensor information regarding the vehicle movement including roll, pitch and yaw. This information is used to correct the GPS ground position.

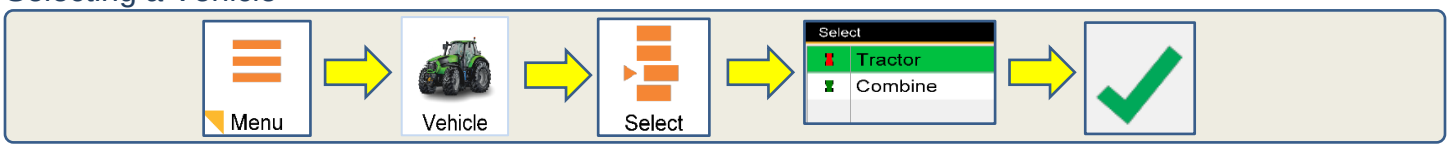
GPS Receiver

The GPS receiver provided the GPS position information to the system. When a correction solution is available , the GPS Receiver provides the corrected GPS data to the system.

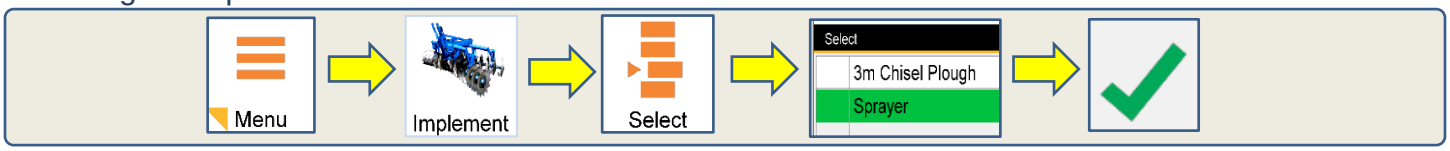
QUICK REFERENCE GUIDE

The following provides a quick reference for common tasks for operators who are familiar with AgGuide.

Selecting a Vehicle

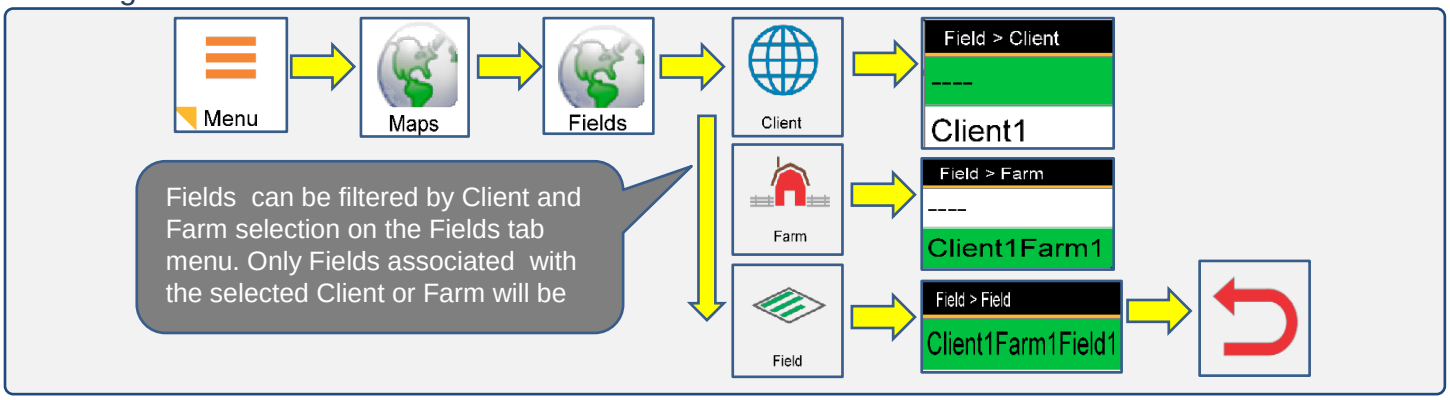


Selecting an Implement

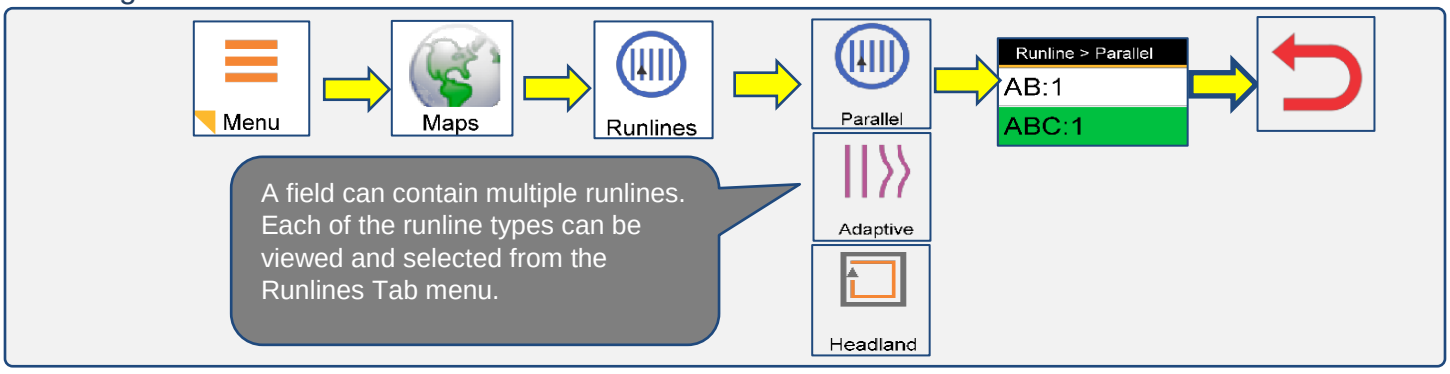


Selecting a Job

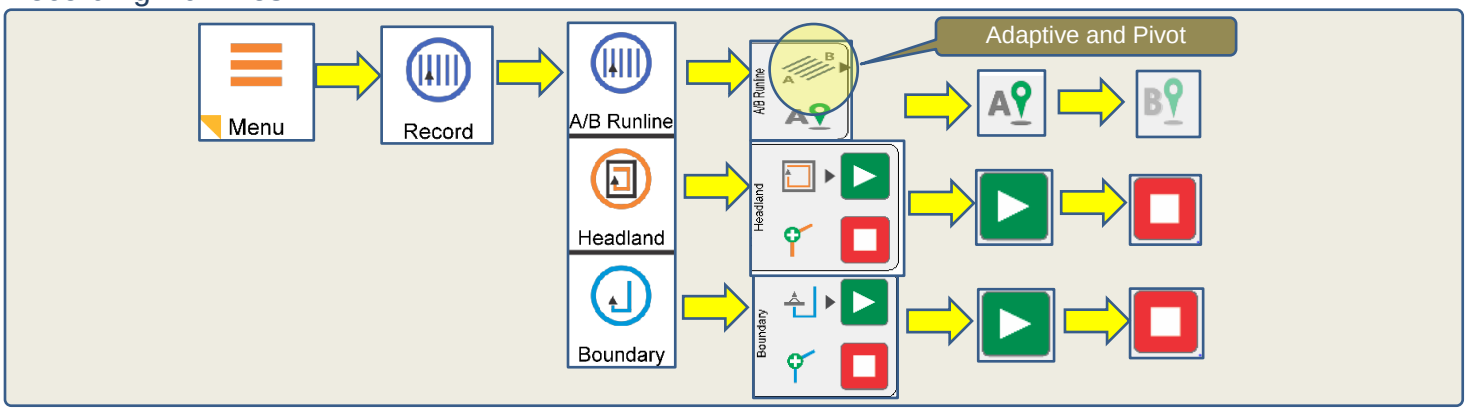
Selecting Fields



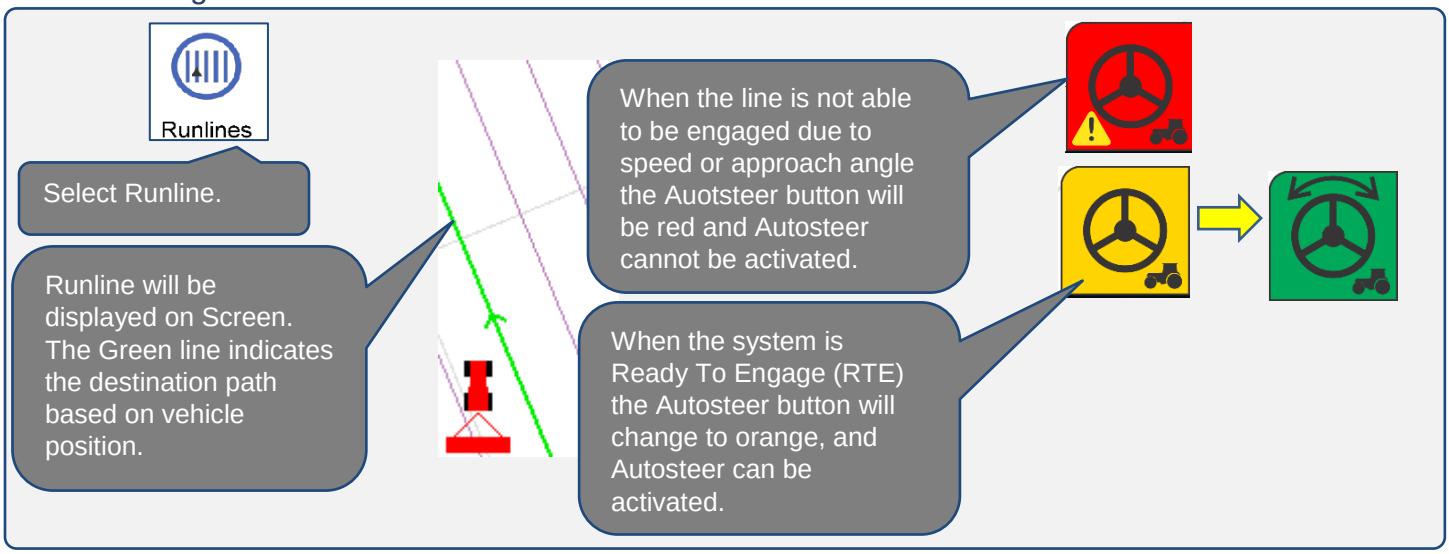
Selecting Runlines



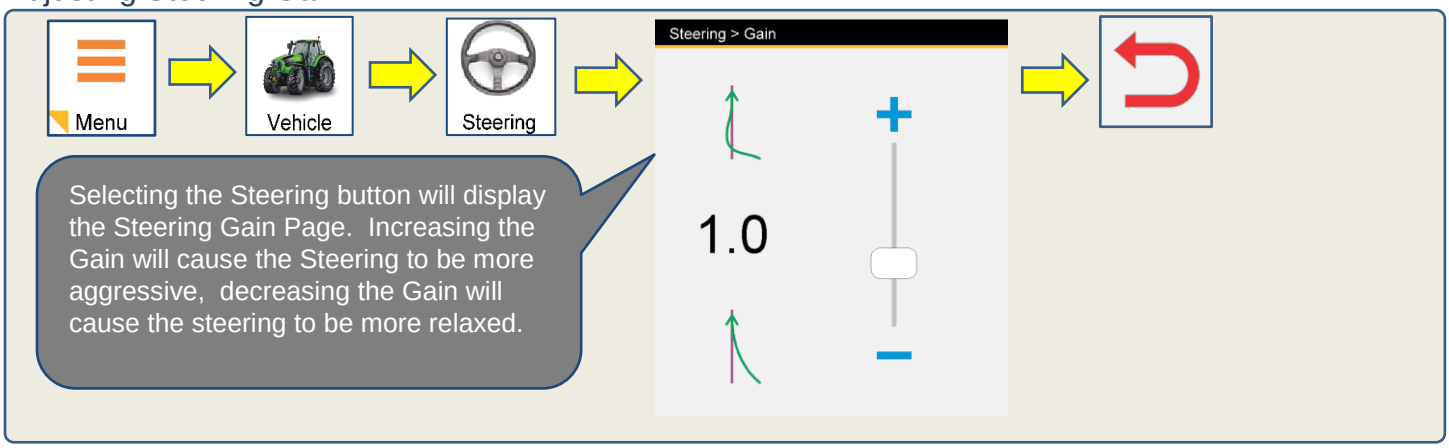
Recording Runlines



Auto Steering



Adjusting Steering Gain



Important Information.

Using high Steering Gain at higher operating speeds may result in undesirable steering performance.

AG GUIDE SOFTWARE

This section provides a high level overview of the AgGuide application and menu structure.

// Minimum requirements Windows Version, RAM, CPU etc?

// installation?

System Requirements

The availability of AgGuide application features is dependent on required components being installed. The following table shows the minimum requirements.

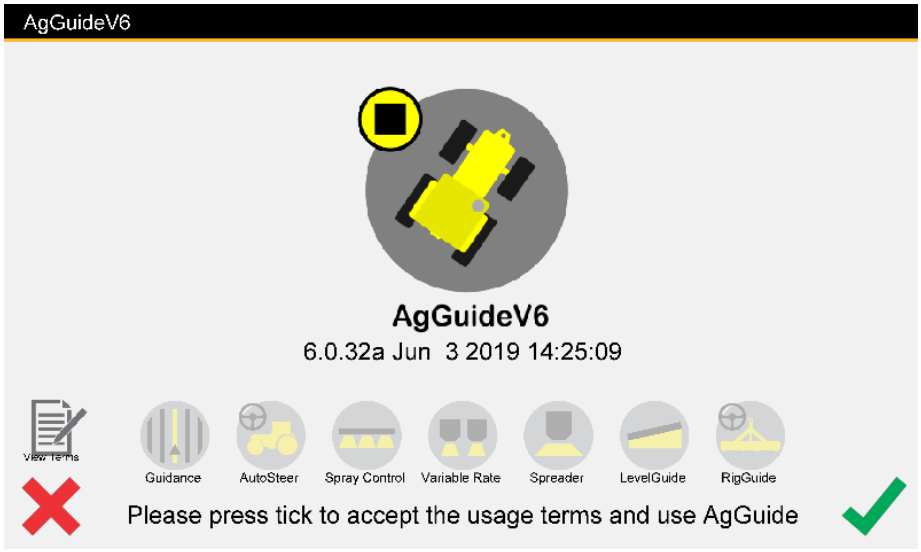
Feature	***Display***	***GPS Reciever***	***Steering Kit***	***Controller/ UniPod***	***Unlock Code***
Visual Guidance	Required	Required			
Auto Steer	Required	Required	Required		?
Sprayer Control	Required	Required	Optional	Required	?
Seeder Control	Required	Required	Optional	Required	?
Implement Steering	Required	Required	Required	Required	?
GPS Land Leveling	Required	Required	Optional	Required	?
Rig Guide					?

Auto Steer required the installation of hardware or steering kit depending on the vehicle. Refer to Precision Technology dealer for further information.

For implement steering and GPS land levelling applications Vehicle and implement bust be fitted with required hardware. Refer to your Precision Technology dealer for further information.

AgGuide Welcome Screen

The following screen is displayed when the AgGuide application is launched:

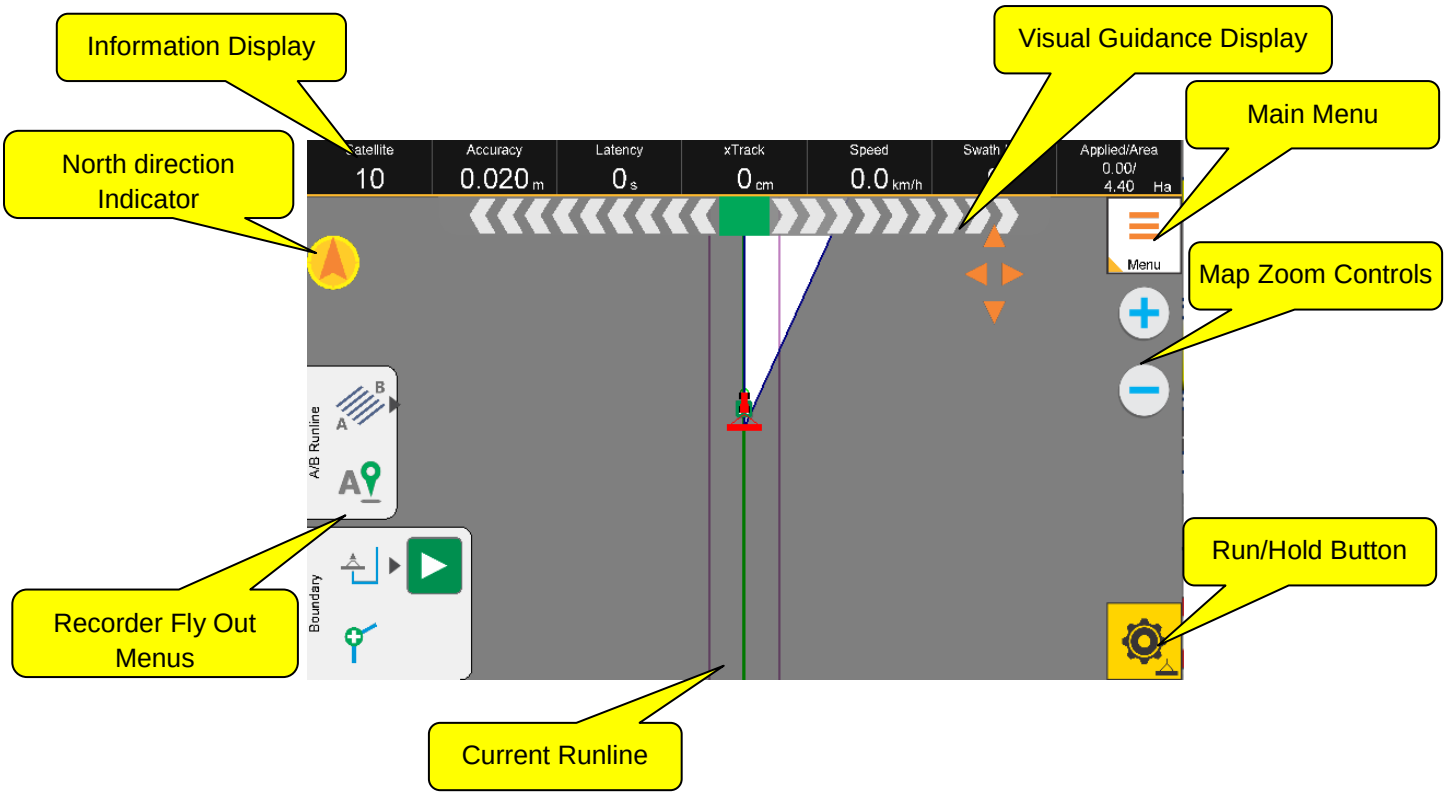


To view the terms and conditions of use select the “View Terms” button. This will display a new window with the option to accept or decline the terms and conditions. If the terms and conditions are declined the application will exit.

This button will cancel and exit the application.

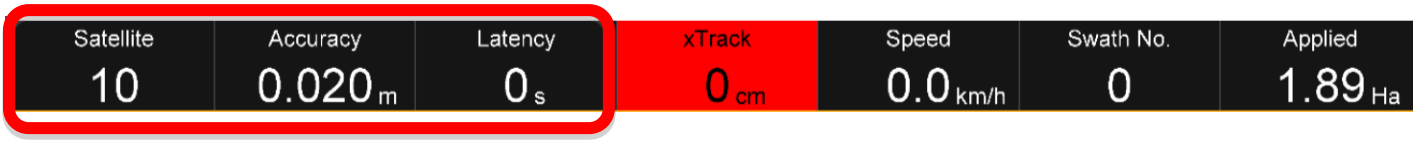
To accept the terms and conditions and continue select the Accept button. This will display the AgGuide main screen shown in the next section.

AgGuide Main Screen



Information Display Panel

The information display panel shows important information about the system and the current job.



Satellite:

This indicates the number of satellites currently being used by the vehicle for navigation.

Accuracy:

This indicates the current GPS accuracy (in meters) to 3 decimal places.

Latency:

This indicates the number of seconds since a correction signal has been received from the base. When no correction is available the indicator will display ‘0’.

GPS Status Panel

If the Satellite, Accuracy and Latency indicators are displayed in **RED** this indicates that there is no GPS input to the terminal. Refer to the GPS Configuration section for more information on configuration and troubleshooting.

Speed:

This indicates the current vehicle speed as provided by the GPS.

Swath:

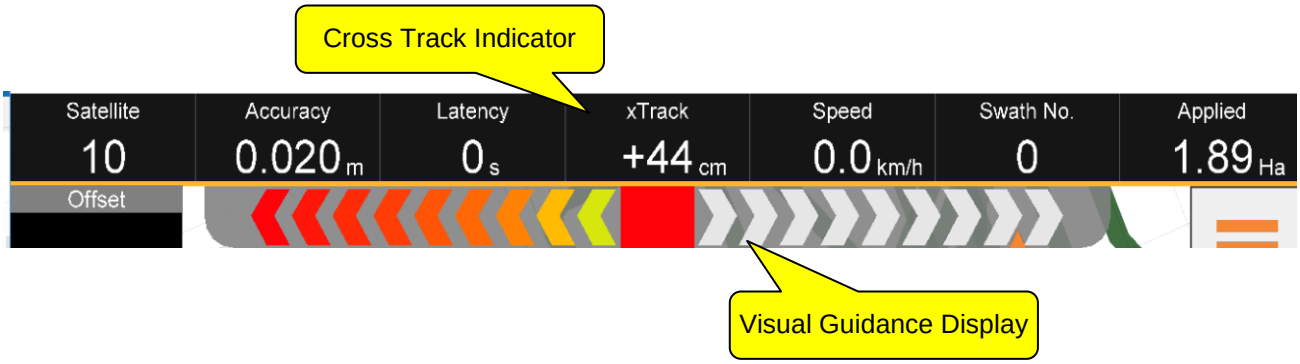
This indicates the current swath or pass with respect to the originating runline. Swaths to the right of the orginal runline will be displayed as a positive number, swaths to the left will be displayed as a negative number.

Applied:

This indicates the total applied area in the current job. Applied area is controlled by the Run/ Hold function on the main screen.

Guidance Display

The guidance display includes a Cross Track error indicator and a visual guidance display.



xTrack:

The xTrack indicator displays the Cross Track Error (XTE) which is the distance the vehicle is away from the selected runline. A positive value indicates the vehicle is to the right of the runline, negative values indicate the vehicle is to the left.

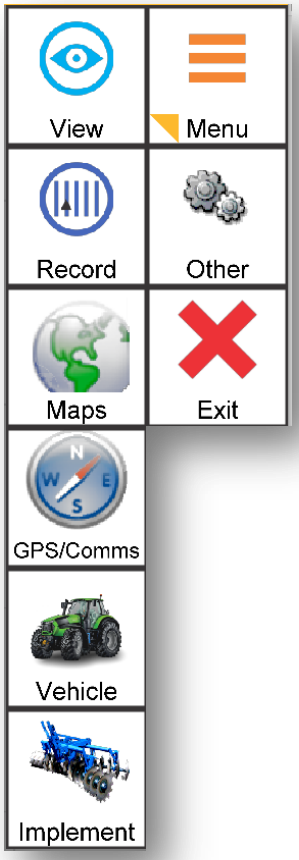
Visual Guidance Display:

When operating in Visual Guidance mode (i.e non-Autosteer) a colored lightbar displays at the top of the map.

The colored arrows indicate which way the vehicle must be turned to return to the line. Visibility of the Lightbar can be configured in the Vehicle Settings page.

Main Menu

Selecting the Menu button will display the Main menu as shown below.



View Menu:
The View menu allows you to set operator preferences including Night/ Day mode, map view mode, and change the units of measurement between metric and imperial.

Record Menu:
The Record menu allows you to record Field data including field boundaries, Headland Lines, and A-B, Contour and Pivot runlines.

Maps Menu:
The Maps menu allows you to view, edit and select user data including Client and Farm information, Fields, Runlines and job data.

GPS Comms Menu:
The GPS/ Comms menu allows you to view GPS Status information, view and edit vehicle and implement GPS configuration, Edit Radio configuration, and configure Base Stations.

Please refer to the GPS Configuration section for more detailed instructions.

Vehicle Menu:
The vehicle menu allows you to view, edit and select vehicle configurations, view and edit steering settings, and perform calibration where required.

Please refer to the Vehicle Configuration and setup section for more information.

Implements Menu:
The Implements menu allows you to select and edit implement configurations, configure implement steering, and configure Bins, Tanks, Sections and implement controllers.

Please refer to the Implement Configuration and setup section for more information.

Other Menu:
The Other menu allows you to view system information, use Tech Direct system support, manage subscription codes, manage files, log data and settings.

Exit Menu:
The exit menu allows you to minimize, close the application or shut down the terminal.

View Menu

Light/ Dark:

The Light/ Dark button changes the color scheme for the application. Dark mode is more suitable for night operation, Light Mode is more suitable for daytime operation.

Perspective:

The Perspective button alters the Map view from a 2D representation to a 3D visual representation.

Grid:

The Grid button toggles whether a Grid is overlaid on the map.

Overview Map:

The Overview Map provides the map screen in a smaller view. This is useful when running other applications such as Variable Rate or Levelling, where the implement control is displayed in the main window.

