









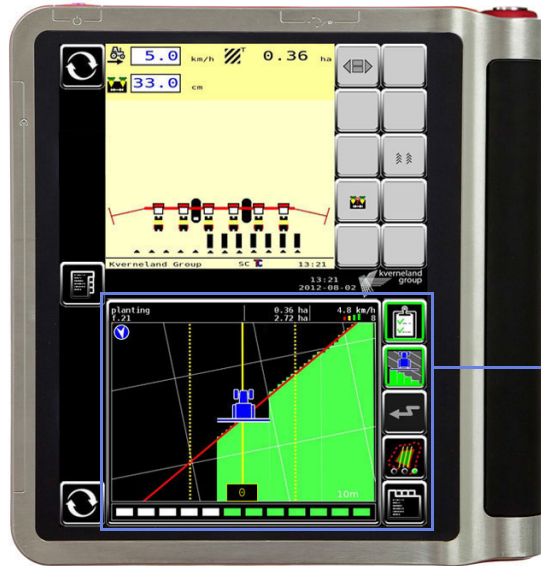
# IsoMatch GEOCONTROL

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# Overview of the application



## IsoMatch GEOCONTROL

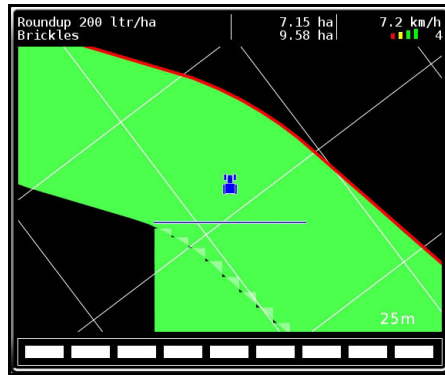
IsoMatch GEOCONTROL is an application integrated in the IsoMatch Tellus/IsoMatch Tellus PRO terminal, providing

- Automatic section control
- Variable rate application
- Task management and documentation
- Manual guidance (in combination with IsoMatch Inline)

• GEOCONTROL application

# Automatic section control

## Based on overlap



The application records current coverage of the implement and will automatically shut off the implement sections when overlapping.

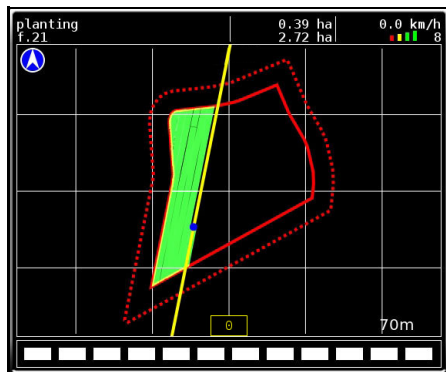
The allowed amount of overlap is settable (0 - 100%).

Automatic section control works irrespective of the overlapping area being a headland or a triangle.

## Based on field boundary

The application uses field boundaries as imported from a Farm Management Information System (FMIS). Alternatively the application allows the user to record a field boundary during work. The application will automatically shut off the implement sections when crossing the field boundary. The allowed amount of overlap is settable (0 - 100%).

## Based on headland boundary

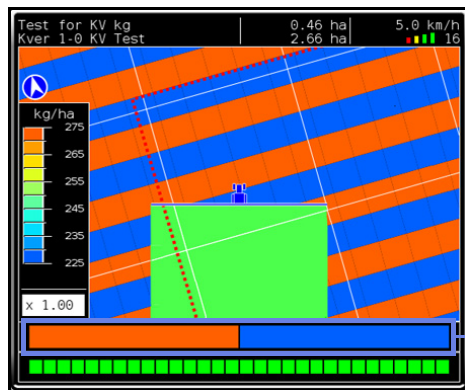


Once a field boundary is created or imported, a headland boundary can be created based on the field boundary. The width of the headland can be set by the user. The allowed amount of overlap is following the percentage used for section control based on overlap.

Be aware that...

- when standing still or reversing, all sections will be shut off.
- the recorded coverage and the field boundary are shown in the application main screen.
- automatic section control can at any time during work be disabled and enabled by the operator.
- automatic section control is available for one implement and one "boom", with a maximum of 88 sections.
- the coverage of already executed tasks will be stored internally. If an earlier task has not been finished, it can later be re-selected and work can continue based on the stored coverage.
- recorded field boundaries are stored and can later be used again for subsequent operations on the field.