Unit:

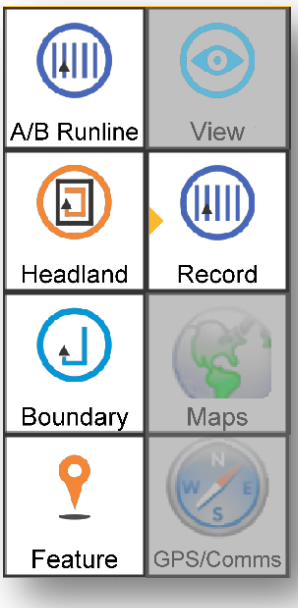
The Unit button toggles between metric and imperial units. This will change speed, distance and area units in the display, vehicle and implement settings.

Changing Units

When changing the units between metric and imperial please note that Product Units and Application rates are not affected. For example, if an application rate is configured for Kg/Ha, after changing units to imperial the application rate remains in Kg/Ha.

Record Menu

A/B Runline:



The A/B Runline button allows you to record A/B, A + Heading, Adaptive contour and Pivot runlines. Selecting this button will toggle visibility of the A/B Runline recording fly out menu.

The flyout menu will remain visible on screen when the Main Menu is closed. To hide the menu, reselect the A/B Runline button.

Headland:

The Headland button allows you to record a headland pass. Selecting this button will toggle visibility of the Headland recording fly out menu.

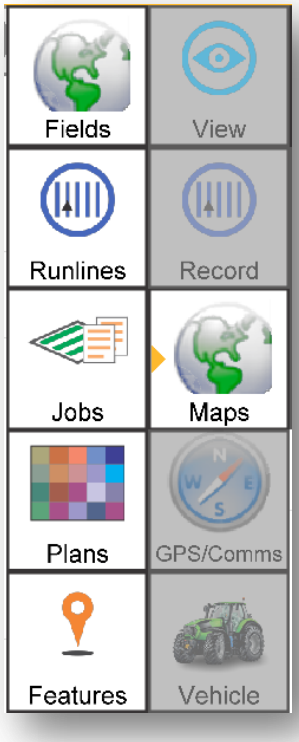
The flyout menu will remain visible on screen when the Main Menu is closed. To hide the menu, reselect the Headland button.

Boundary:

The Boundary button allows you to record an Interior or Exterior boundary in a field. Selecting this button will toggle visibility of the Boundary recording fly out menu.

The flyout menu will remain visible on screen when the Main Menu is closed. To hide the menu, reselect the Boundary button.

Maps Menu



Fields:

The Fields button allows you to select, edit and create Clients, Farms and Fields.

Runlines:

The Runlines button allows you to select, edit and create runlines. Runlines are filtered based on Client, Farm and Field selections in the Fields Menu.

Jobs:

The Jobs button allows you to select edit and create jobs. Jobs are filtered based on Client, Farm and Field selection in the Fields Menu.

Plans:

The Plans button allows you to select and add prescription maps for Variable Rate Control (VRC), and control plans for LevelGuide applications.

Features:

The Features button allows you to edit and select map features such as Markers, obstacles, etc.

GPS Comms Menu

Status:

The Status Button displays GPS Status information for the connected GPS Receiver.

Radio:

This provides RTK configuration in the GPS Receiver.

Vehicle:

The Vehicle Button displays the Vehicle GPS setup and configuration page.

Implement:

The Implement Button displays the Implement GPS setup and configuration page.

Base:

This configures Base Selection in the GPS Receiver.

COM:

The COM Button displays the COM Menu for configuration of data communications for system components. This includes CORS, Terminal COM ports, CAN Bus configuration, and system configuration of Vehicle and Implement GPS ports.

Vehicle Menu

Select:

The Select Button allows you to view, edit and select existing Vehicles and create new Vehicle definitions.

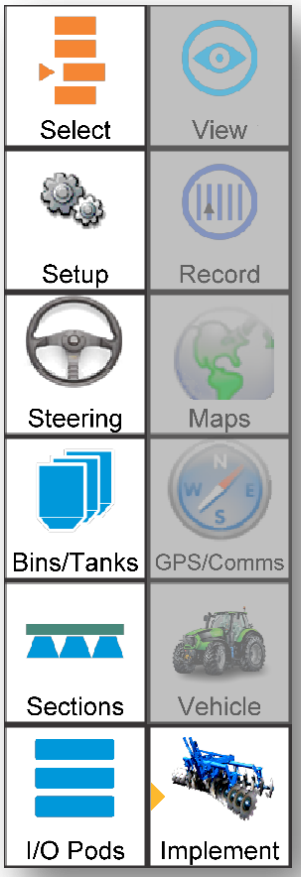
Setup:

The Setup button allows you to view and edit vehicle configuration for the selected vehicle.

Steering:

The Steering button allows you to adjust vehicle steering gain and steering settings.

Implement Menu



Select:

The Select button allows you to view, edit and select existing implements and create new implement definitions.

Setup:

The Setup button allows you to view and edit implement configurations for the selected implement, including Hitch configuration, Control Mode and implement geometry.

Steering:

The Steering button allows you to adjust implement steering gain and steering settings.

Bins/ Tanks:

The Bins/ Tanks button allows you to configure product Bins or tanks for VRC applications such as sowing, spreading and spraying.

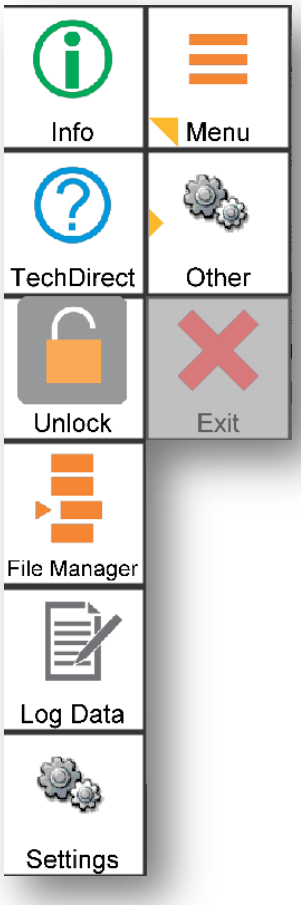
Sections:

The Sections button allows you to configure sections for Section Control applications such as sowing, spreading and spraying.

I/O Pods:

The I/O Pods button allows you to configure external controllers for VRC or Land levelling operations.

Other Menu



Info:

The Info button displays System information including Software version, CAN Bus information.

TechDirect:

The TechDirect button allows you to establish a remote Service connection to allow Technical Support to access your system. Requires Network connectivity and Team Viewer application software to be installed.

Unlock:

The Unlock button allows you to enter Unlock/ subscription codes for application features such as AutoSteer, LevelGuide and other features.

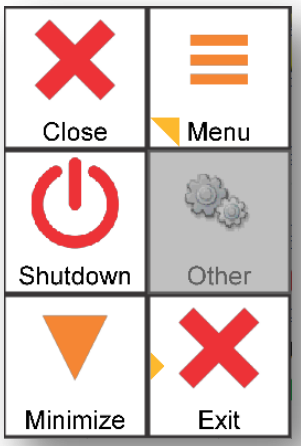
File Manager:

The File Manager button opens the Windows file manager.

Log Data:

This button stores the last two minutes of data from the system. This information can be analyzed by a Precision Technology Technician for fault finding.

Exit Menu



Close:

The Close button closes the application. A confirmation window will be displayed asking to confirm or cancel the operation.

Shutdown:

The Shutdown button will close the application and force the terminal to shut down. A confirmation window will be displayed asking to confirm or cancel the operation.

Minimize:

The Minimize button will minimize the application. The application will continue to run in the background.

USING CLIENT, FARMS AND FIELD DATA

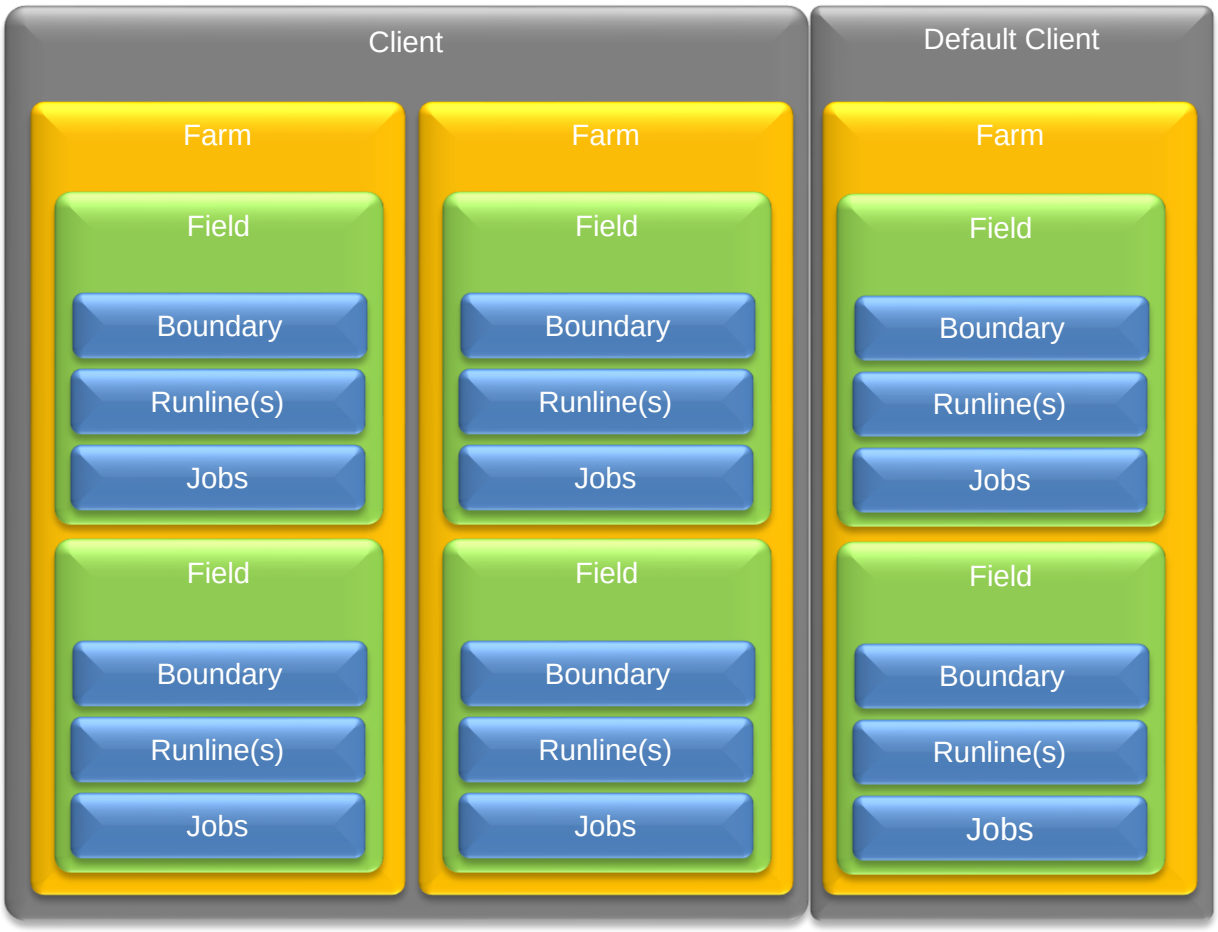
Overview

The AgGuide application uses the following items to represent user data:

- Clients: represent the farmer or customers;
- Farms: represent individual farms which contain fields;
- Fields: represent individual fields which contains Actions;
- Actions: which include Boundaries, Runlines, Jobs and marked features or obstacles.

The relationship between the entities is shown below:

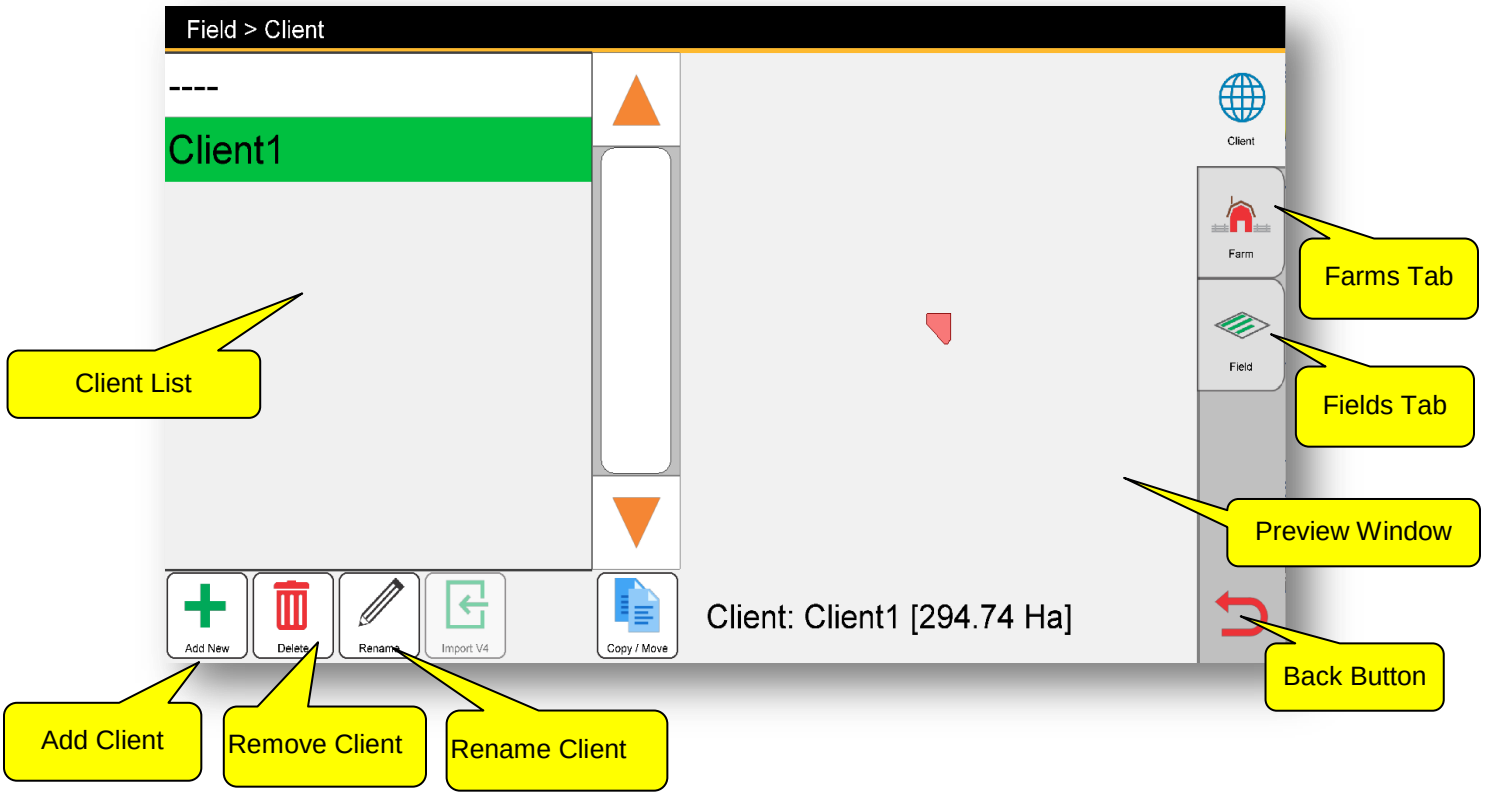
//Confirm Relationship for no Client



Each Farm may contain multiple fields, with each field containing multiple runlines, boundaries or other marked features.

If no Client data has been defined the Farm is associated with a default client, displayed as “----” in the client list.

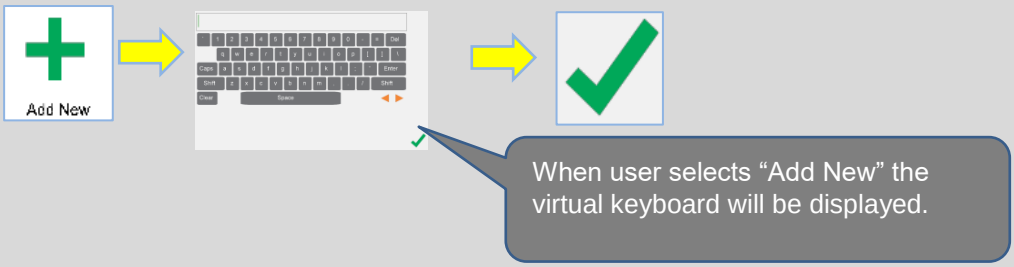
Managing Client Data



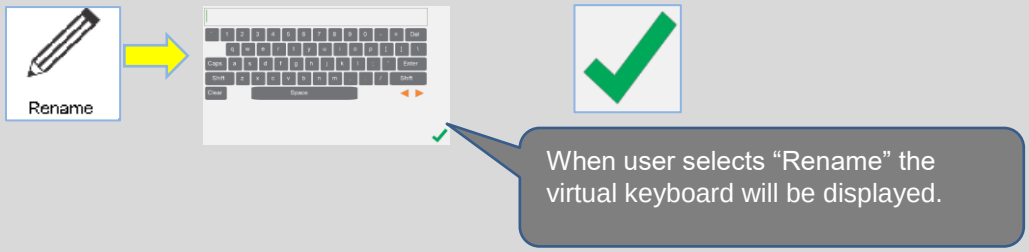
Function	*Information*
Farm Tab	The Farm Tab will display Farms associated with the selected Client. Changing the selected Client will change the Farms displayed in the Farm Page.
Field Tab	The Field Tab will display all Fields associated with the selected Client and selected Farm. Changing the selected Client or Farm will change the Fields displayed in the Field Page.
Preview Window	Preview Window displays a geographical outline of the Fields associated with the selected client.
Back Button	Closes the page and returns to the main window. Any changes in selection will persist.
Client List	Displays a list of all Clients.
Add	Add a new Client.
Delete	Deletes and Existing Client. All data associated with the Client will be lost.
Rename	Changes name of the Client. All data associated with the Client will remain.
Import V4	Import Client information from the AgGuide V4 database.
Copy / Move	Allows you to duplicate a Client. Selecting this will display the copy move menu.

Open the Clients Page

Adding a new Client



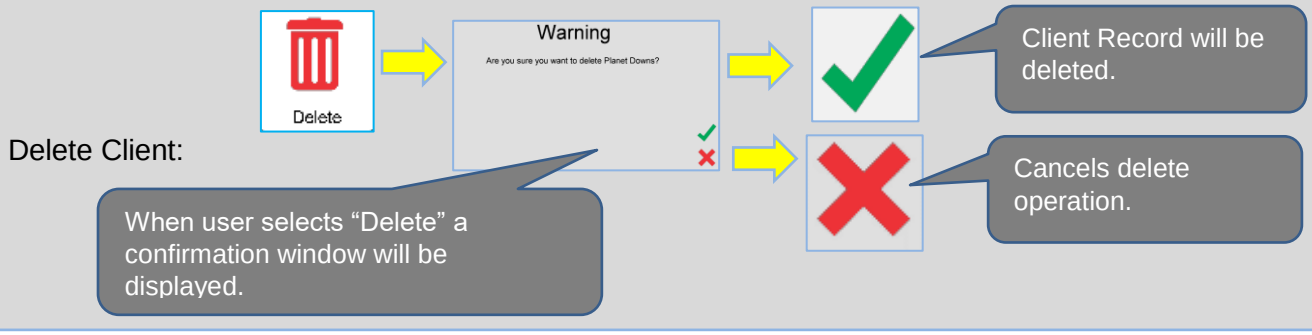
Renaming a Client



Importing a Client from AgGuide V4

//TODO: need V4 Data

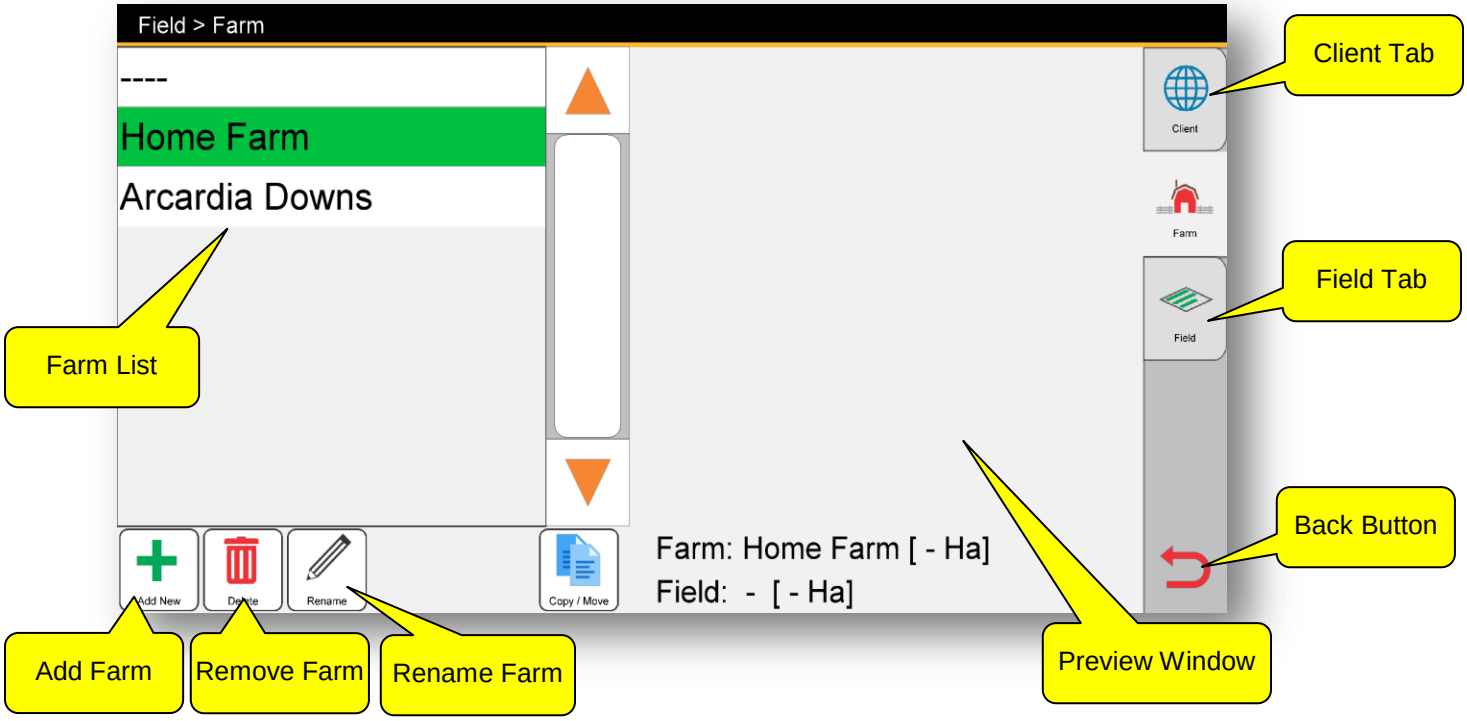
Deleting a Client



Warning!

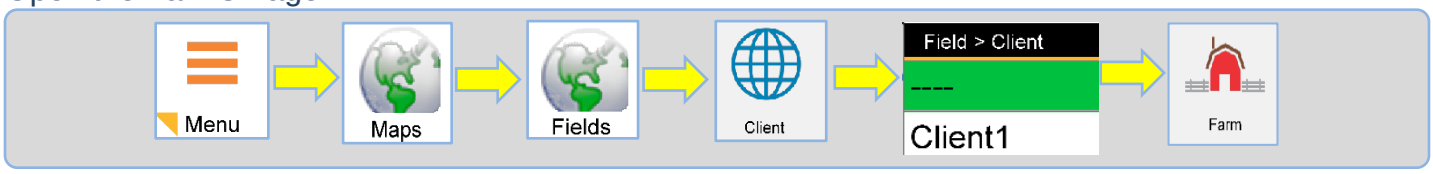
Deleting a client which contains farm or field data will result in loss of all farm and field data.

Managing Farm Data

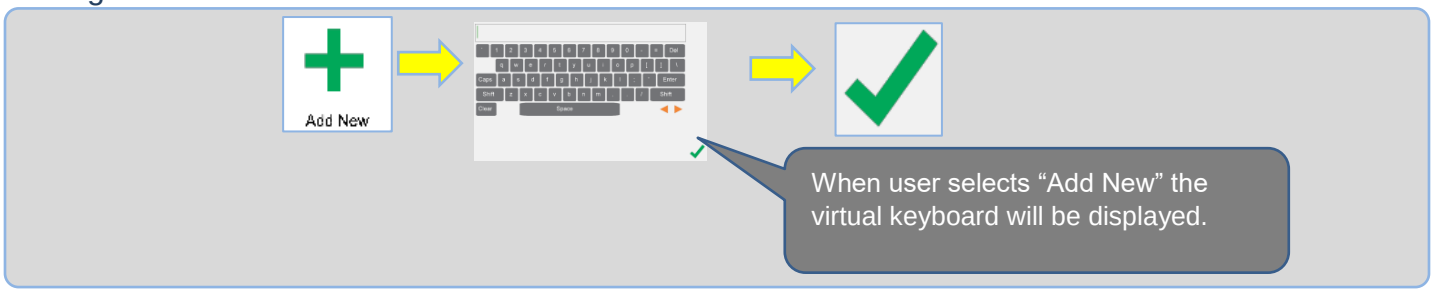


Function	*Information*
Client Tab	The Client Tab will display Clients page. Changing the selected Client will change the Farms displayed in the Farm Page.
Field Tab	The Field Tab will display all Fields associated with the selected Client and selected Farm. Changing the selected Client or Farm will change the Fields displayed in the Field Page.
Preview Window	Preview Window displays a geographical outline of the Fields associated with the selected client.
Back Button	Closes the page and returns to the main window. Any changes in selection will persist.
Farms List	Displays a list of all Farms associated with the selected Client.
Add	Add a new Farm.
Delete	Deletes an Existing Farm. All data associated with the Farm will be lost.
Rename	Changes name of the Farm. All data associated with the Farm will remain.
Copy / Move	Copy Move allows you to Create a copy of the Selected Farm. This can then be renamed or copied to a different client.

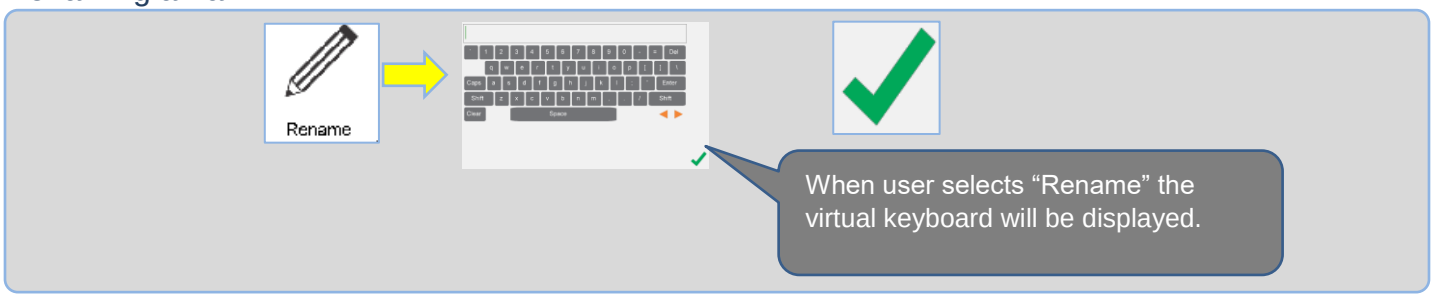
Open the Farms Page



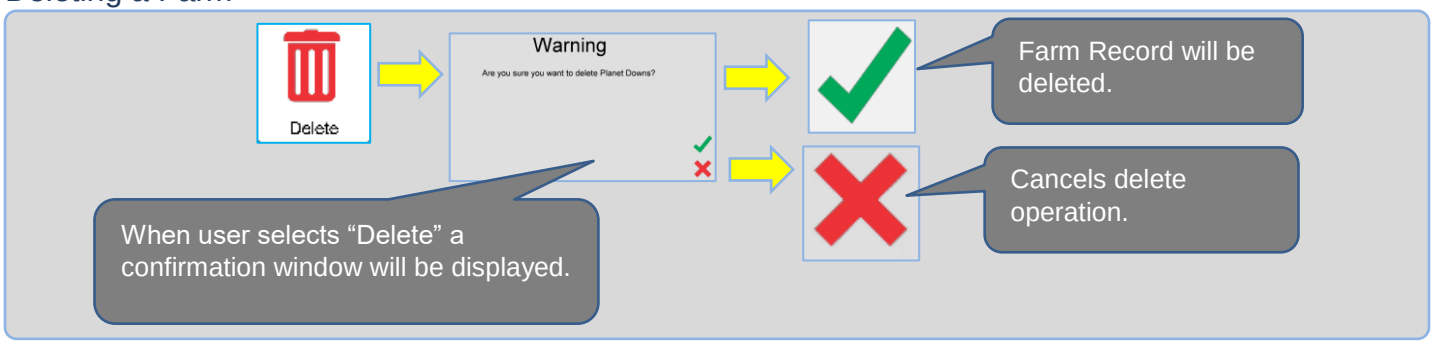
Adding a new Farm



Renaming a Farm



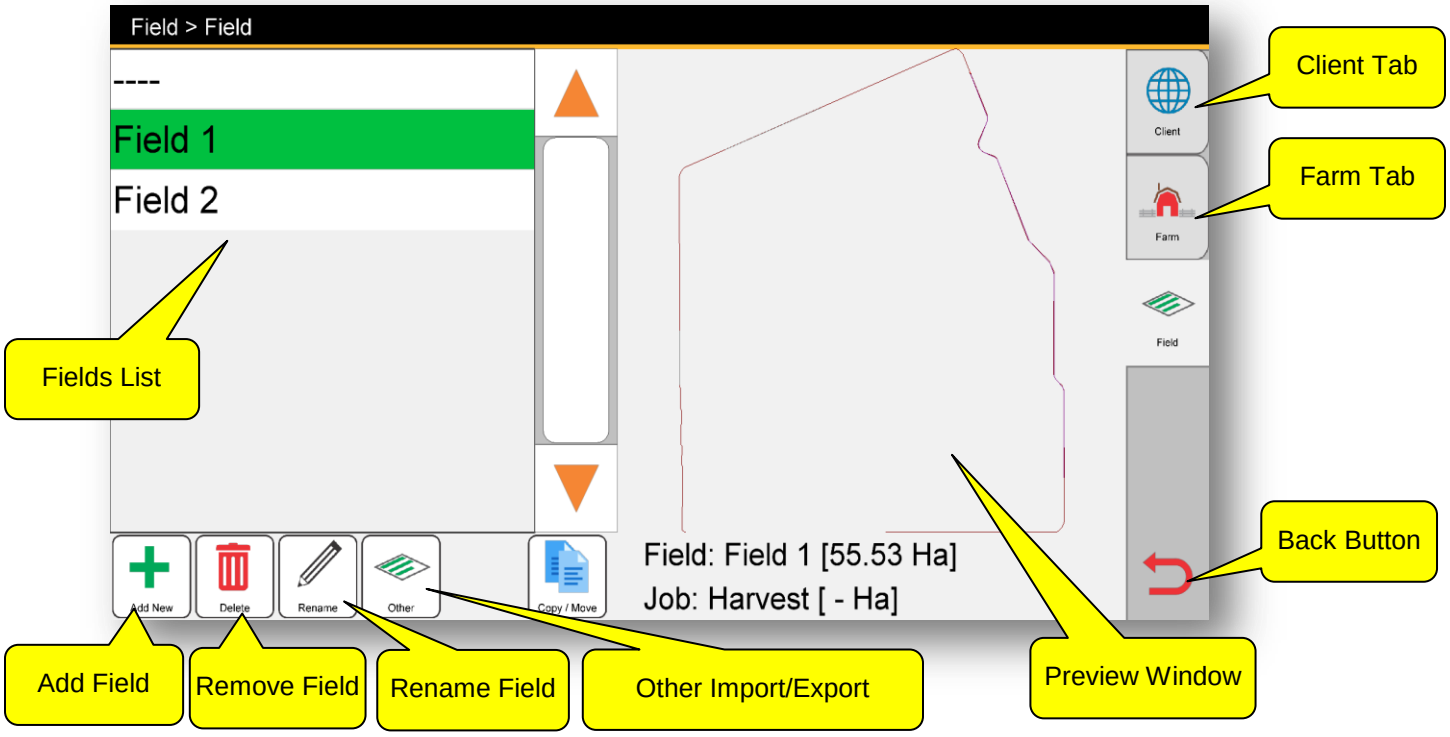
Deleting a Farm



Warning!

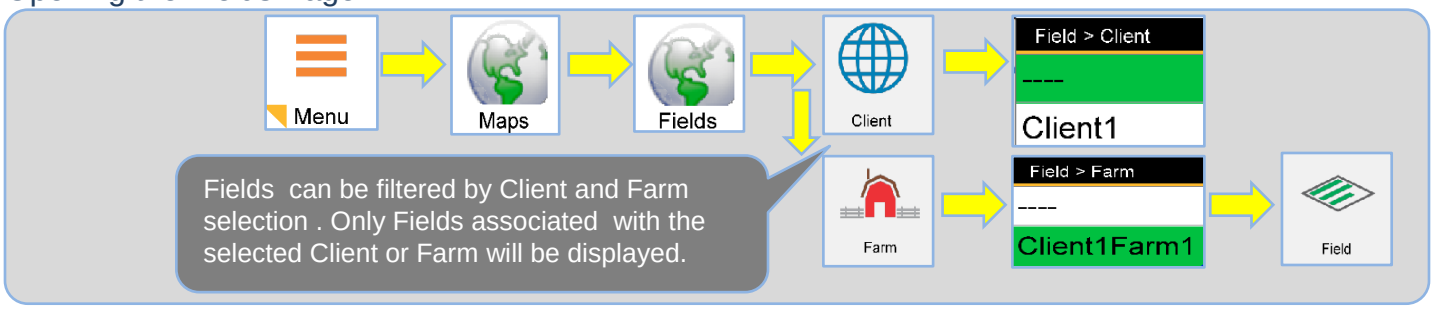
Deleting a Farm which contains field data will result in loss of all farm and field data, including jobs, boundaries and runlines.

Managing Field Data

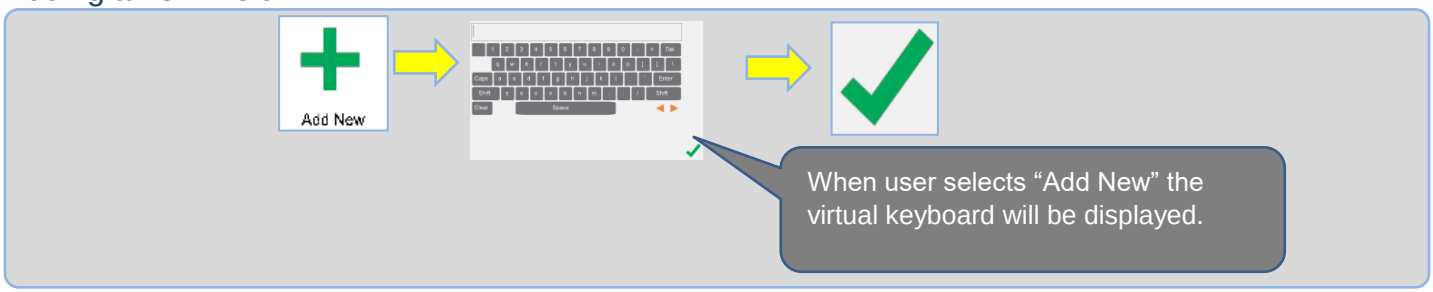


Function	*Information*
Client Tab	The Client Tab will display Clients page. Changing the selected Client will change the visible Farms and Fields.
Farms Tab	The Farm Tab will display all Farms associated with the selected Client. Changing the selected Client or Farm will change the Fields displayed in the Field Page.
Preview Window	Preview Window displays a geographical outline of the Fields associated with the selected Field.
Back Button	Closes the page and returns to the main window. Any changes in selection will persist.
Fields List	Displays a list of all Fields associated with the selected Client/ Farm
Add	Add a new Field.
Delete	Deletes an existing Field. All data associated with the Farm will be lost.
Rename	Changes name of the Field. All data associated with the Farm will remain.
Copy / Move	Copy Move allows you to Create a copy of the selected Field. This can then be renamed or copied to a different client/ farm.

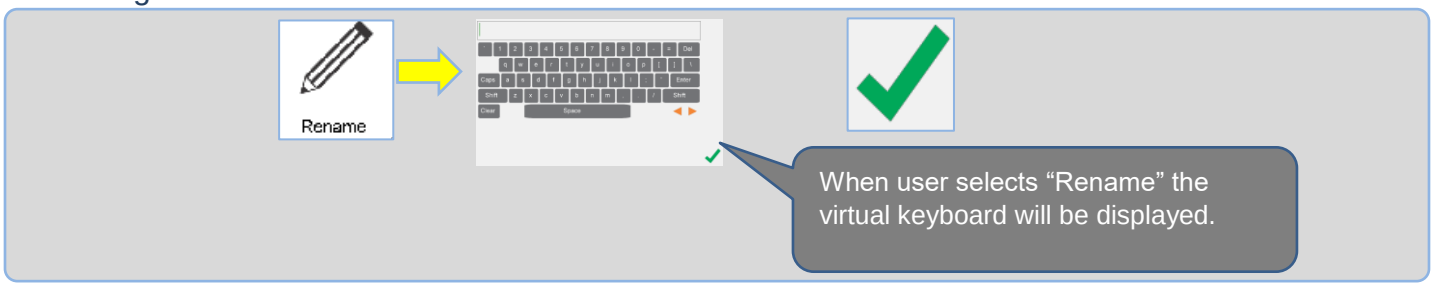
Opening the Fields Page



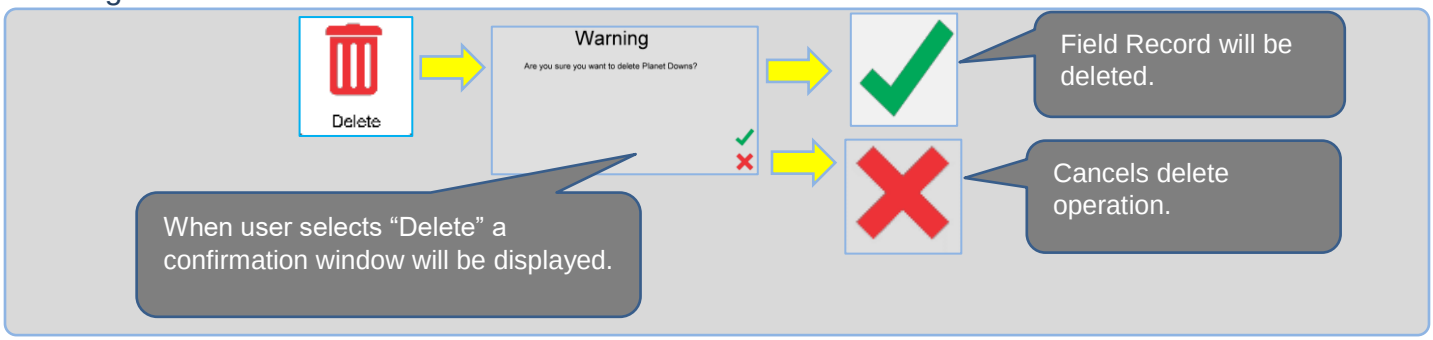
Adding a new Field



Renaming a Field



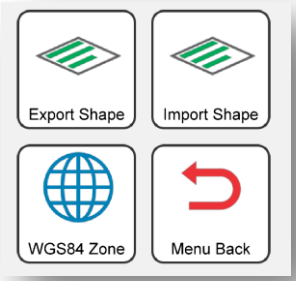
Deleting a Field



Warning!

Deleting a Field will remove all field data, including jobs, boundaries and runlines.

Other Field Operations



Import and Export Field Data

Field Data can be imported and exported as a universal 'Shape' (.shp) files. This allows interchange of field information with external applications such as Farm Management Information Systems (FMIS).

When exporting Field Data all runlines and job data associated with the field will be exported.

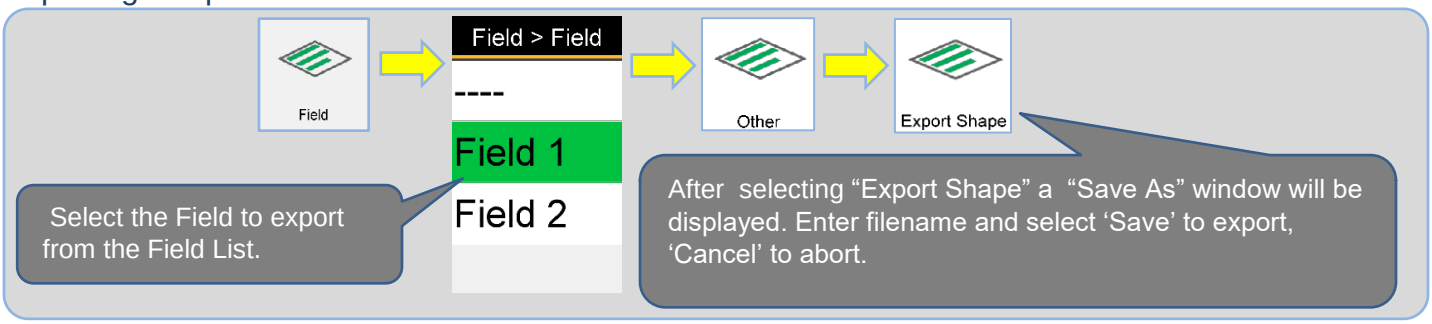
WGS84 Zone

This option allows the user to manually enter the WGS84 Zone (1 – 60) in which the farm is located. If a value of 0 is entered AgGuide will automatically detect the correct Zone. AgGuide can define the zone by the following:

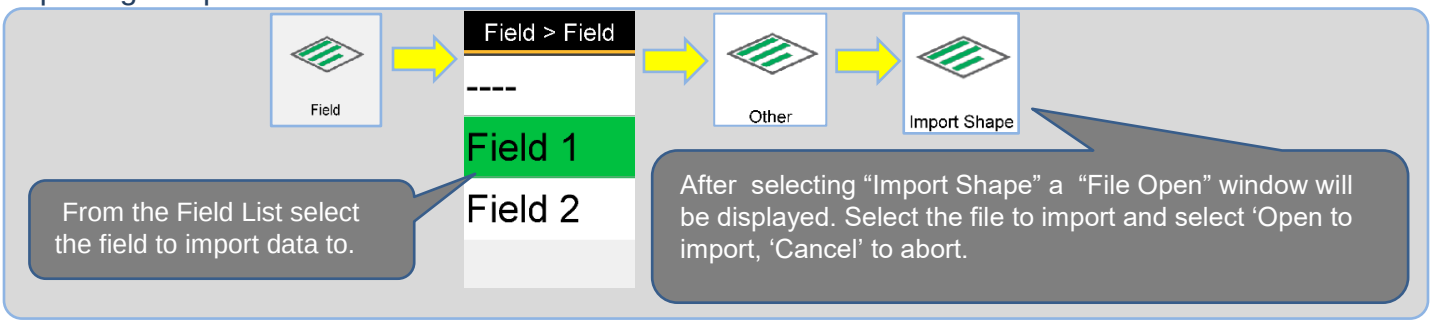
- Importing a shape file to define a field,
- Automatically determining zone from GPS information. This will work for any user not close to or overlapping the boundary of a zone.

Appendix D contains information to select your correct UTM Zone.

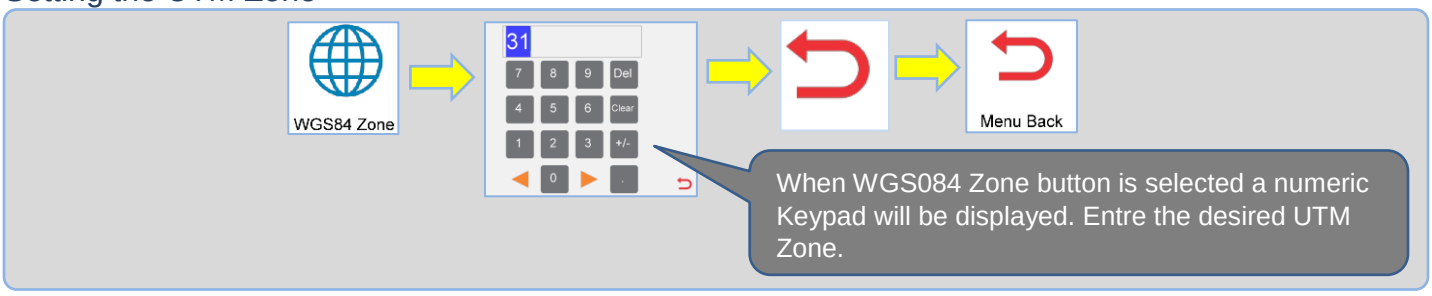
Exporting Shape File



Importing Shape Files



Setting the UTM Zone



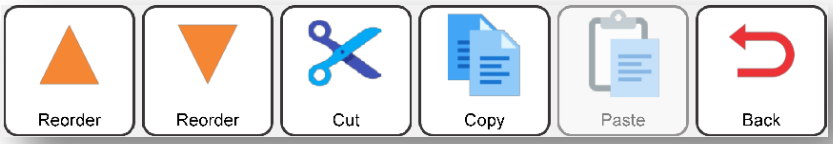
Copying and Moving Records

The AgGuide application allows the user to copy and move Farm and Field Records, allowing you to copy Farm data to a different client, or copy Field data to a different farm.

A Client can only be duplicated. When Client is duplicated, all associated Farm and field Data is also duplicated.

A Farm belonging to one client can be copied or moved to a farm belonging to another client. Similarly, A field belonging to one farm can be copied or moved to another farm.

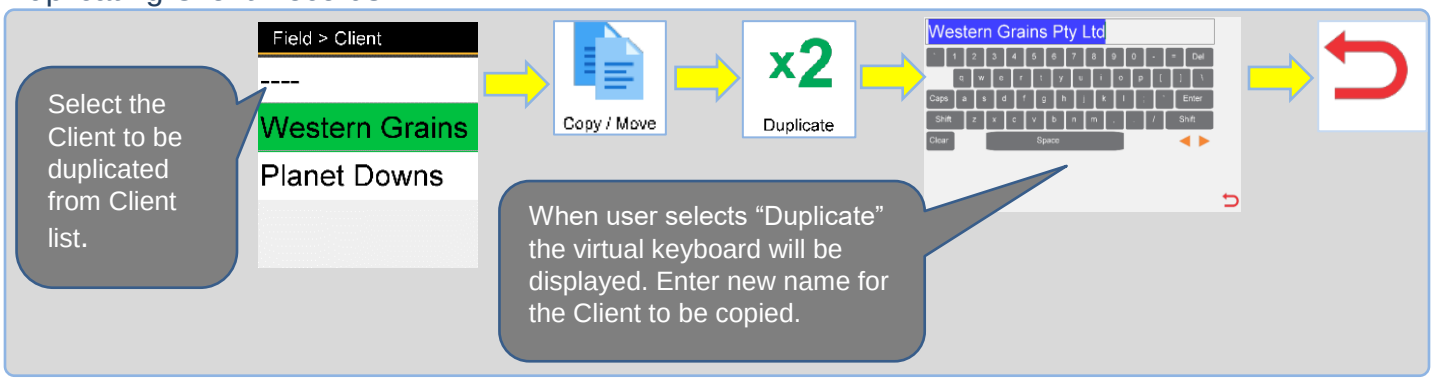
Client Copy/Move Menu



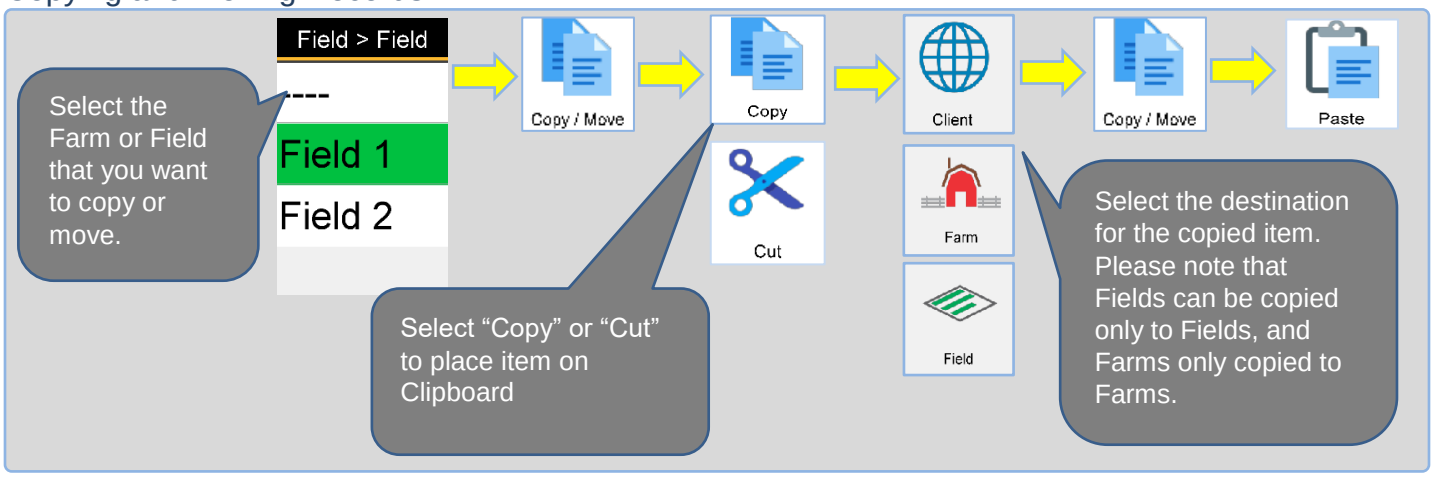
Farm & Field Copy/Move Menu

Function	*Information*
Reorder Buttons	The Reorder buttons will move the selected item up or down in the list. This applies to all items in the Client, Farm and Field pages.
Cut Button	Cut will select and remove the selected item from the current list. This is applicable to Farm and Field pages
Duplicate Button.	Duplicate will create a copy of the selected Client item. Duplicate is only available on the Client Page.
Copy Button	Copy will create a copy of the selected item without removing from the existing client. This is applicable to Farm and Field Pages.
Paste Button	Paste will insert the cut or copied item into the selected list. This allows a field to be copied from one farm to another, or a farm to be copied to a different client.
Back Button	Back button will close the Move Copy menu. Any copied or Cut items will remain on the clipboard.

Duplicating Client Records



Copying and Moving Records



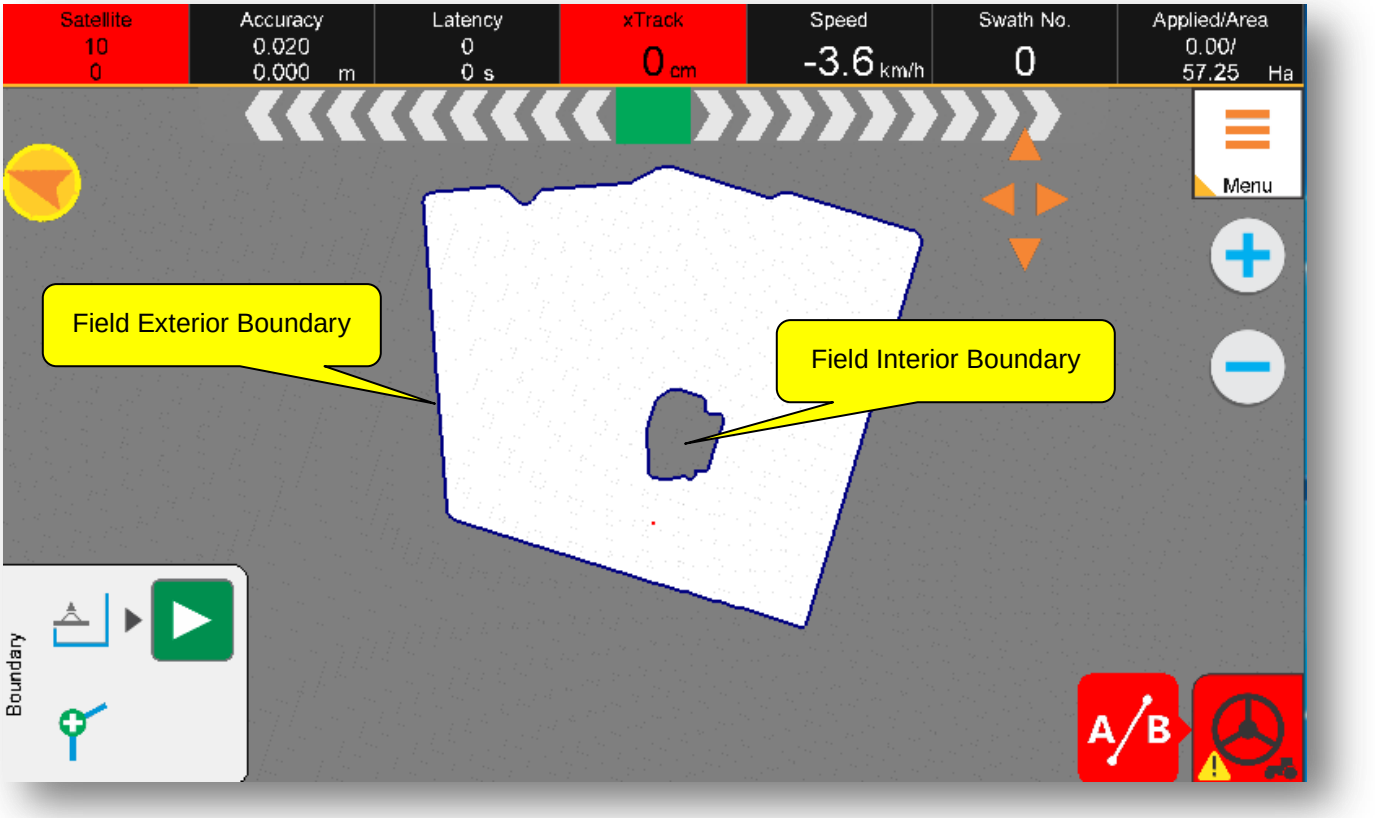
BOUNDARIES, HEADLAND PASSES AND RUNLINES

Boundaries

Overview

A boundary represents a field area. Each field can contain a perimeter or external boundary, and can also include interior or exclusion zones. An interior boundary may represent an area not to be treated, or an obstacle such as a rocky area or waterway.

A boundary is not a guidance path, but is used for application control such as spreading or spraying , where the sections will automatically open/ close when entering or exiting a field area.



A field boundary can be recorded either by setting individual points, by recording the vehicle path, or by a combination of both. When setting points, the vehicle path between the points is not recorded, resulting in a straight line eliminating variations in vehicle position.

Boundary recording cab be performed simultaneously whilst recording a runline, or whilst engaged on a runline. Additionally, Headland Passes can be automatically whilst recording. Boundary recording will complete automatically when the vehicle is within proximity of the starting point, or when the Finish Button is selected.

All boundary recording follows the same simple steps:

- Open the boundary Recording Menu
- Select Recording Point
- Select the boundary Type
- Select the headland Line recording mode
- Record the Boundary.

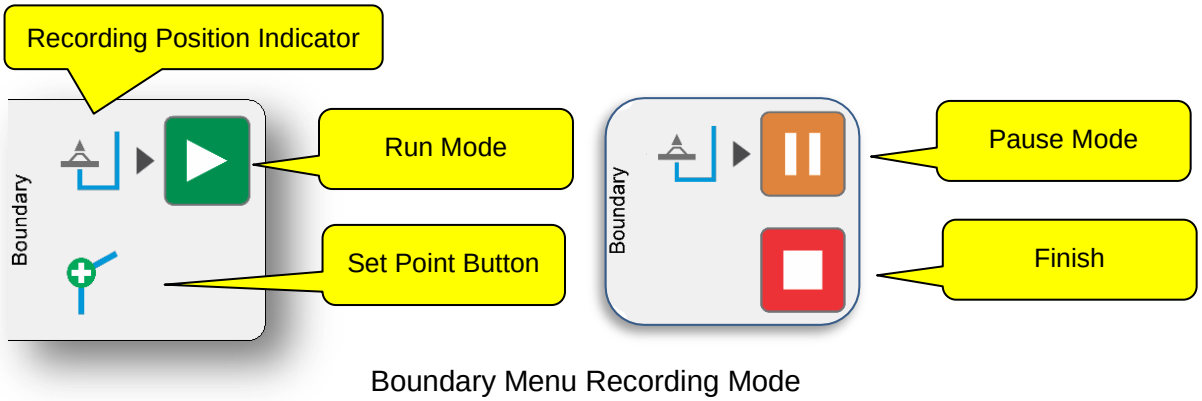
The sequences are detailed in the following sections.

// It is possible to create multiple external boundaries in the same field?

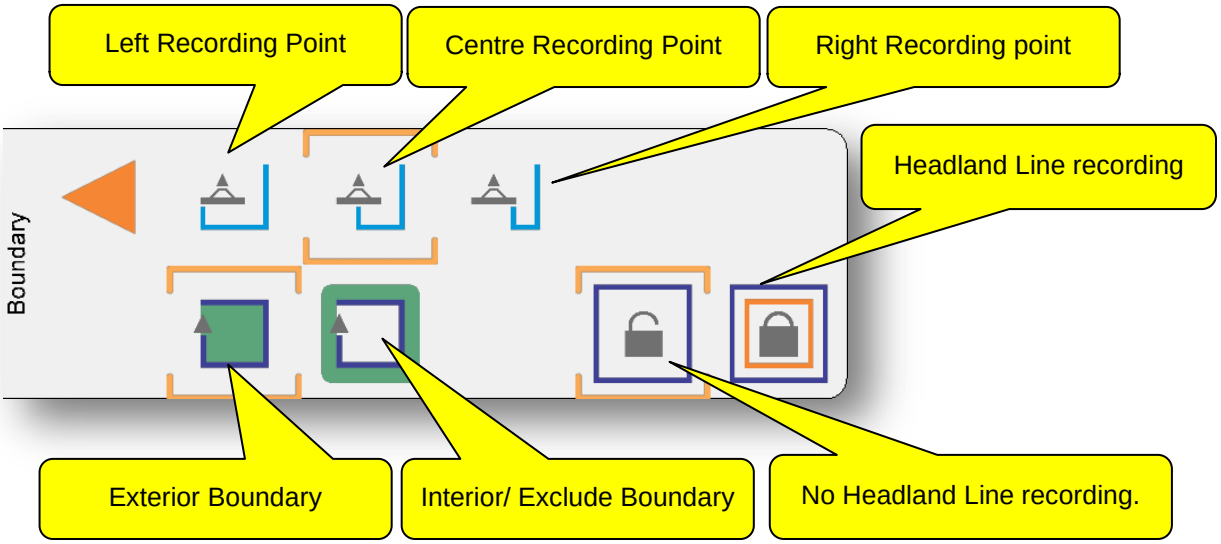
// It is possible to create “ interior” / exclusion zone outside of field?

// Creating a new boundary doesn’t automagically create a new field as in v4?

Boundary Recorder Menu



Boundary Menu Recording Mode

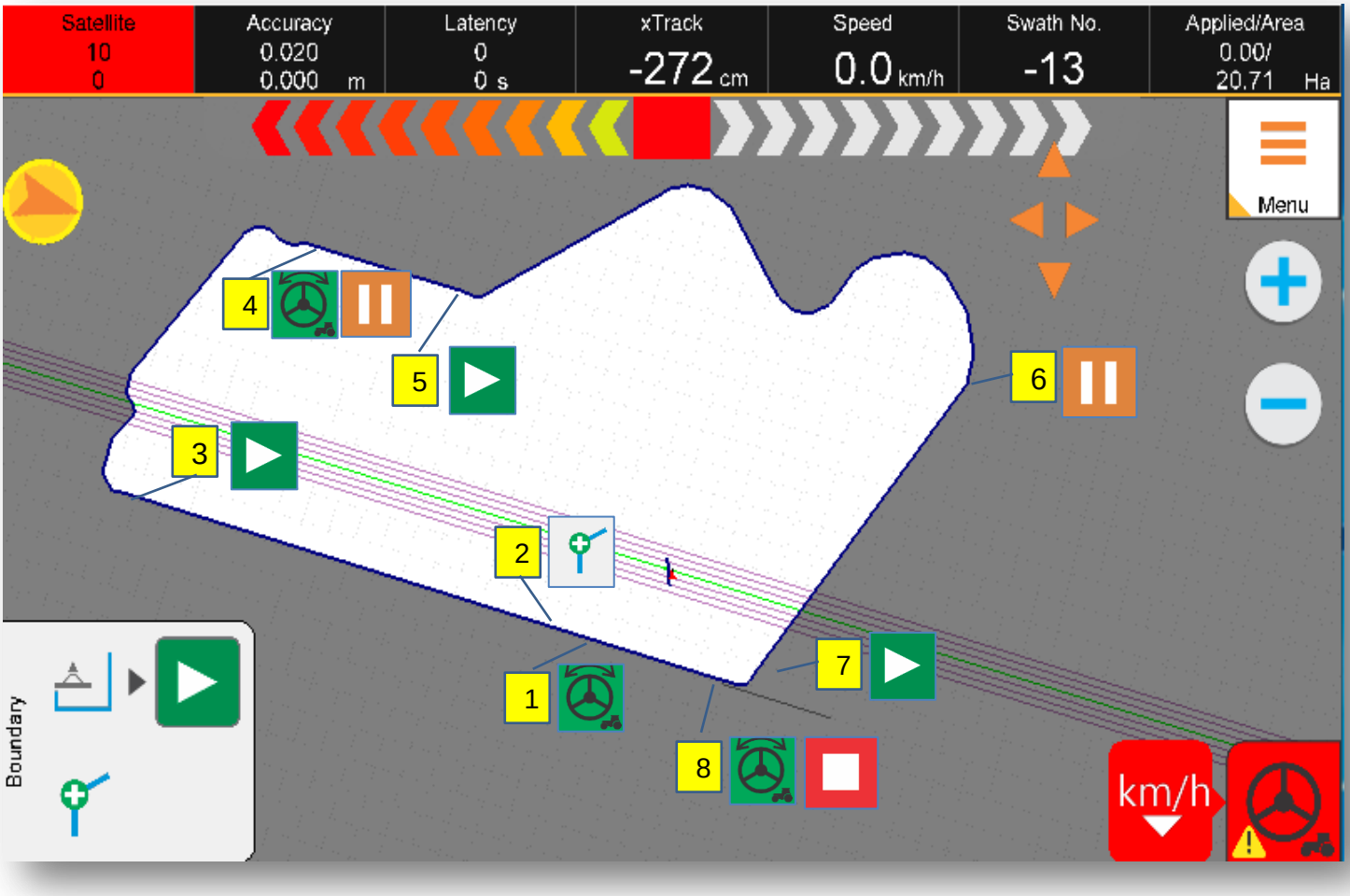


Boundary Menu Options Mode

Function	*Information*
Record Position indicator Button	This button indicates the current recording point. Selecting this will toggle the Menu between recording mode (above) and options mode pictured lower.
Run/ Pause Mode Button	Run/ Pause toggles boundary recording. When paused, no points are recorded.
Finish Button	Finish will close the boundary from the last recorded point to the start point.
Set Point Button	Adds a single point to the Boundary. This creates a line segment between the new point and the last recorded point.
Left Record Point	Sets the Boundary recording point to the Left of the implement swath.
Center Record Point	Sets the boundary recording point to the center of the implement swath.
Right Record Point	Sets the boundary recording point to the right of the implement swath.
Headland Line Recording	When selected, a headland line will be recorded simultaneously with boundary recording.
Exterior Boundary	When selected an exterior boundary will be created. This represents a workable area.
Interior Boundary	When selected an interior boundary will be created. This represents a non workable area.

Boundary Recording Example

The following picture illustrates the recording steps for a typical exterior field boundary, using an existing AB parallel Runline.



At Point 1 the operator engages Autosteering on the AB Runline. Once the XTE is acceptable, select the Set point button (Point 2). This starts the boundary recording process.

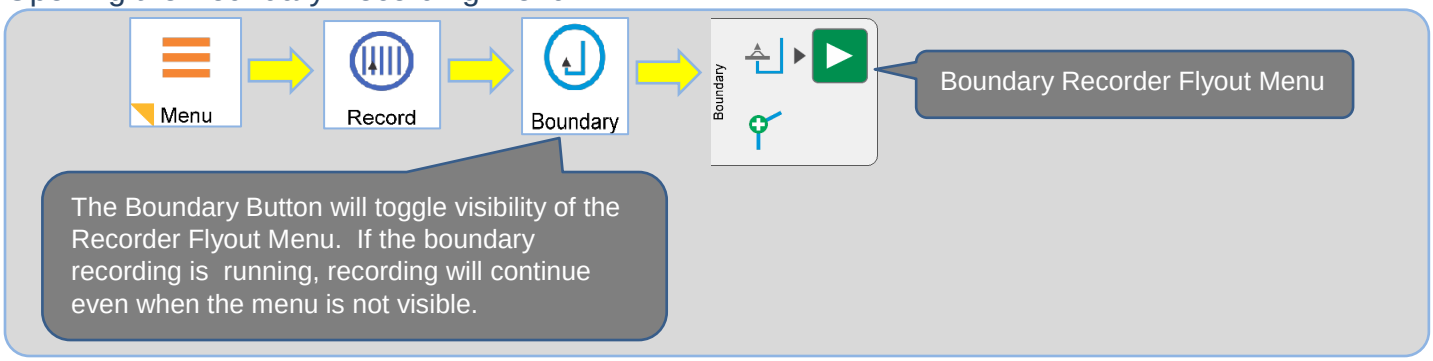
At Point 3 select Run Mode to record the curved headland area. At Point 4 the boundary is once again straight and parallel to the original AB runline. Engage the AB runline, and select Pause.

At point 5 the switch from Paused to Run mode. At Point 6 the perimeter is once again straight, and recording is paused. At point 7, on approach to the original runline, switch from paused to Run mode, and steer onto the original AB runline.

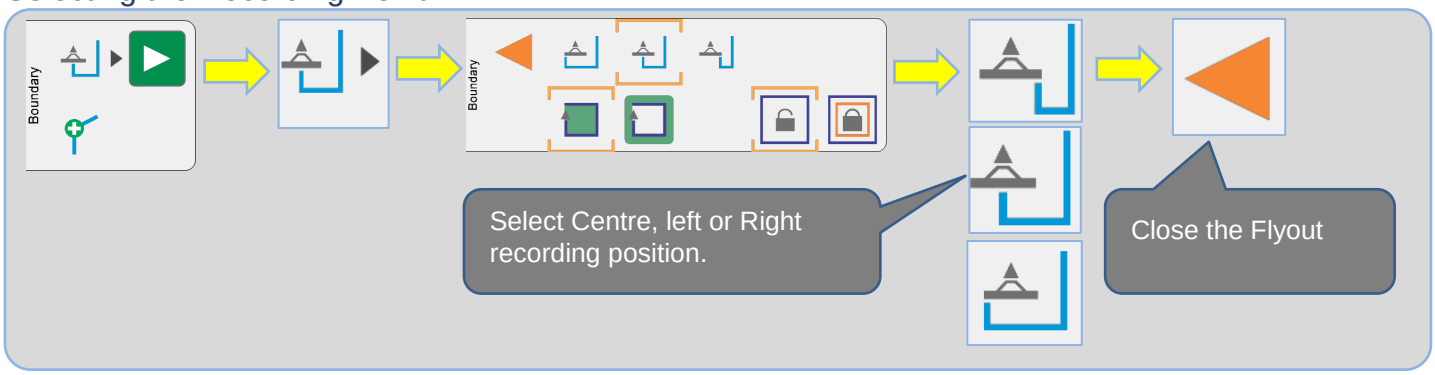
At point 8, engage the runline and select finish button to complete the boundary.

Boundary would also auto close when within proximity to point 2, without the need to select the finish button.

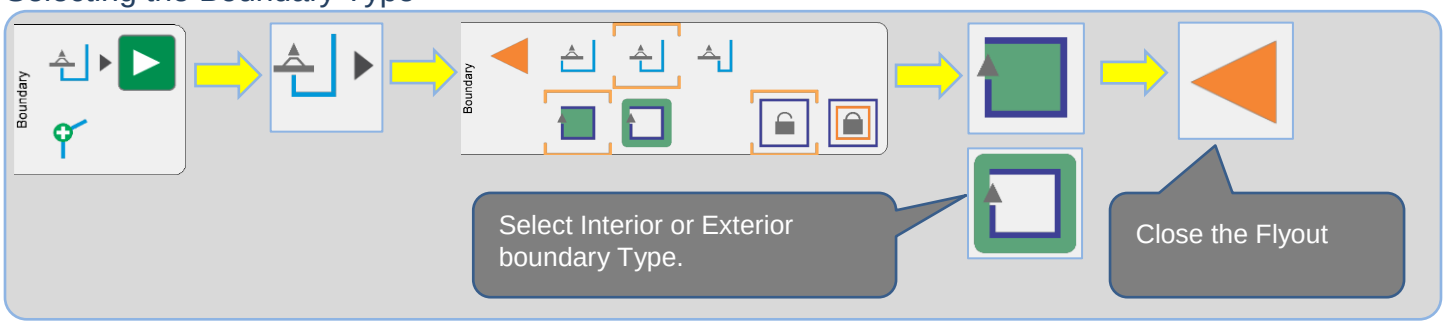
Opening the Boundary Recording Menu



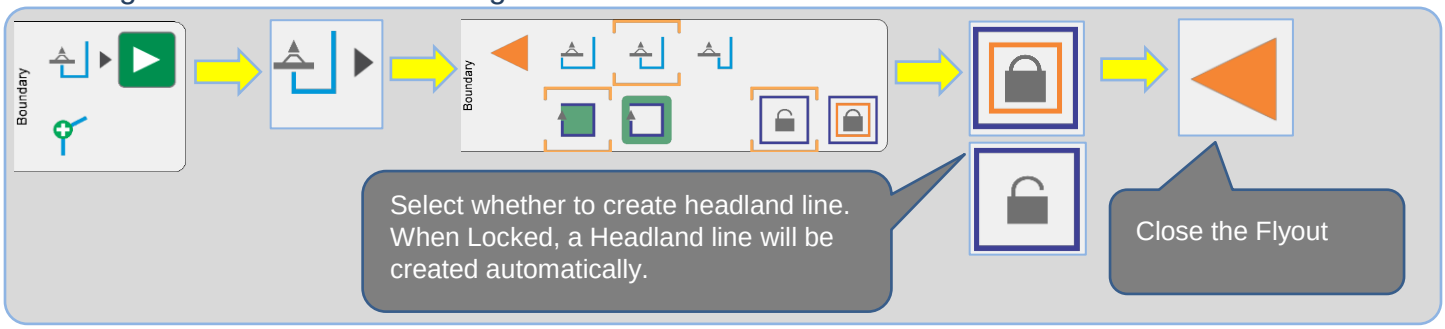
Selecting the Recording Point



Selecting the Boundary Type



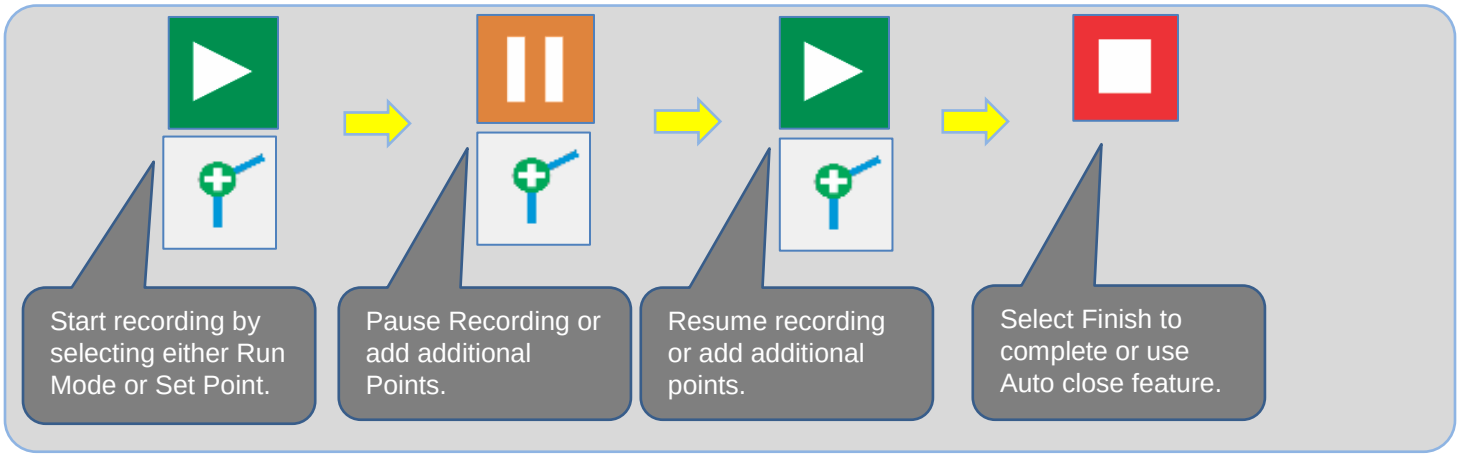
Selecting Headland Line Recording Mode



Information about Headland Passes.

When headland Line recording is Locked, the number of Headland paths created is determined by the current number of headland passes selected in the Headland Menu.

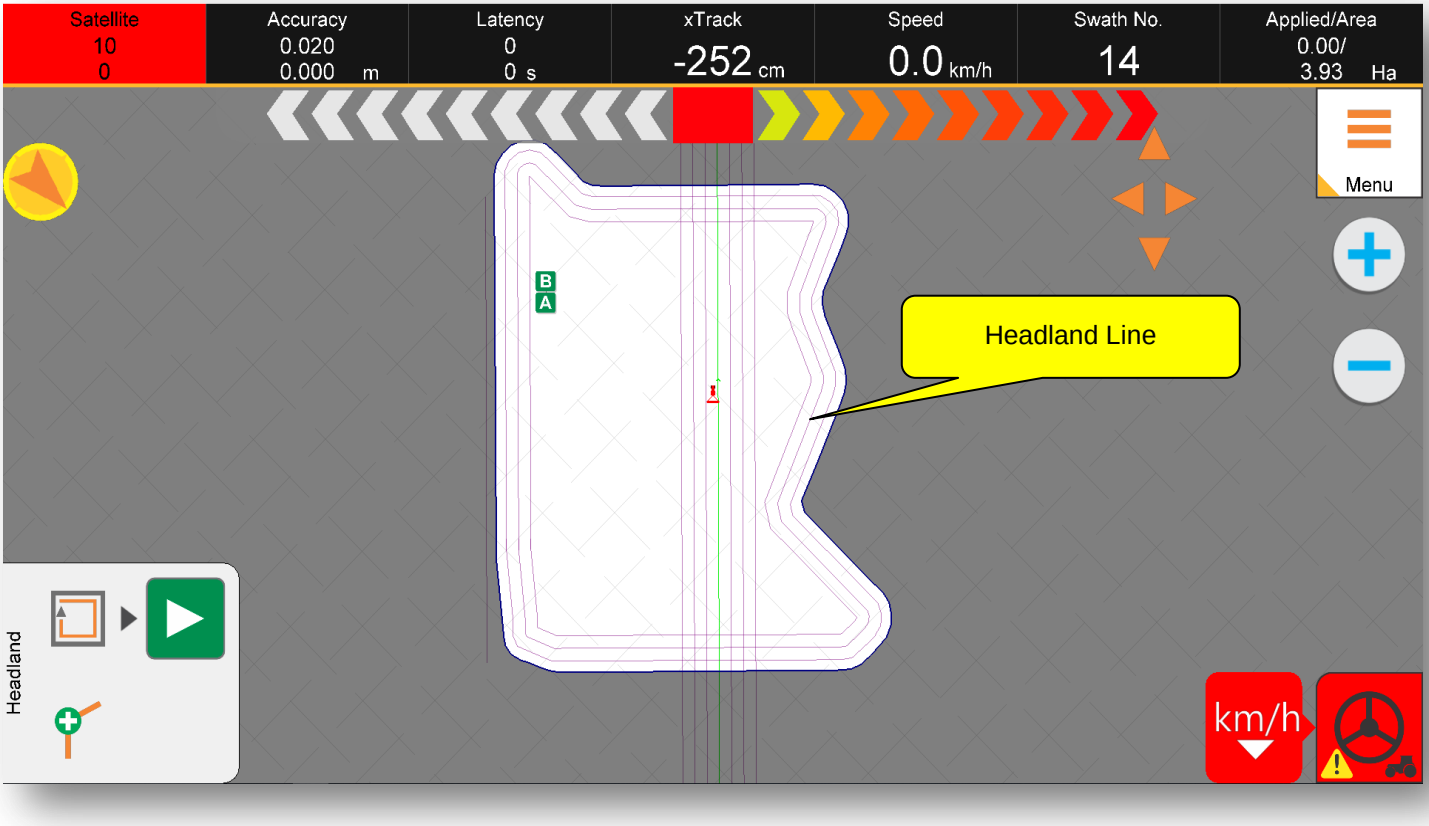
Recording Field Boundary



Headland Passes

Overview

A Headland Line represent Headland pass guidance path. A headland line can be recorded simultaneously with boundary recording, or recorded separately. A headland Line can be a closed path, or an open path similar to an AB Parallel or Contour runline.



Headland Lines differ from parallel or adaptive runlines in the following ways:

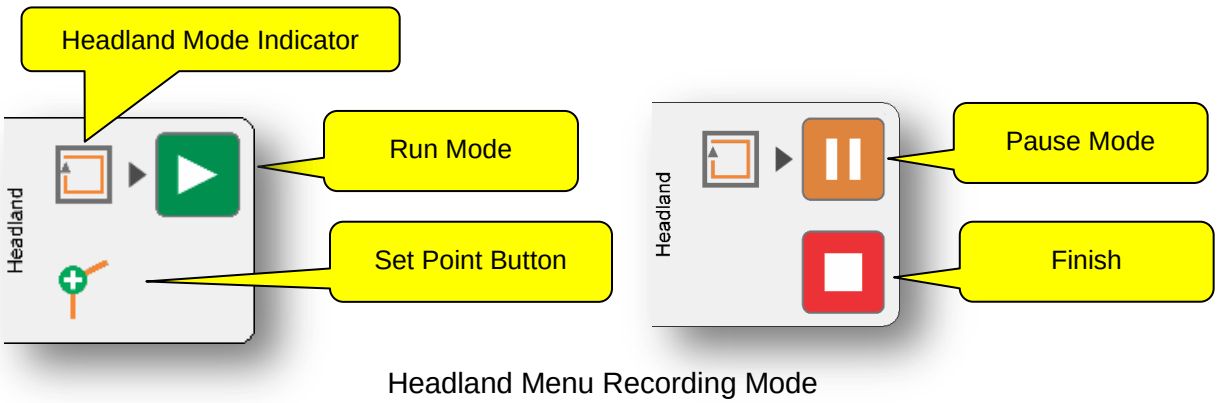
- A Headland line can provide a closed or continuous path when created using Boundary Recorder.
- A Headland line only present a set number of passes.
- A headland line position is independent of the implement width, ie passes recorded with a 3 m implement will remain at 3m swath if a different implement configuration is selected. // Is this meant to be like that? Implement settings “swath Width mode” only changes the swath width on Runlines….

The use of Headland lines is not dependent on the use of field boundaries.

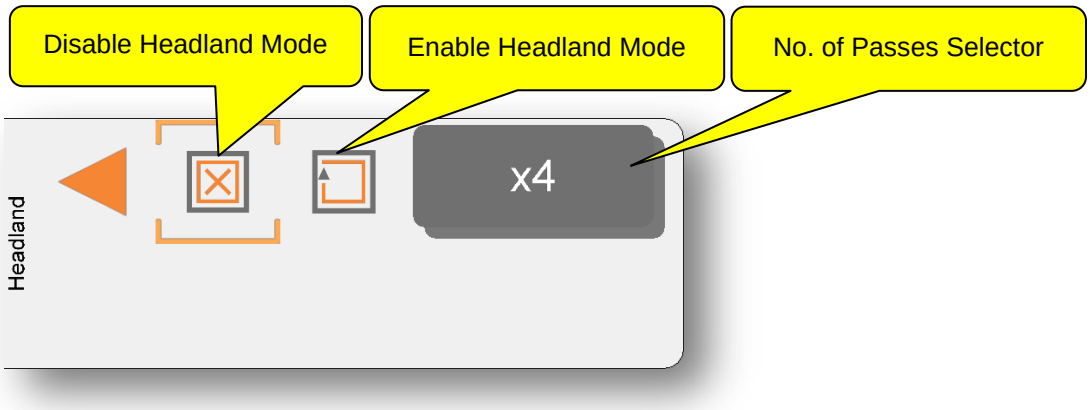
Changing the Headland Line position.

When using a Headand Line with different implement widths it may be necessary to adjust the Row Width and Runline Offset to position the Headland Line correctly. Refer to Changing the Runline Row Width and Changing the Runline Offset for more information.

Headland Recording Menu



Headland Menu Recording Mode



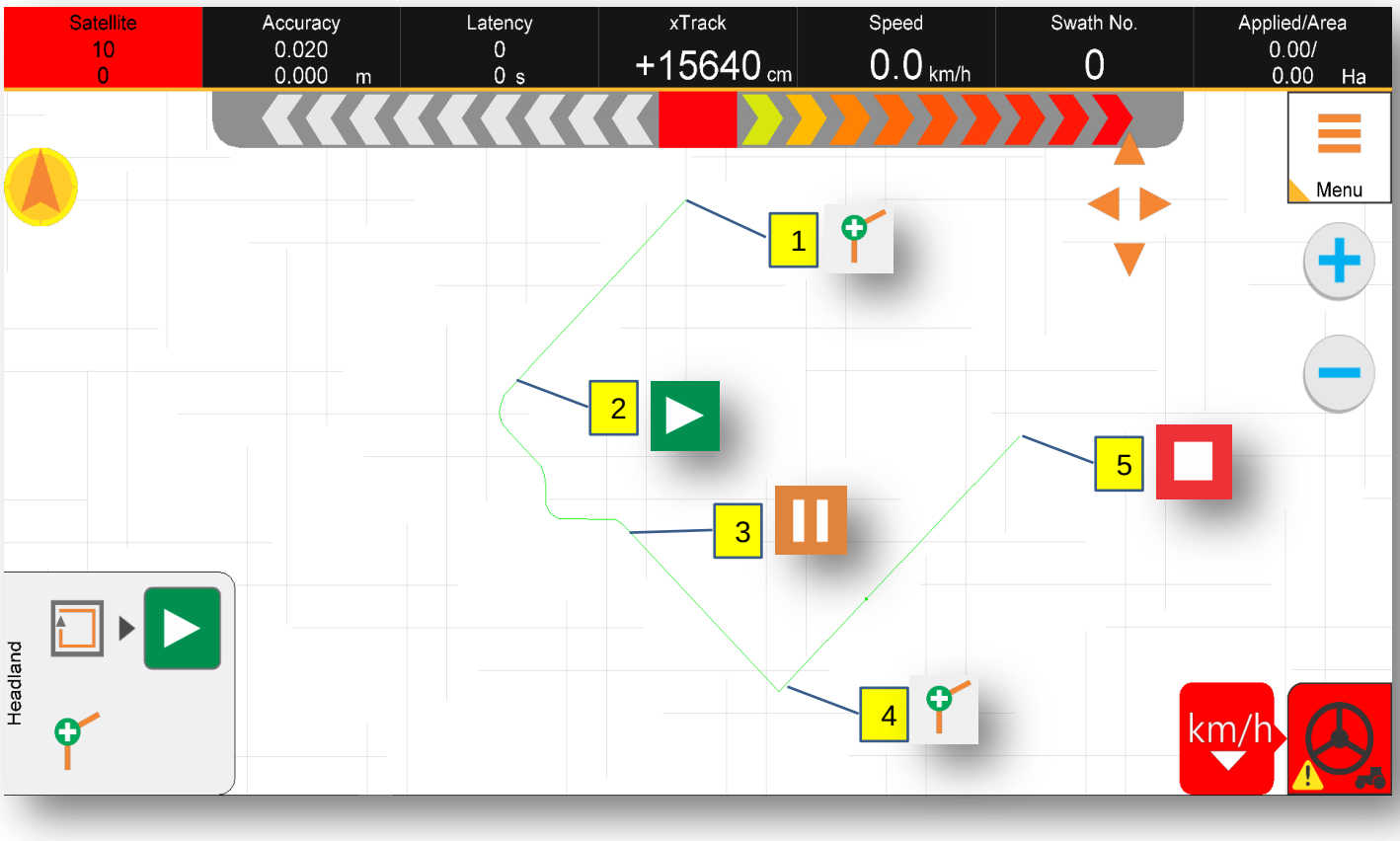
Headland Menu Options Mode

Function	*Information*
Headland Mode Indicator	This button indicates if Headland Mode is enabled or disabled. Selecting this button with toggle the menu between recording mode and options mode.
Run/ Pause Mode Button	Run/ Pause toggles Headland recording. When paused, no points are recorded.
Finish Button	Finish will cease Headland recording.
Set Point Button	Adds a single point to the Headland Line. This creates a line segment between the new point and the last recorded point.
Disable Headland Mode Button.	When selected headland recording will be disabled.
Enable Headland Mode	When selected headland recording will be enabled.
Number of Passes Selector.	This indicates the number of headland passes that will be generated when recording is completed. Selecting this item will display a numeric keypad.

Headland Recording Example

A headland line can be created at the same time a boundary is recorded. Please refer to the Boundary Recording Section of this document for more information.

The following illustrates the steps required to create a headland Pass independently of boundary recording.



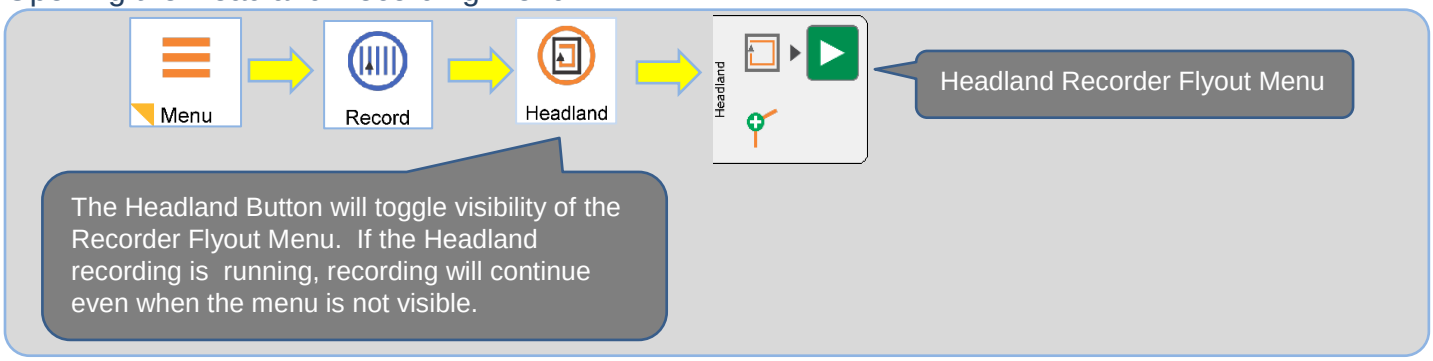
At point 1, Headland recording is started by selecting the Set point button. This creates the starting point of the Headland line.

At point 2 Headland recording is switched to recording mode to record an irregular area of the headland. At point 3,resulting an a contour following the Headland area. Headland recording is paused.

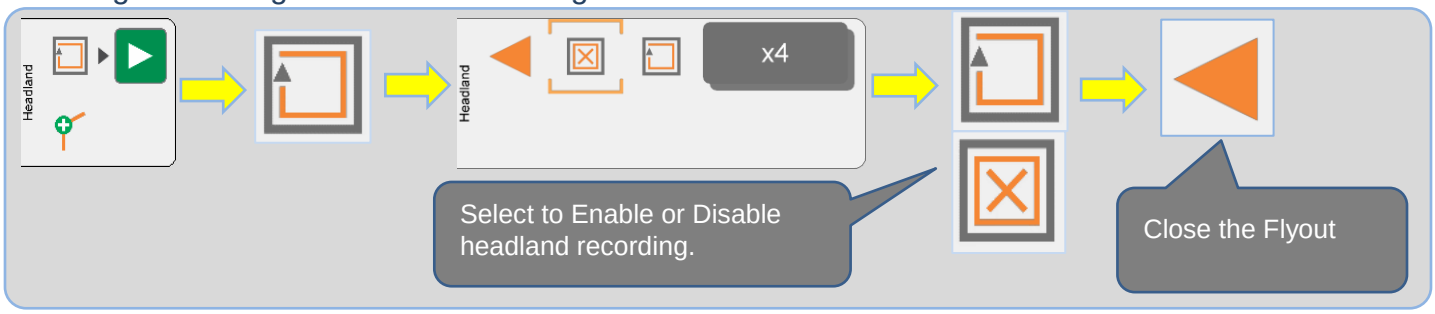
At point 4, a point is set resulting in a straight line segment from point 3 to point 4.

At point 5, headland recording is completed resulting in a straight line from point 4 to point 5. Note that selecting Finish does note automatically close the headland line as observed when performing boundary recording.

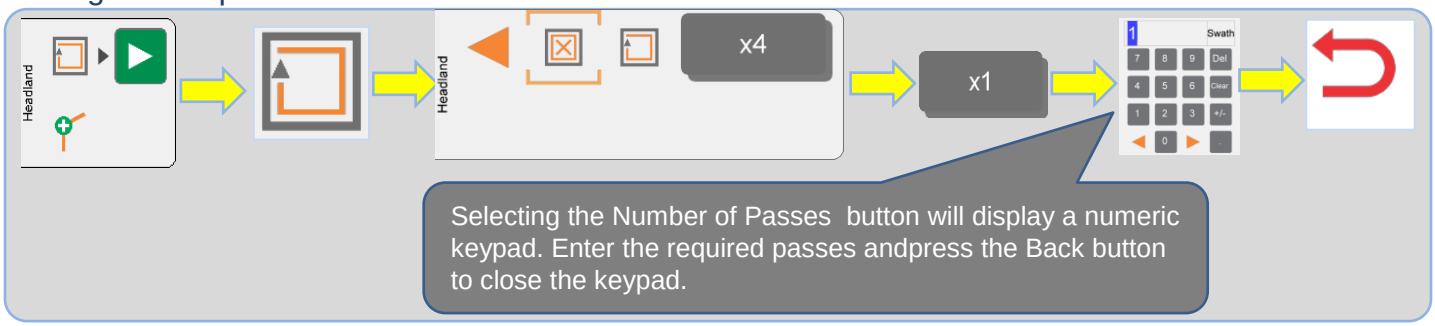
Opening the Headland Recording Menu



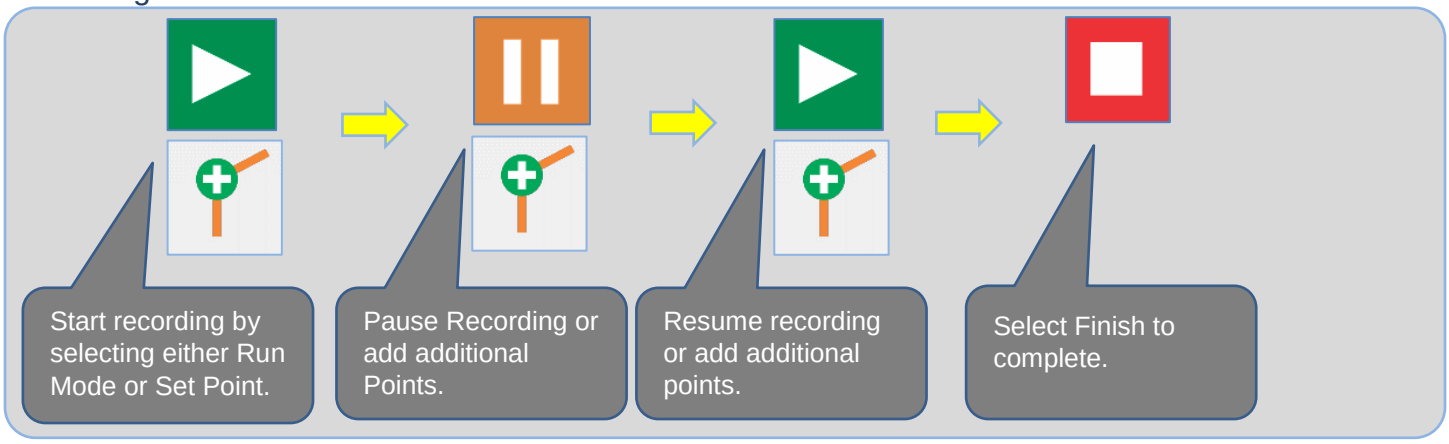
Enabling / Disabling Headland Recording.



Setting the Required Number of Headland Passes



Recording Headland Passes

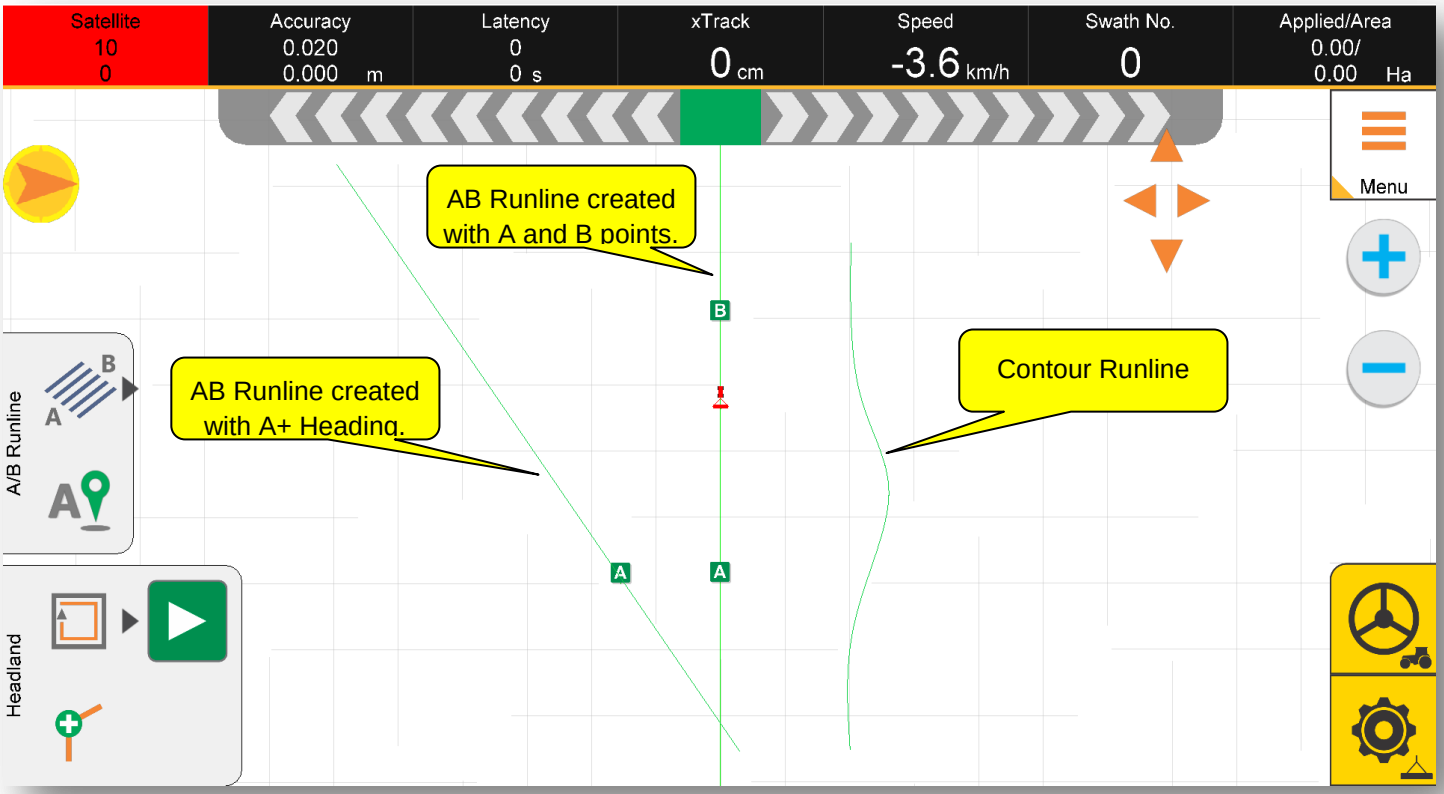


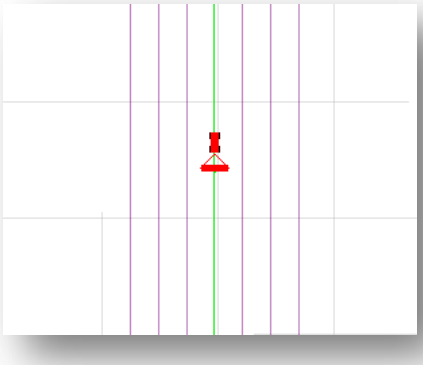
Runlines

Overview

Runlines are guidance paths that can be used by the operator for Visual Guidance, or for Autosteer operations. There are three basic types of runlines:

- AB Straight – This is a straight line defined by two points. Often referred to as “AB Line” or “AB Straight”. An AB runline can be created by either setting “A” and “B” points, or by setting an “A” point and entering a compass heading or bearing for the runline.
- Contour – This is a Line defined by multiple points, and may contain straight and curved sections.
- Pivot – A pivot Runline is a circular path used for Center Pivot irrigation fields.





Current path

mal operation the system will generate Runlines based on the ition relative to the original runline.

Adjacent paths can be displayed, where the current path is displayed in Green, and adjacent paths are displayed in Violet.

The number of a jacent way lines to be displayed can be configured in the vehicle set the current vehicle.

Adjacent paths

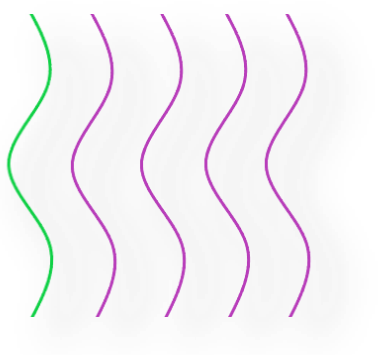
The distance b s can be configured to suit different applications, which can be configured in the Implement Settings page.

Runline Generation Modes

Runlines can be generated by either parallel mode or adaptive mode, dependent on your application. Adaptive mode is only applicable to contour paths. ?

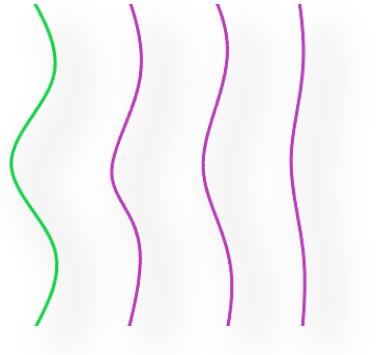
// need to go over as not making sense - changing the multiline button on the recorder menu not intuiutve but seems to affects adjacent path generation. Parallel contour is behaving like adaptive and adptive not working….

Parallel Mode



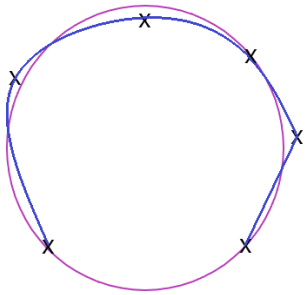
When operating in Parallel Mode, the line is repeated and no smoothing is applied to the line.

Adaptive Mode



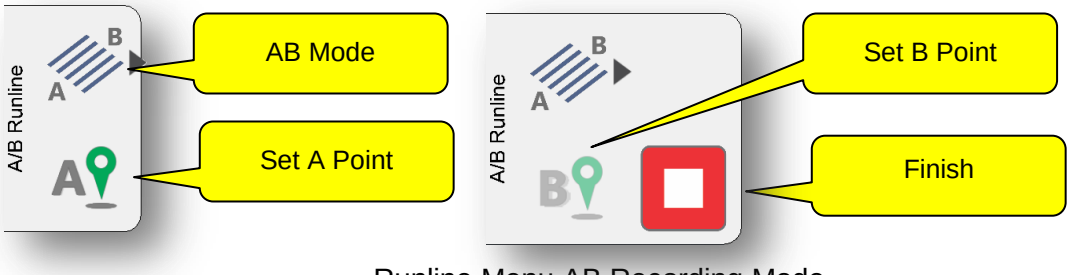
When operating in Adaptive mode, smoothing is applied to the path.

Pivot Mode Recording

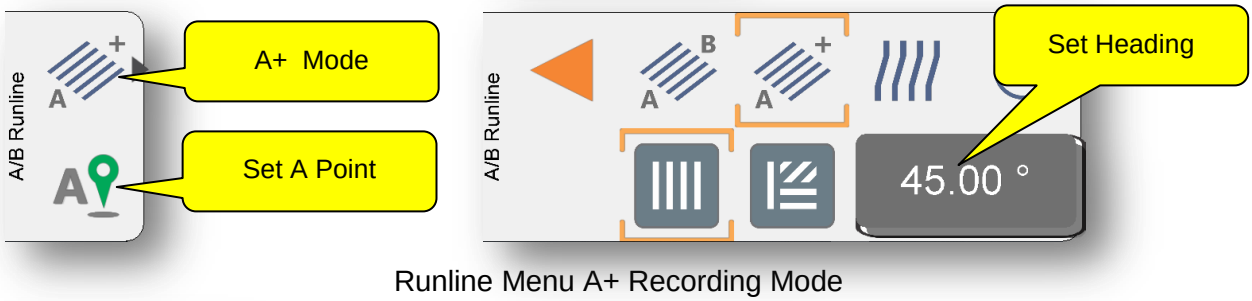


Recording Pivot Runlines can be performed by either setting points, recording the vehicle path or a combination of both. When recording is completed, the Pivot Runline will be generated based on a “Best Fit” to match the recorded path, as shown in the diagram, where the Blue path represents vehicle path and set points, and the violet line represents the generated pivot.

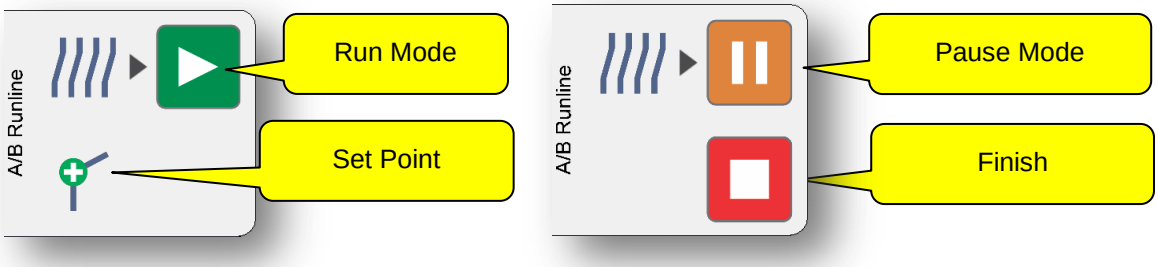
Runline Recorder Menu



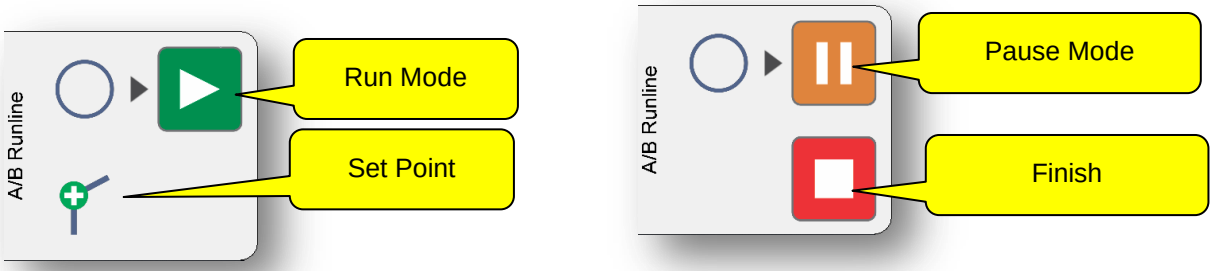
Runline Menu AB Recording Mode



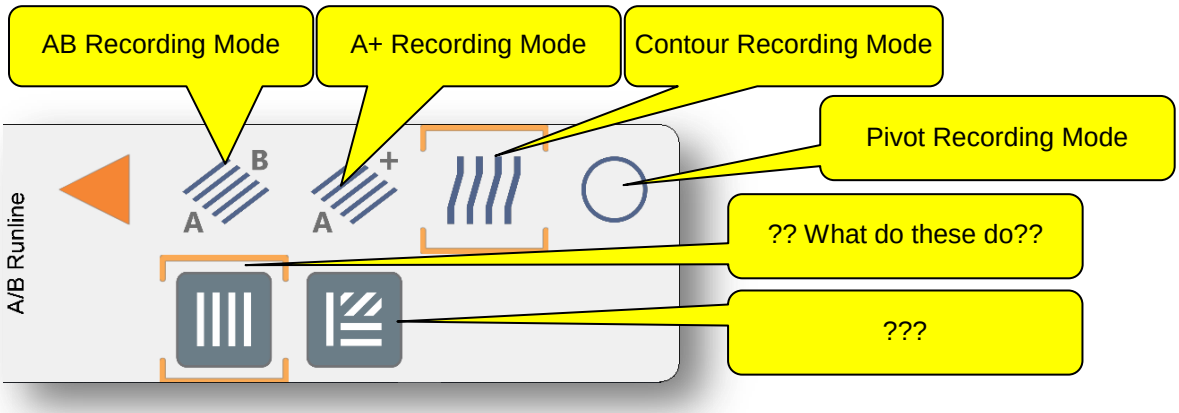
Runline Menu A+ Recording Mode



Runline Menu Contour Recording Mode



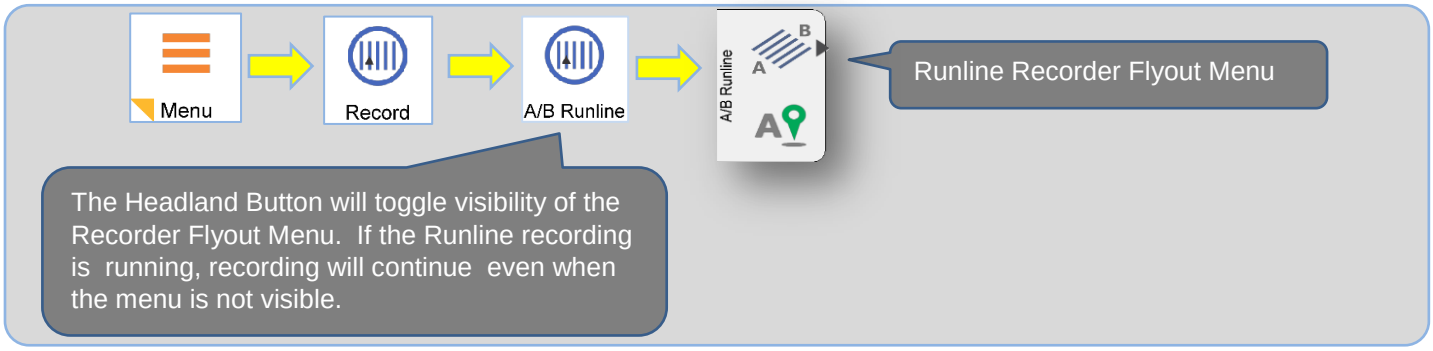
Runline Menu Pivot Recording Mode



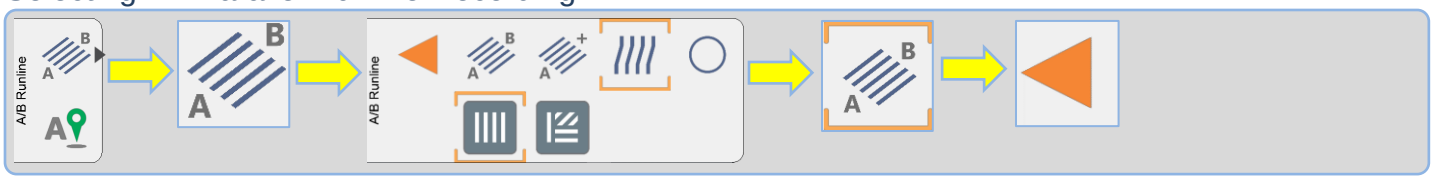
Headland Menu Options Mode

Function	Information
Set A Button	This button indicates if Headland Mode is enabled or disabled. Selecting this button with toggle the menu between recording mode and options mode.
Set B Point	Run/ Pause toggles Headland recording. When paused, no points are recorded.
Set Heading	Enter the heading for the line when recording A+. Selecting this button will display a numeric keypad.
Finish Button	Finish will complete. For AB this will cancel recording operation.
Run Mode Button	Run mode will record a series of points for the runline.
Pause Button	Pause Mode will suspend point recording. On resume by either Run or set point a segment will be created from the last recorded point.
Set Point Button	Adds a single point to the Runline. This creates a line segment between the new point and the last recorded point.
Other button	???
Other Button	?????

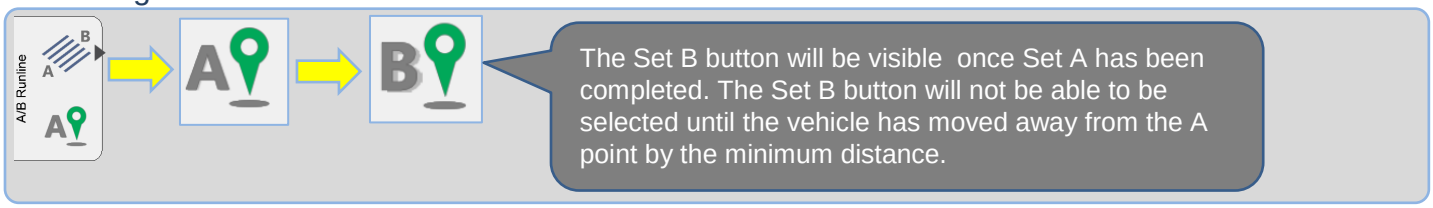
Opening Runline Recording Menu



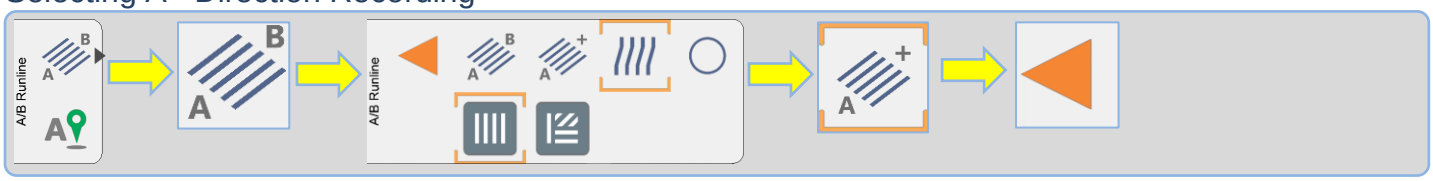
Selecting AB Parallel Runline Recording



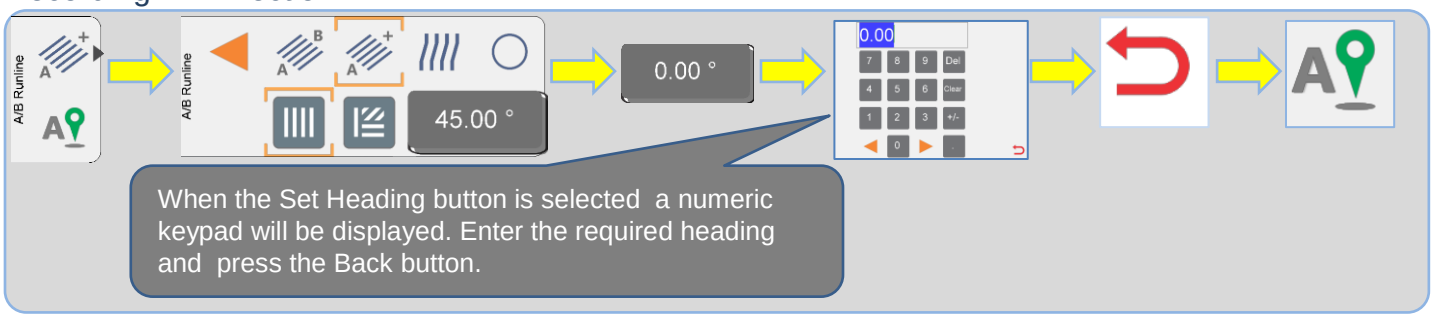
Recording AB Parallel



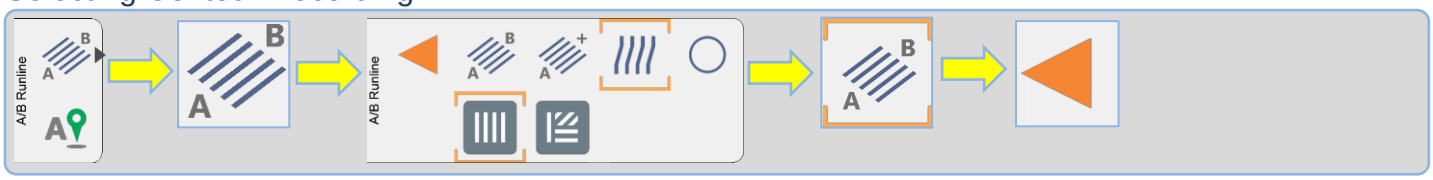
Selecting A+ Direction Recording



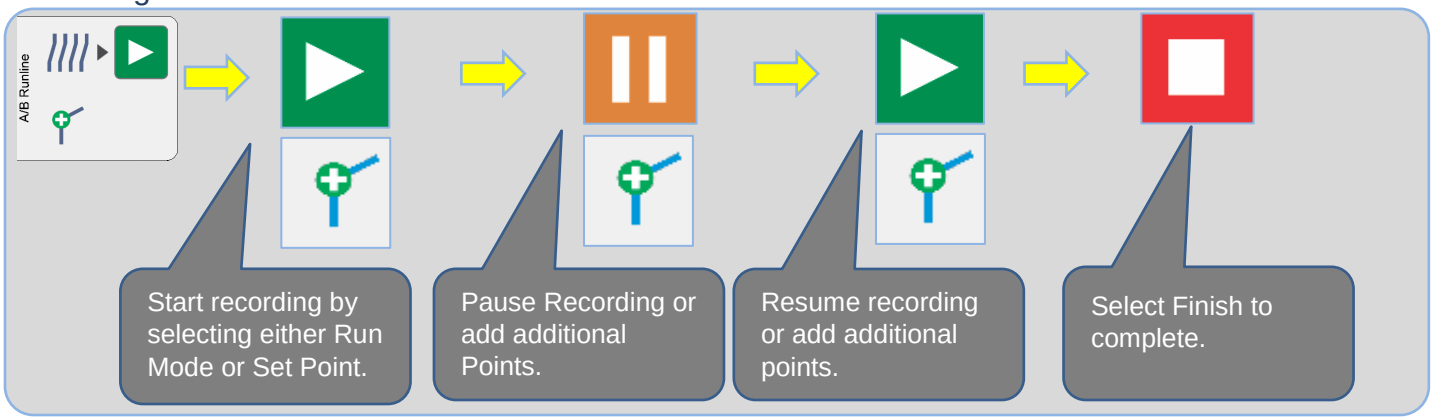
Recording A+ Direction



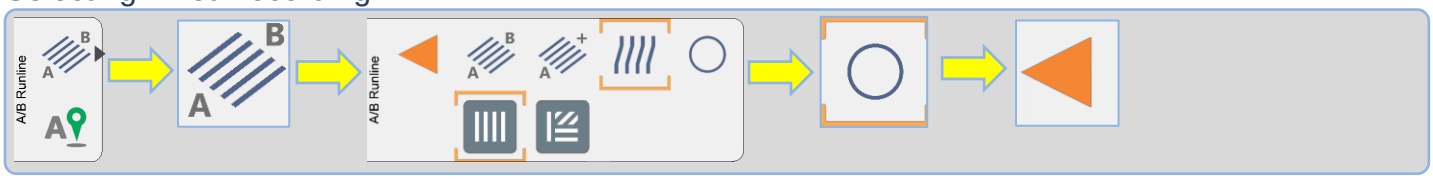
Selecting Contour Recording



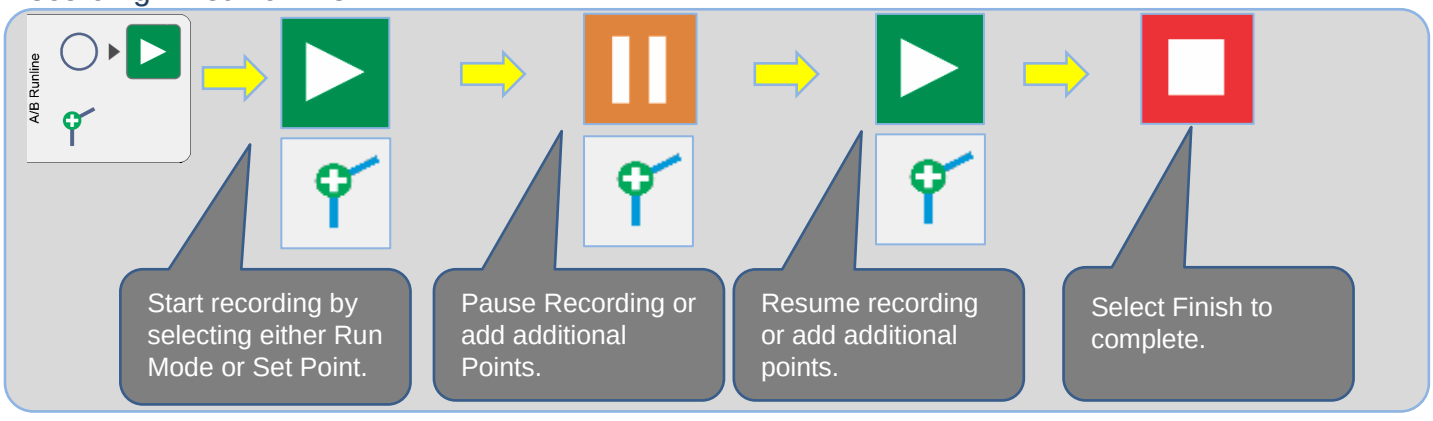
Recording Contour Runline



Selecting Pivot Recording



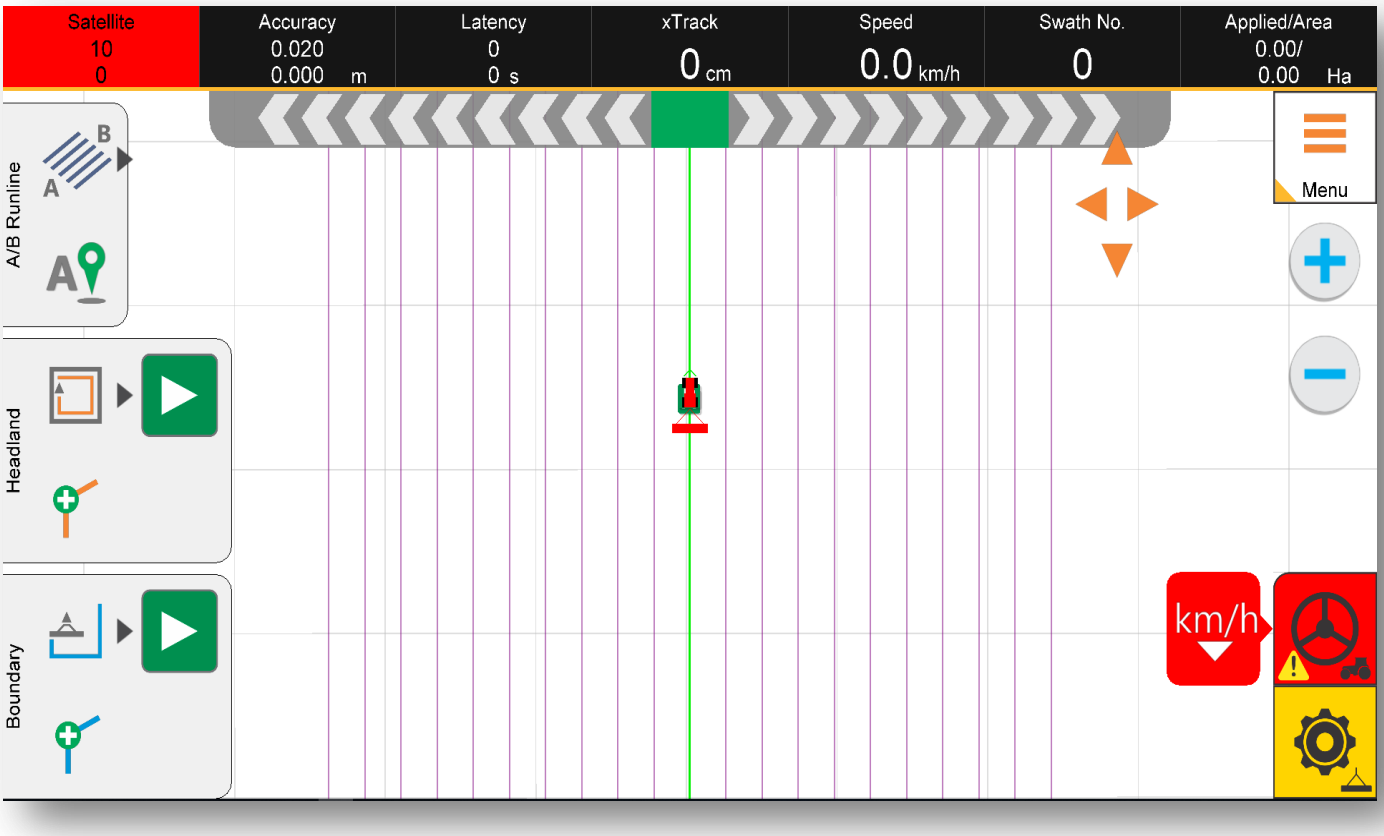
Recording Pivot Runline



// AB Finish doesn’t cancel…. Doesn’t respect minimum distance of Set B. Should it be visible?

Advanced Operations

AgGuide allows the operator to perform Runline, Boundary and Headland recording simultaneously, allowing for all field data to be created in a single operation.



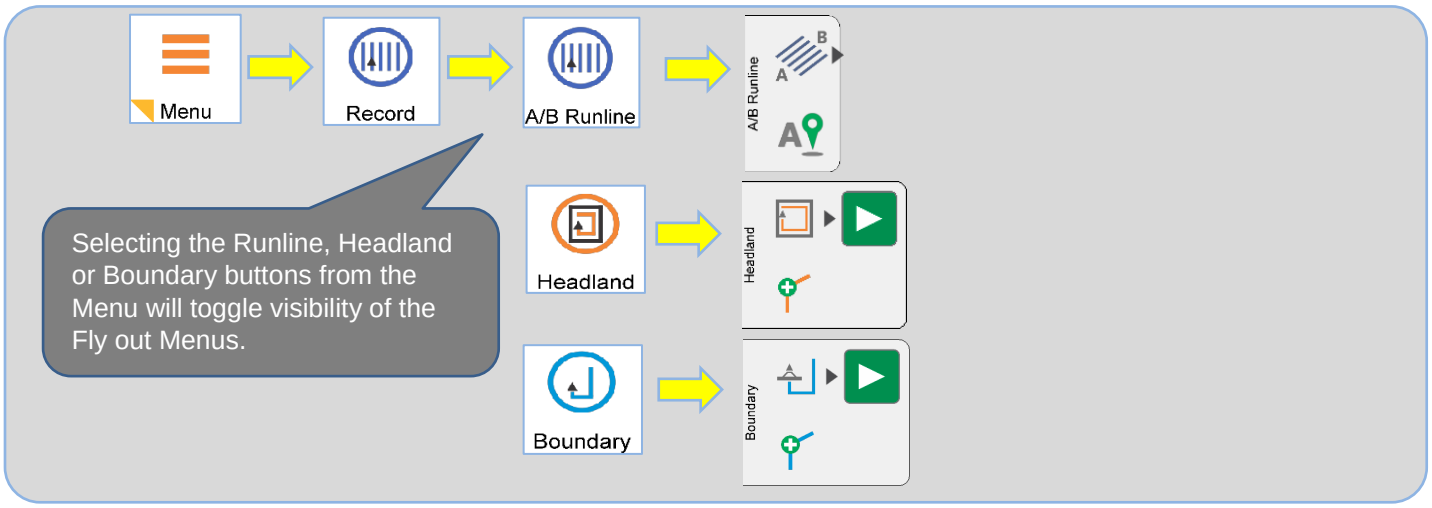
Using this option, the following can be performed:

- A runline can be created and used for Autosteer and boundary Recording to ensure accurate boundary placement.
- Headland Passes can be created during boundary creation, with additional Headland passes created for different operations or implement configurations.
- Contour and AB Runlines can be created at the same time as boundary recording.

The procedure for using the functions simultaneously does not alter.

Enabling Simultaneous Recording

The following sequence details how to enable the Recording menus.

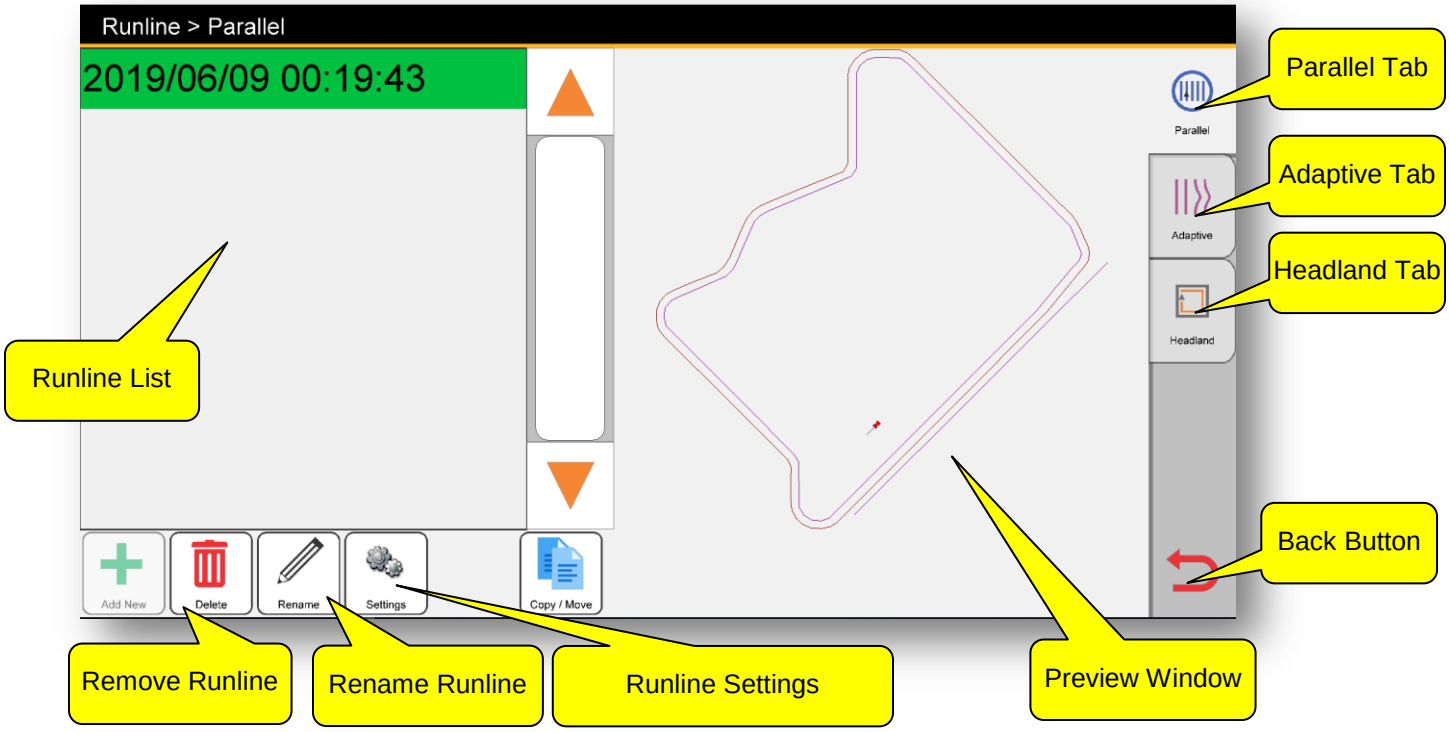


Recording Point

When performing simultaneous recording of boundaries and Runlines or Headland Line the recording point for the boundary is independent of the Runline or Headland Line recording point. The recording Point for boundary can be selected from the Boundary Recording menu.

Selecting and Managing Runlines

Runlines can be displayed for a selected field from the Runlines menu. This page allows for Runlines to be edited and copied between fields or in the same field to create new lines for different operations or implement configurations.

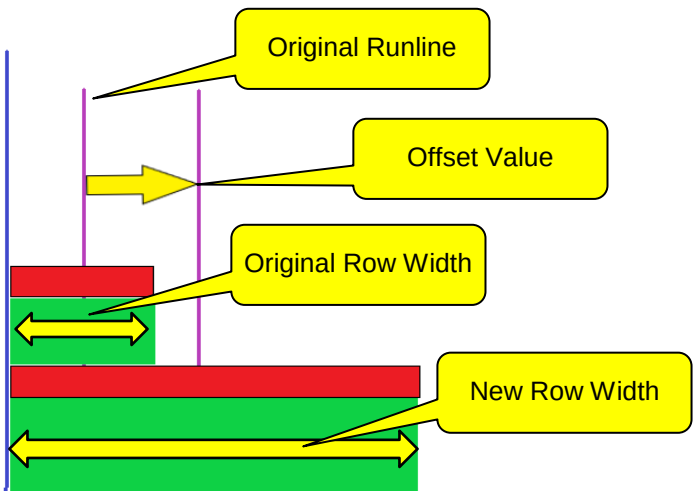


Function	*Information*
Parallel Tab	The Parallel Tab will display Parallel Runlines page. Changing the selected Runline will select the Runline in the Job and mapping Window.
Adaptive Tab	The Adaptive Tab will display Adaptive Runlines page. Changing the selected Runline will select the Runline in the Job and mapping Window.
Headland Tab	The Headland Tab will display Headland Passes page. Changing the selected Headland will select the Headland pass in the Job and mapping Window.
Preview Window	The preview Window shows the Field boundary and all associated Runlines and Headland Passes. Items selected in the list will be highlighted in the preview window.
Back Button	Closes the page and returns to the main window. Any changes in selection will persist.
Runline List	Displays a list of Runlines for the selected Tab.
Add	Button is not enabled.
Delete	Deletes an existing runline.
Rename	Changes name of the selected runline
Settings	Runline settings allows you to change the Row Width and Offset for the selected runline.
Copy / Move	Copy Move allows you to Create a copy of the selected runline. This can then be renamed or copied to a different Field.

Runline Row Width and Offset

Each Runline has a Row Width and Offset Value. By default, the offset will be zero and the row Width will be the implement width when the runline is recorded.

When a runline is to be used for multiple operations with differing implement widths, it may be necessary to adjust these values or copy and edit the runline for different applications.



In the example shown, the original line was recorded with a 3m wide implement. To use runline with an implement that is 10m wide, the Runline width and offset need to be changed.

If the 3m implement original Line was recorded at 1.5 m from the boundary (Blue Line) the line position for the 10m implement needs to be 5m from the boundary line. The difference between these positions is the required offset.

Ie. 5m – 1.5m =3.5m.

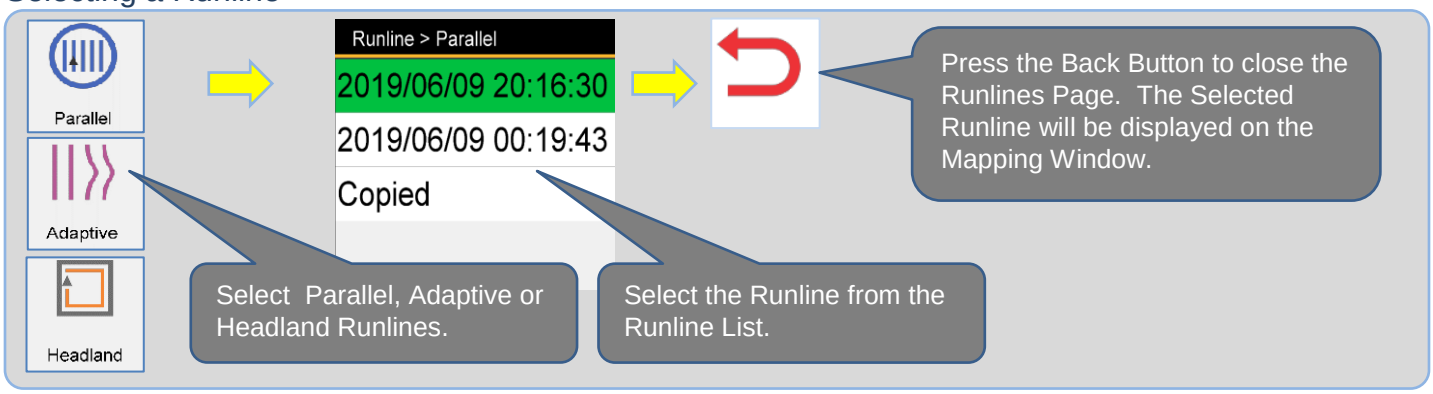
Offset values to the right of the original lines are positive, '+', and values to the left are negative '-'.

To generate the runlines to suit the 10m implement, the Row width value can be changed from 3m to 10m.

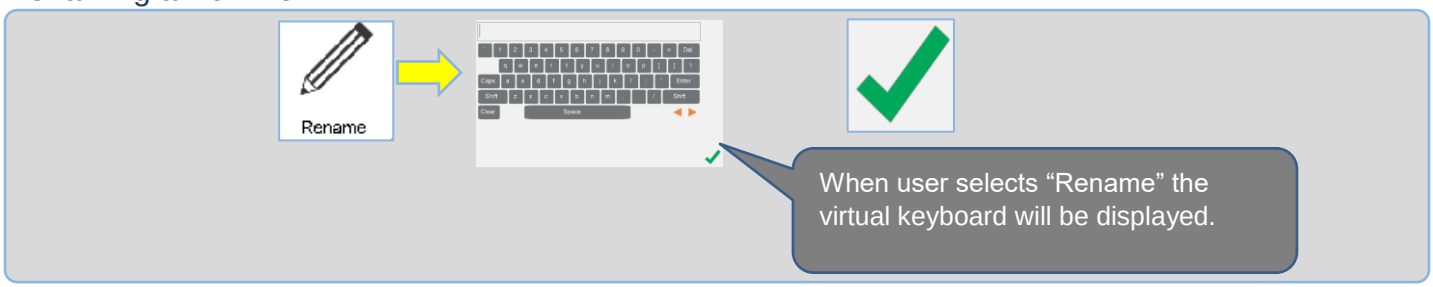
To adjust these values, refer to Changing the Runline Row Width or Changing the Runline Offset.

Opening the Runlines Page

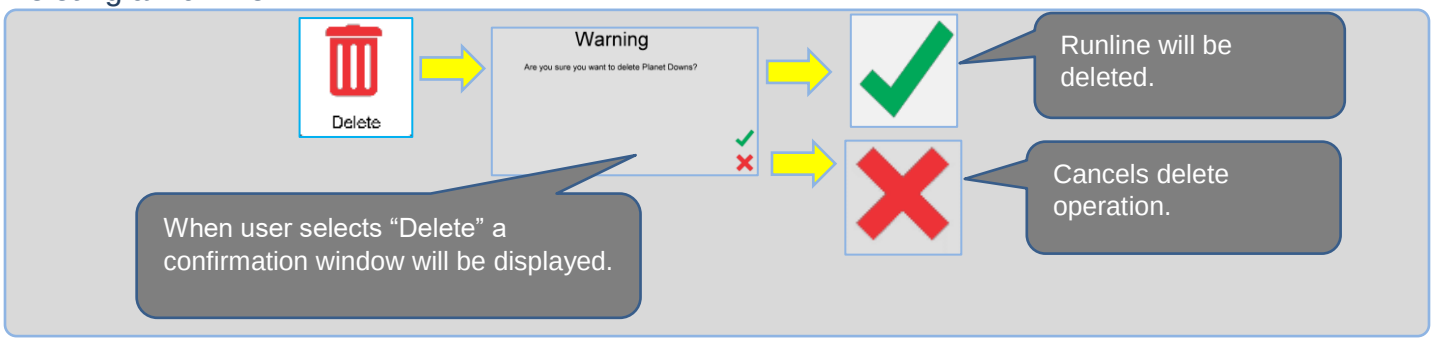
Selecting a Runline



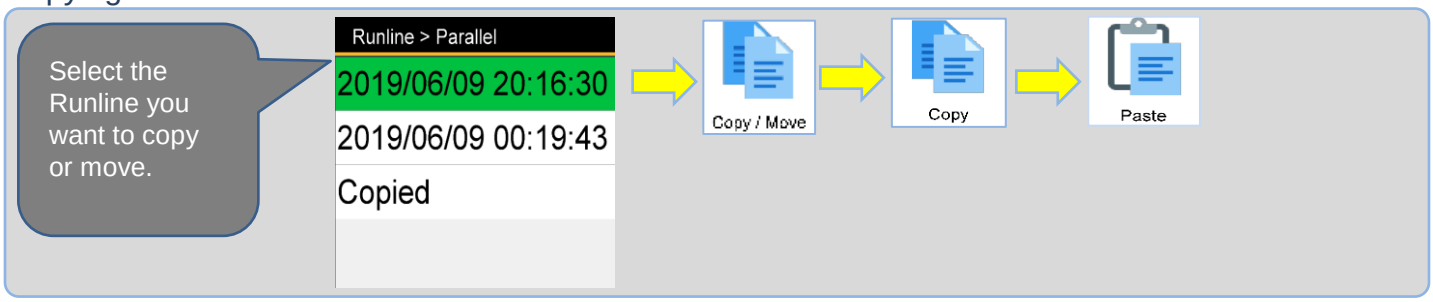
Renaming a Runline



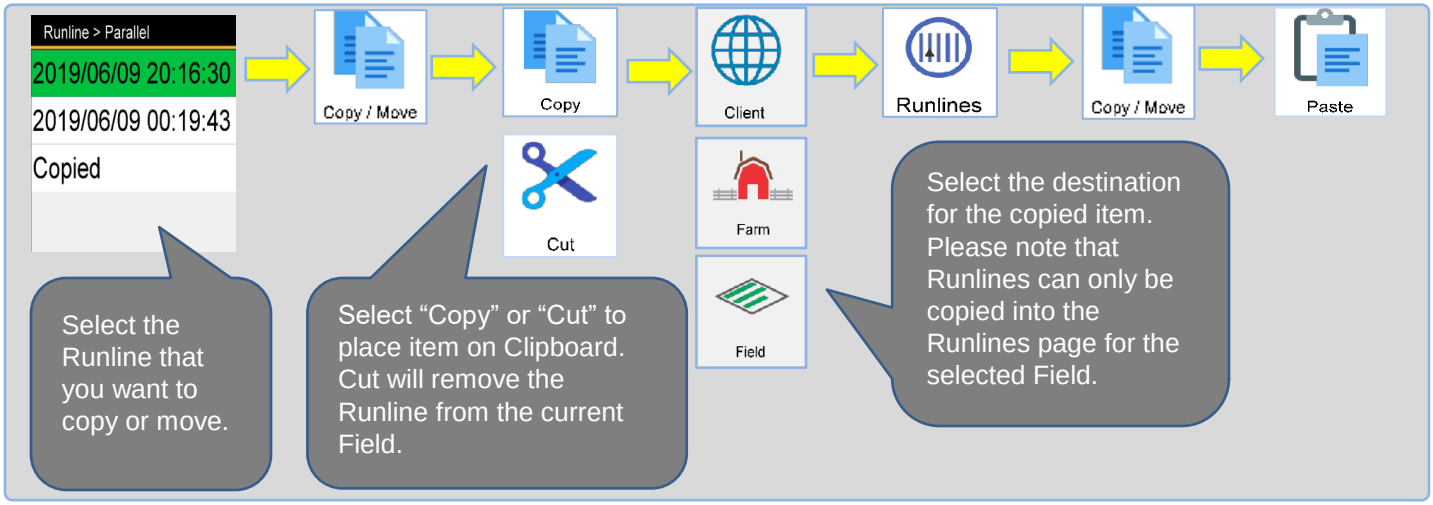
Deleting a Runline



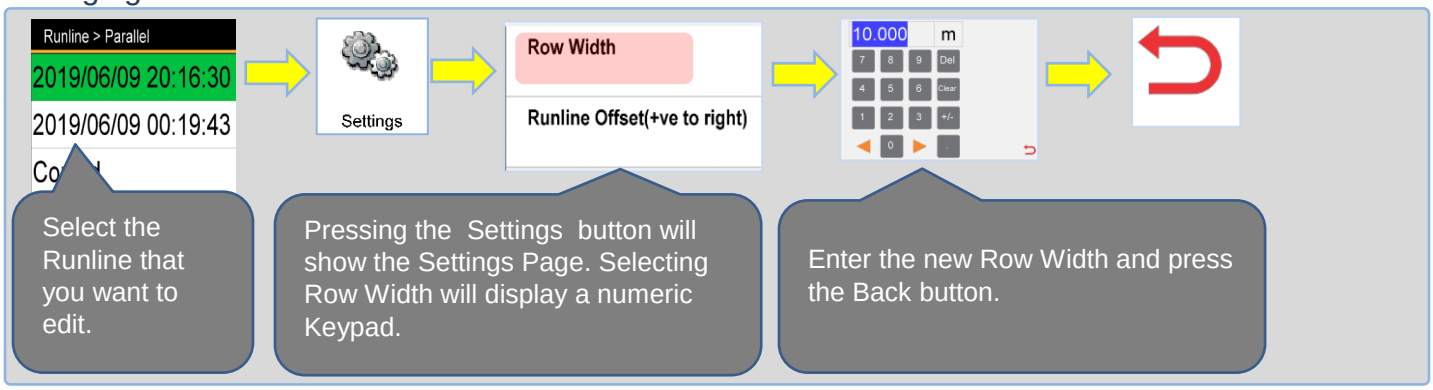
Copying a Runline within same Field



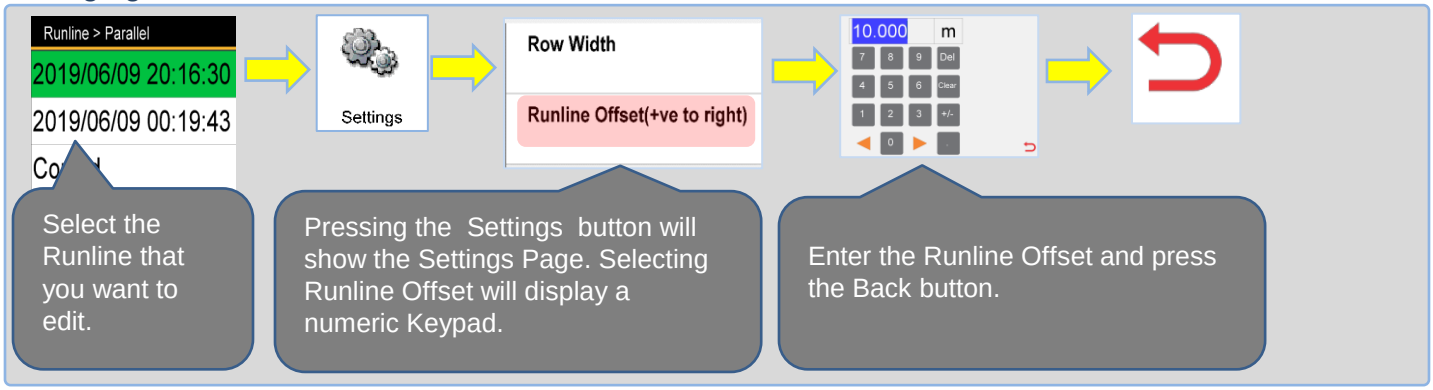
Copying and Moving Runlines



Changing the Runline Row Width



Changing the Runline Offset.

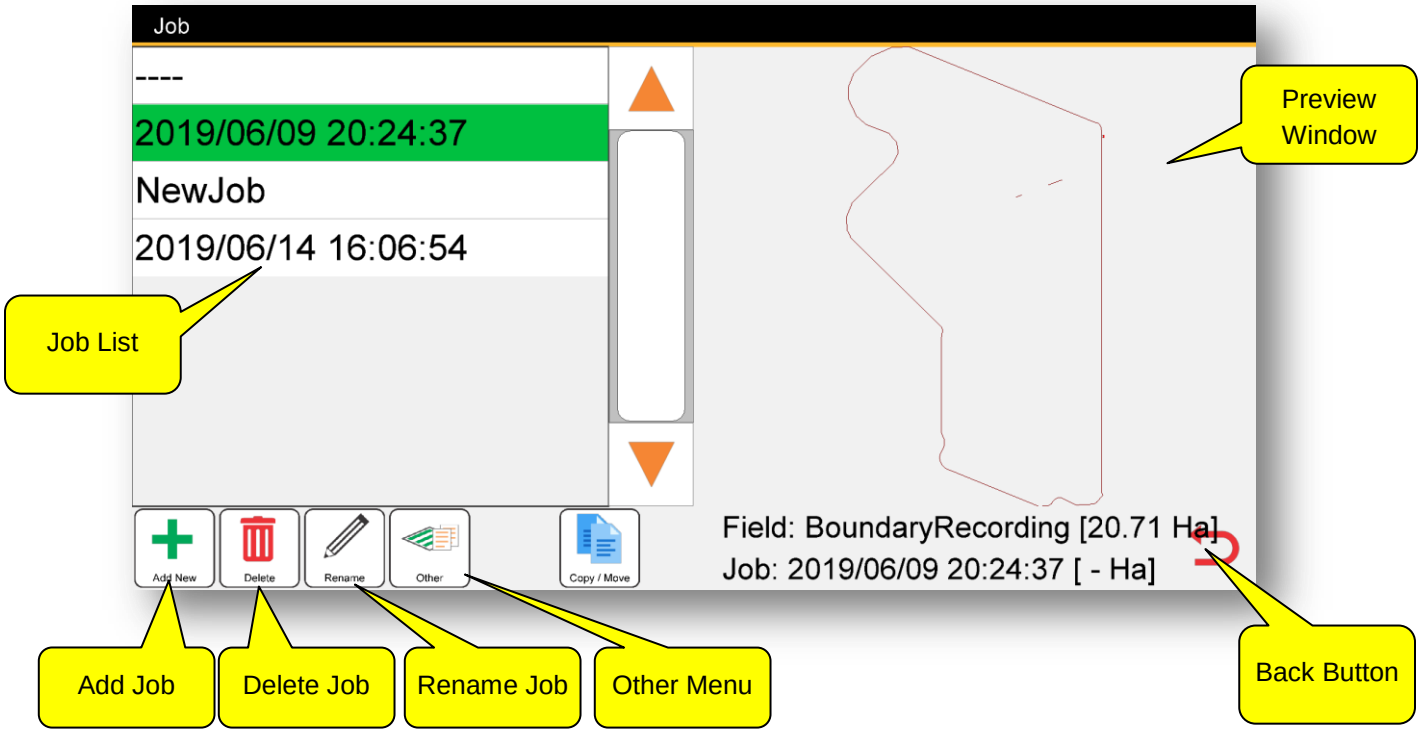


WORKING WITH JOBS

// Product, implement etc aren't in the job like V4?

//Cant associate plan, product with Job?

Overview

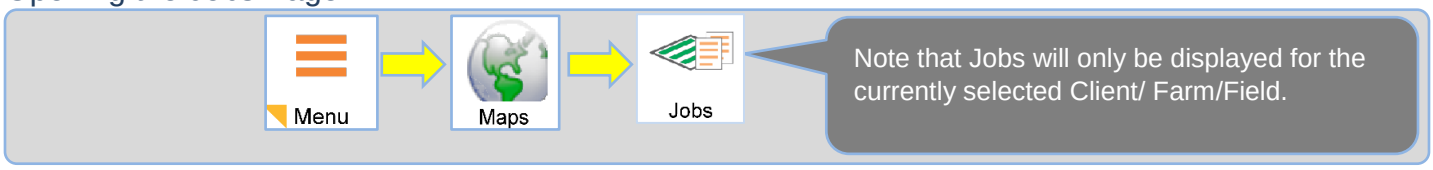


Function	*Information*
Preview Window	The Preview Window shows the field associated with the Job. If the Job has need started , any previously applied area will be displayed.
Back Button	The Back button closes the Jobs page and returns to the main screen. The selected Job will become the Job displayed in the main screen.
Add Button	Adds a new Job to the currently selected Field.
Delete Button	Deletes the Job. All Job data will be removed.
Rename Button	Renames the Selected Job. When selected a virtual keyboard will be displayed.
Other Button	Displays Other menu for Job statistics, Export of Coverage and Trail Maps.

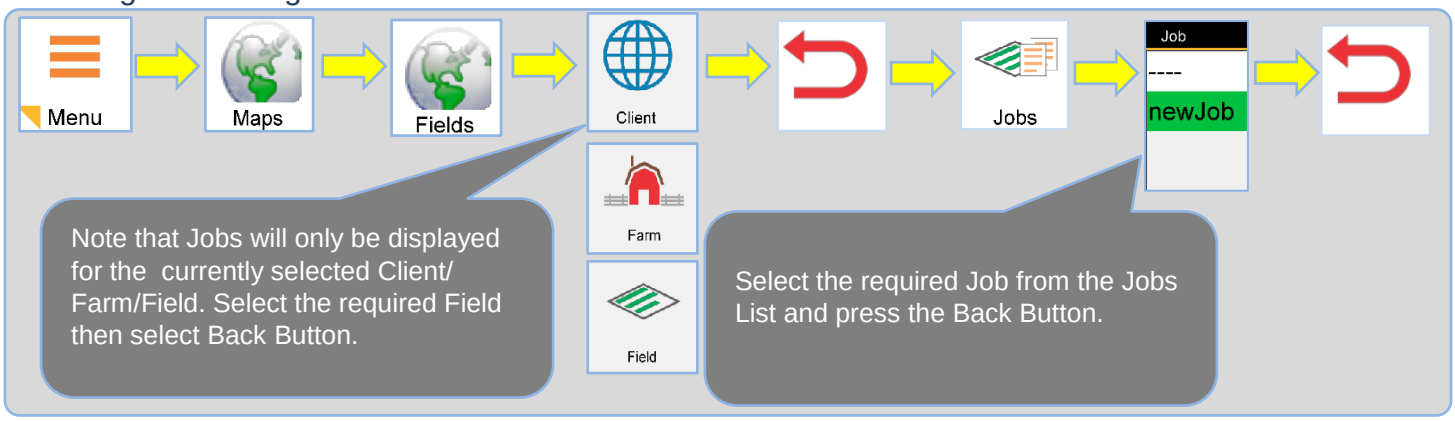
Creating Jobs.

A job can be created manually, or if no Job is selected, a new job will be created automatically when an area is applied within a field. When created automatically the Job name will be recorded as the Date and time the Job was started, in the following format: YYYY/MM/DD HH:MM:SS.

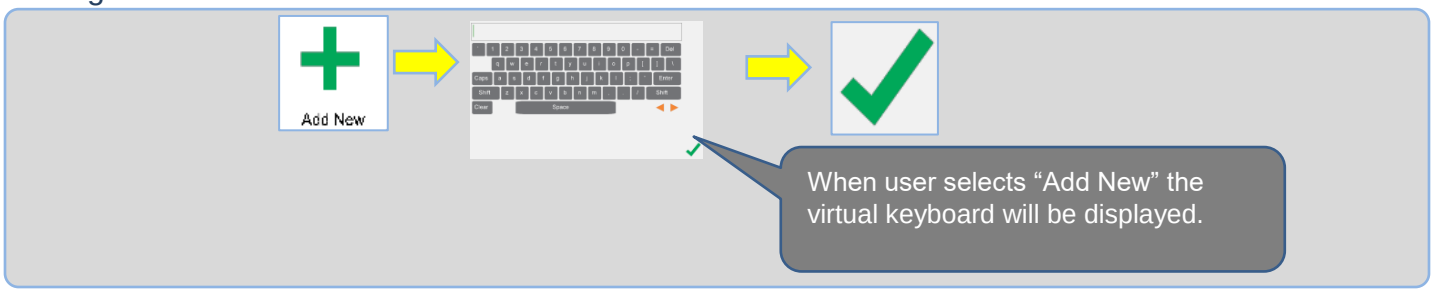
Opening the Jobs Page



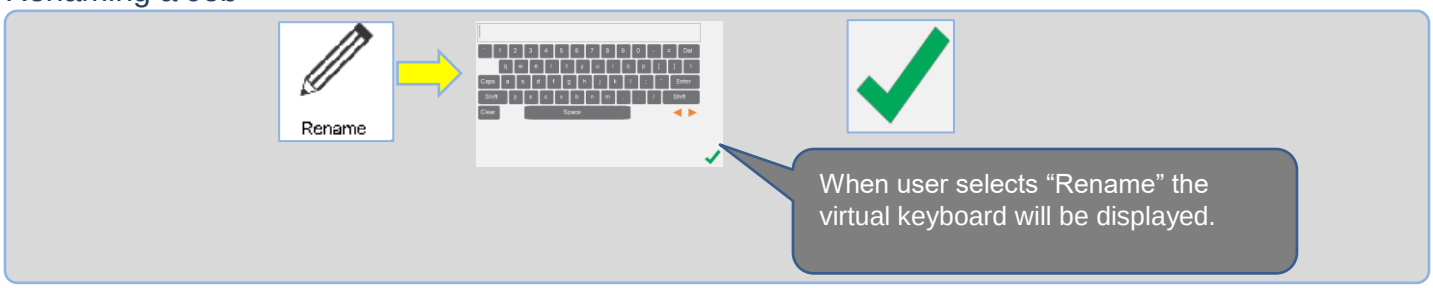
Selecting an Existing Job



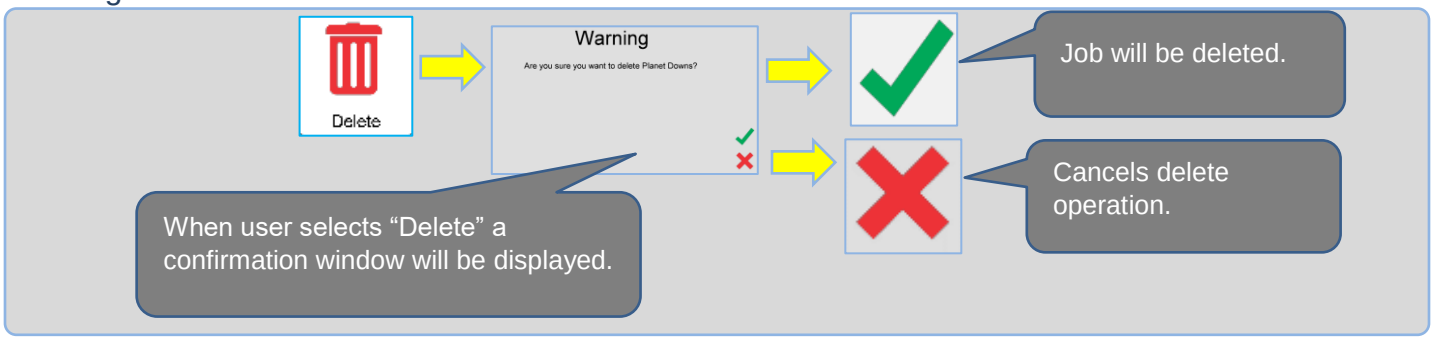
Adding a new Job



Renaming a Job



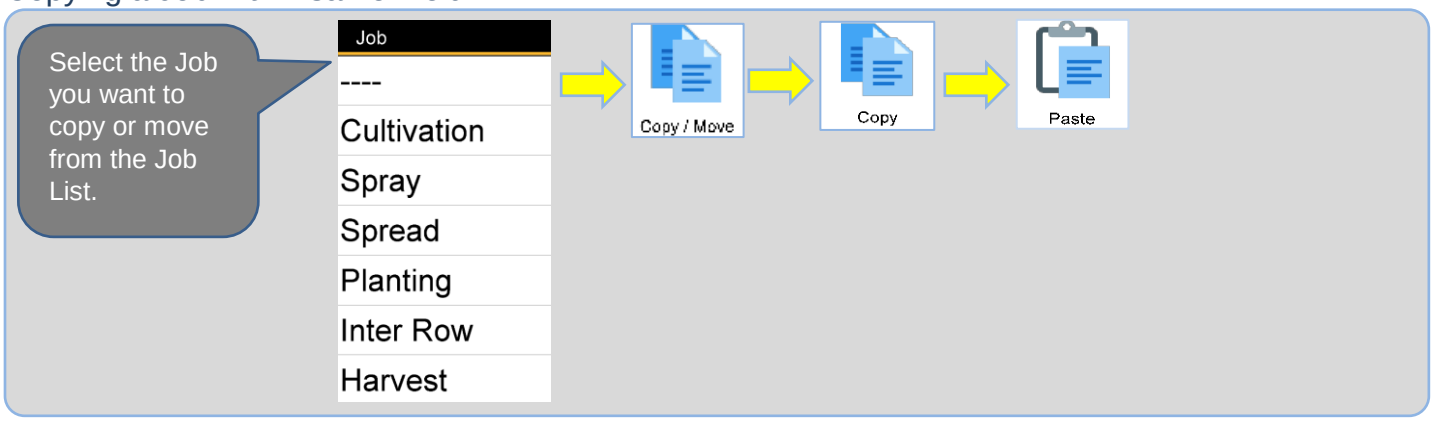
Deleting a Job



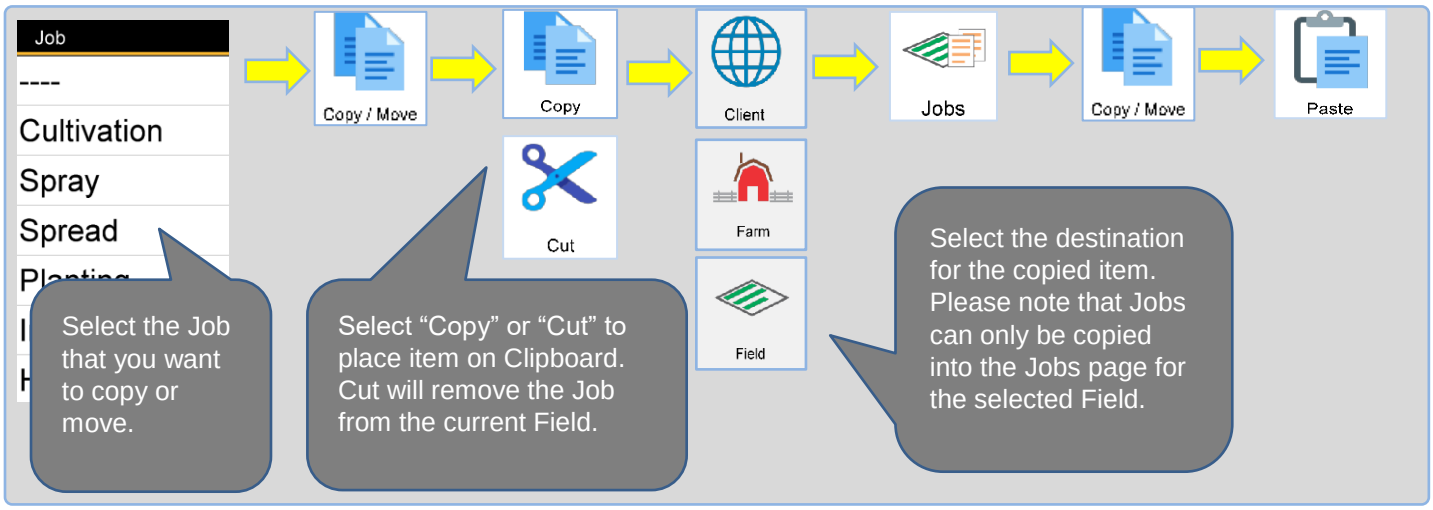
Warning!

Deleting a Job will remove all recorded data associated with the Job.

Copying a Job within same Field



Copying and Moving Jobs



Other Job Operations

Export Coverage

Job Data can be exported as a universal 'Shape' (.shp) files. This allows interchange of field information with external applications such as Farm Management Information Systems (FMIS).

Export Trail

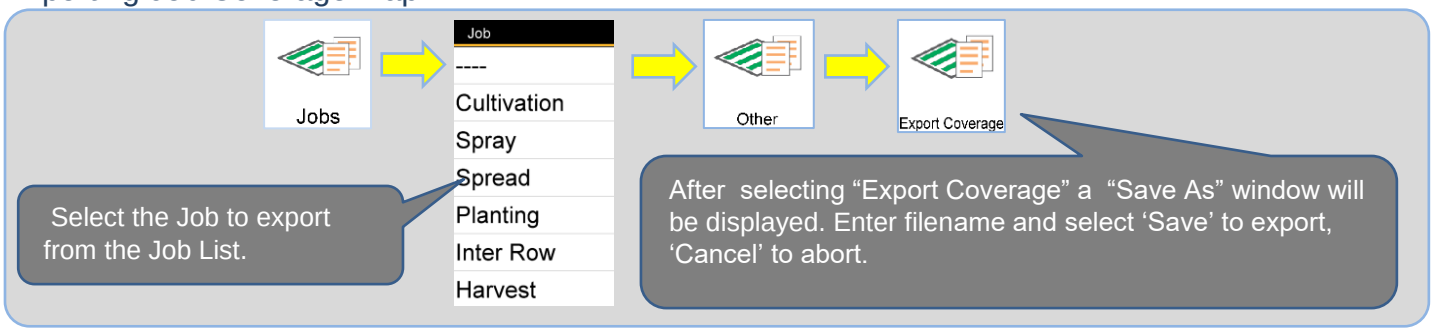
The vehicle/ implement recoded path can be exported as either a shape file, or as an EziGrade file for use by levelGuide.

Statistics

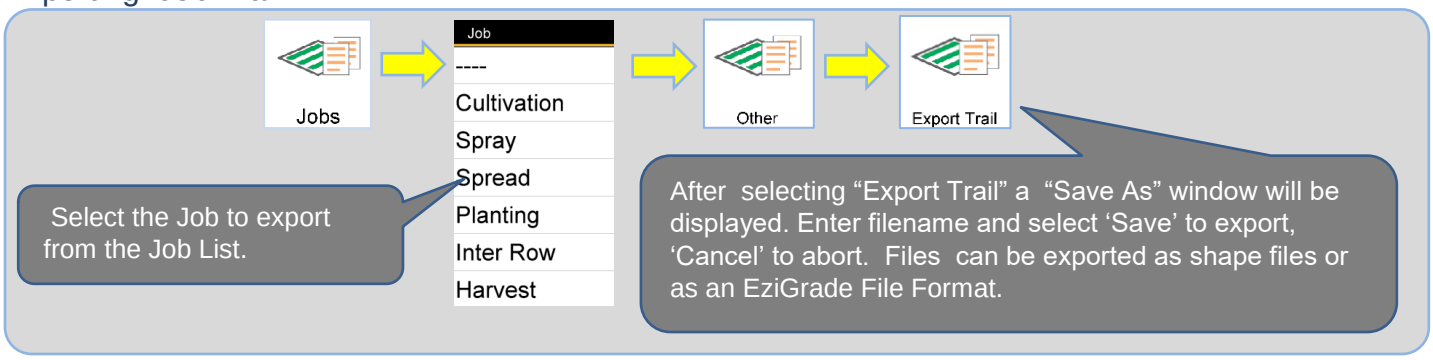
Selecting the Statistics Button will open a new window displaying Job Statistics including the following:

- Date Time the Job was created,
- When the Job was executed,
- Active? hours
- Applied ? hours
- The Driven Area,
- The Applied Area
- Overlapped Area
-

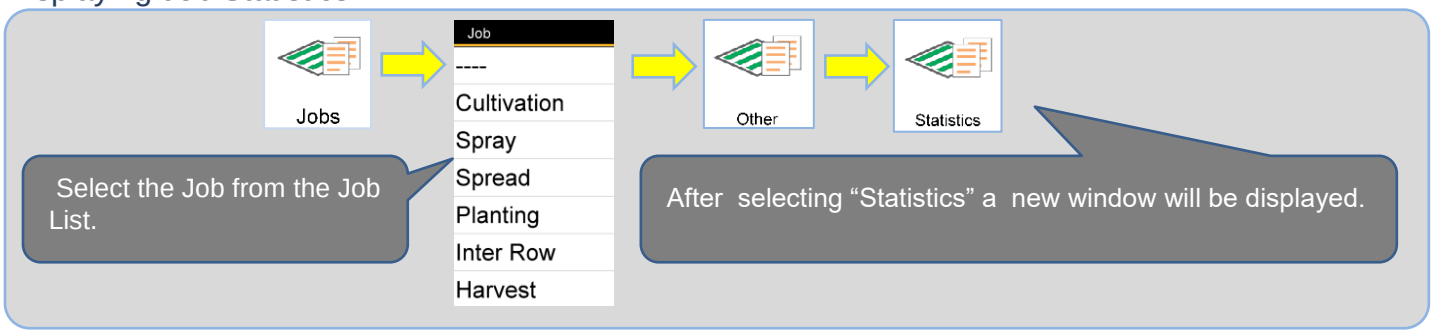
Exporting Job Coverage Map



Exporting Job Trail



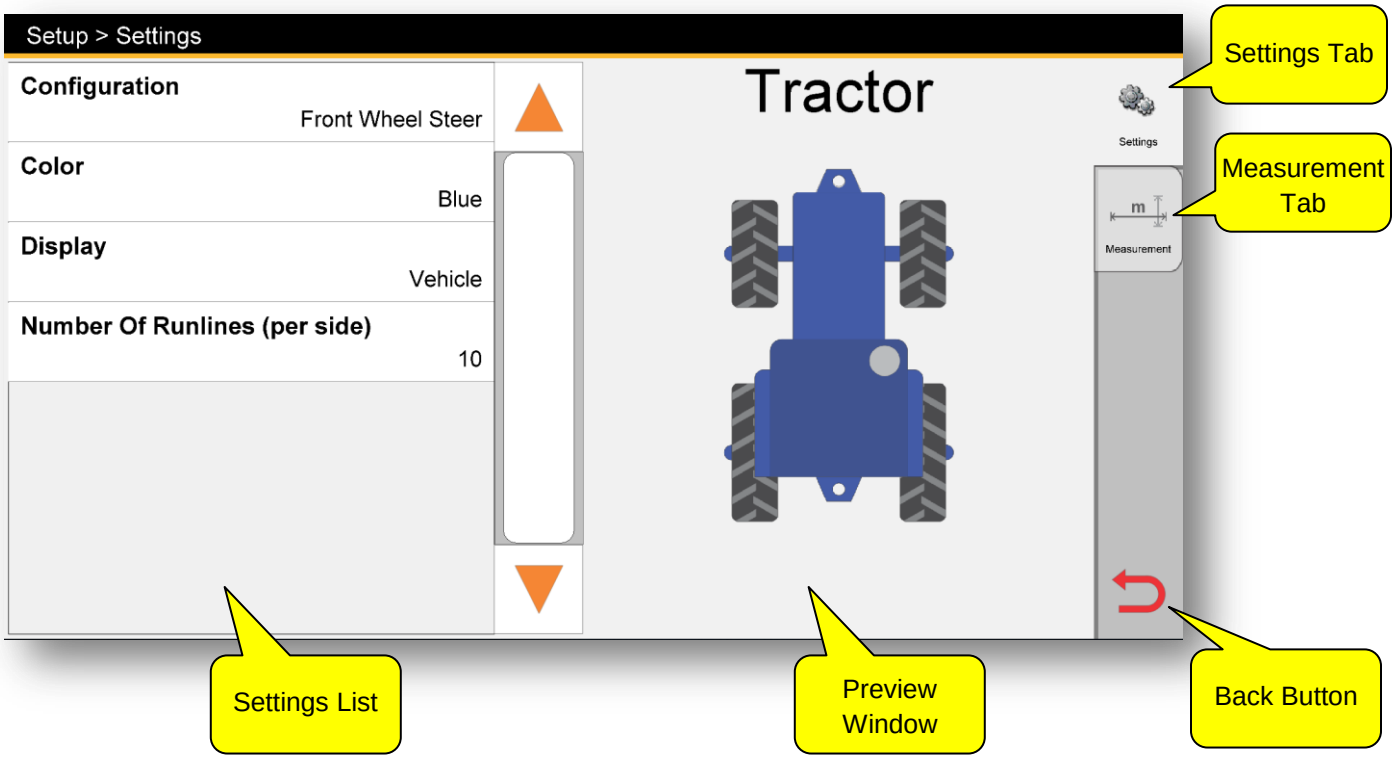
Displaying Job Statistics



// As and interim included Vehicle and Implement Setup pages. Thes should move to Vehicle and Implement Config for final release.

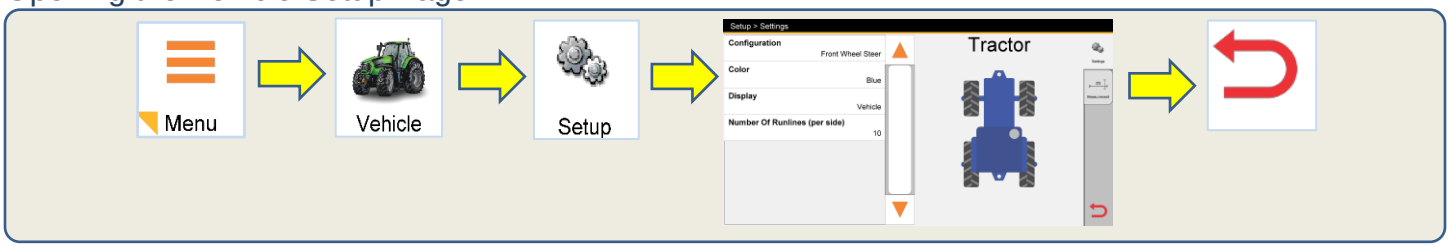
VEHICLE CONFIGURATION

Overview



Function	*Information*
Settings Tab	Selecting the Settings Tab will display the Vehicle Settings Page.
Measurement Tab	Selecting the Measurement Tab will display the Vehicle Measurements Page.
Settings List	The Settings List displays the configuration options for the vehicle.
Back Button	Selecting the Back Button will close the Settings page and return to the Mapping Window. Any changes to vehicle setup will persist.
Configuration	This will set the Vehicle type. Options are: • Front Wheel Steer • Rear Wheel Steer • Tracked • Articulated
Color	This option will set the display color for the Vehicle on the Mapping page.
Display	This option will select the image displayed on the Mapping window. Options are Vehicle or Arrow.
Number of Runlines	This option will select how many Runlines are displayed each side of the current runline in the Mapping Window.

Opening the Vehicle Setup Page

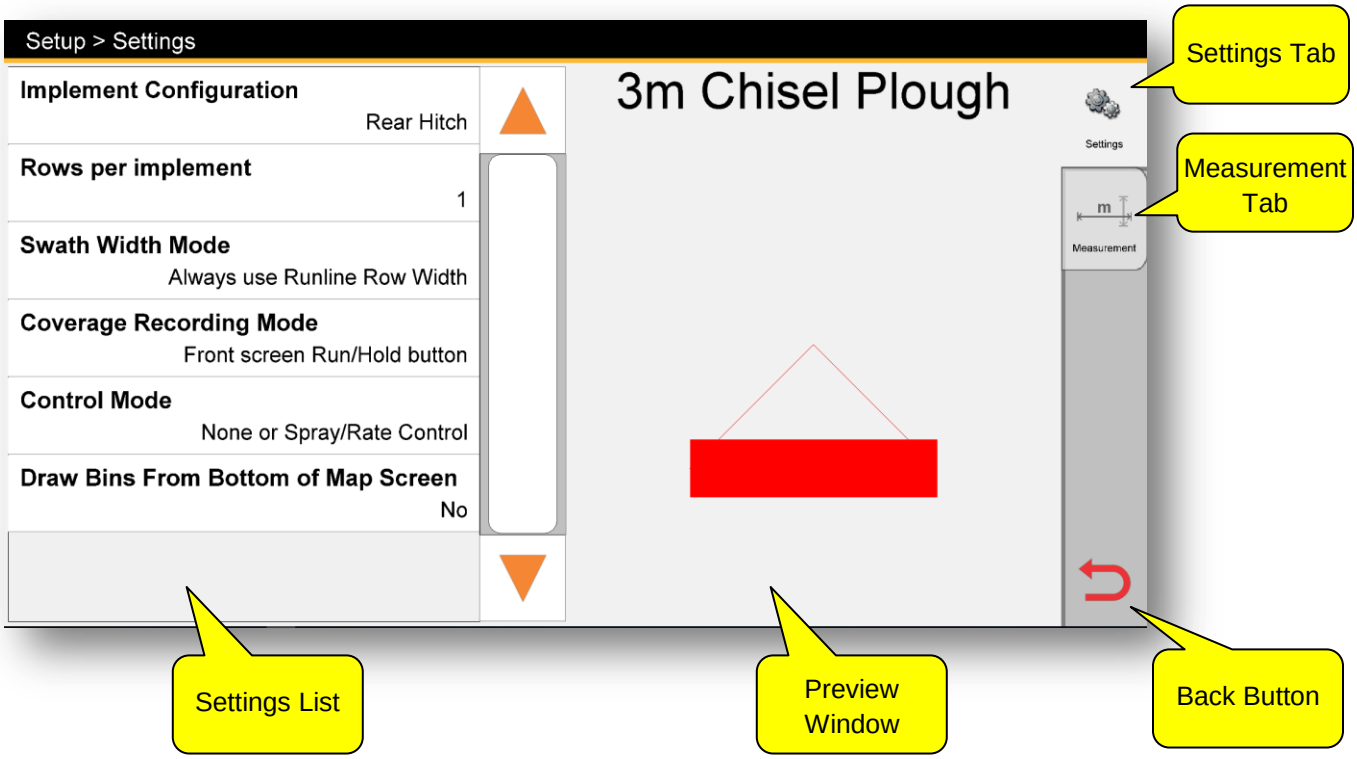


Important Information.

Changes to Vehicle Configuration or Vehicle measurements may have an adverse affect on System performance or accuracy. These values are set during installation on the vehicle and should only be changed by a suitable qualified person.

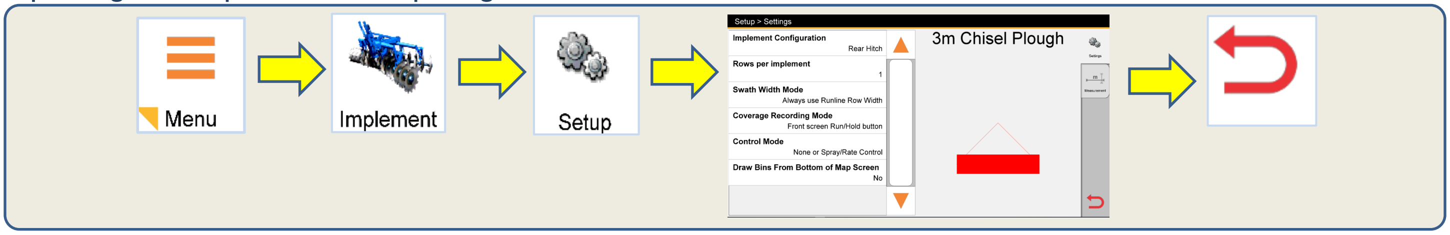
IMPLEMENT CONFIGURATION

Overview



Function	*Information*
Settings Tab	Selecting the Settings Tab will display the Implement Settings Page.
Measurement Tab	Selecting the Measurement Tab will display the Implement Measurements Page.
Settings List	The Settings List displays the configuration options for the Implement.
Back Button	Selecting the Back Button will close the Settings page and return to the Mapping Window. Any changes to implement setup will persist.
Configuration	This will set the Implement mounting configuration.
Rows per Implement	??
Swath Width Mode	This option selects if the implement width or Runline Row Width is used in swath generation.
Coverage Recording Mode	This option sets the applied area behavior for coverage mapping.
Control Mode	This option selects if the implement is to be used with an external controller such as LevelGuide or VRC.
Draw Bins from Bottom of Map Screen	This option selects whether the Bins (if configured) are to be displayed on the screen.

Opening the Implement Setup Page



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WORKING WITH PLANS

Overview

What are plans… prescription Maps, levelGuide cut fill, etc.

Prescription Map

Adding Prescription Map

Edit Prescription Map

Using Prescription Map with Implement…

Level Guide Control Plans

GPS CONFIGURATION

Novatel Configuration

Topcon Reciver Conf

Base Station Config

External GPS

Nema Out for external devices 0183, NEMA 2000?

VEHICLE CONFIGURATION

Creating a Vehicle

Vehicle Dimensions

Vehicle GPS configuration

Steering System Configuration

WAS Calibration

Nav Module Configuration

Tuning

Troubleshooting

IMPLEMENT CONFIGURATION

Creating an Implement

Implement Dimensions

Implement GPS Configuration

Configuring Bins and Tanks

Configuring Sections

Configuring External Controllers

STEERING SYSTEM CONFIGURATION

Standard / Farmscan

Steering Wheel Motor

PVED CL

AGCO/CAT Challenger M/T

AGCO/Fendt Vario

CLAAS Lexion 770

CNH/ Austoft Tracked Hydraulic

LEVEL GUIDE