# Variable rate application



## Variable rate

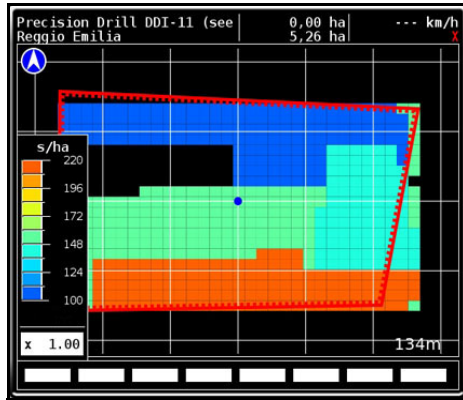
The variable rate application supports different application rates up to 24 sections within the working width for high accuracy and efficiency.

● Actual variable rate status

Be aware that

- Variable rate application is available for one implement and one "boom".
- Variable rate application can at any time during work be disabled and enabled by the operator.
- Application maps can be generated on a FMIS or by a crop consultancy company, using ISO-xml task-data.





## Based on an application map

The application map can be imported from a FMIS in ISO-xml format. The application determines the required application rate for the current boom position and automatically sets the required rate to the device.

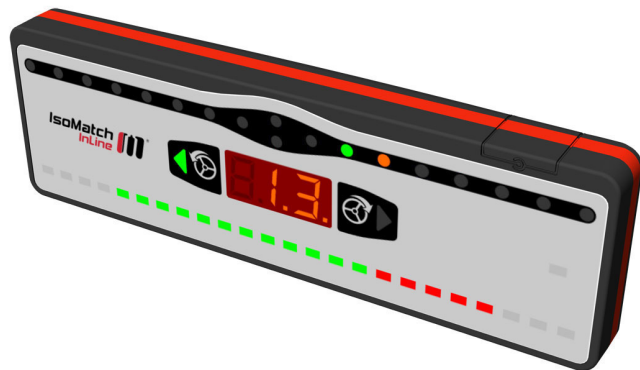
## Based on an external sensor (e.g. crop sensor)

When an external sensor is connected, the application will forward the received application rate from the external sensor to the connected implement.

## Multiplication factor

When applying a variable rate, either based on an application map or on an external sensor, there is a possibility to apply a multiplication factor. The set rate is multiplied with the number in the lower left corner of the GEOCONTROL screen (see the screenshot on the previous page), here this number can also be altered. The new rate is directly applied on the implement and for logging.

## Manual guidance

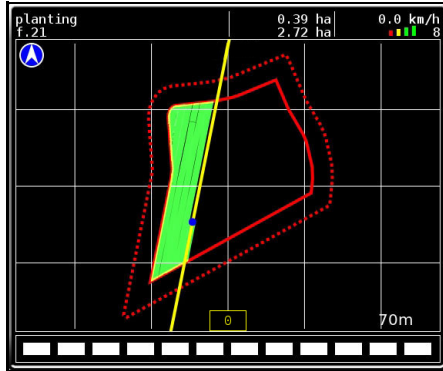


In combination with the IsoMatch InLine, the application provides manual guidance as a steering assist to navigate the tractor and implement across a specified path through the field.

The user can choose to record straight or curved lines while recording the line, which offers the possibility to record straight and curved segments on the same line.

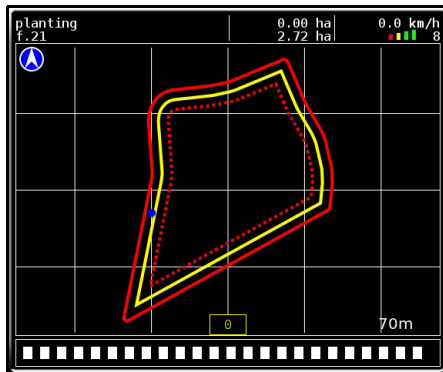
The guidance line is propagated to the left and the right with a user specified distance.

# Headland Control



The application allows for headland specific behaviour for section control and manual guidance. With the headland control feature, it is possible to

- work the field interior before working the headland. The application will shut off the sections based on the automatically generated headland line



- get guidance while working the headland, on a guidance line parallel to the field boundary.

The distance of the headland guidance line to the field boundary is settable.

The Headland Control toggle button in the main screen appears as soon as a field boundary is available. It allows for toggling between 3 states to

- work the entire field, use the recorded guidance line.

In this state, the application works regularly and will make no difference between main field or headland.



- work the headland, use the headland guidance line.







- work the main field only, use the recorded guidance lines.



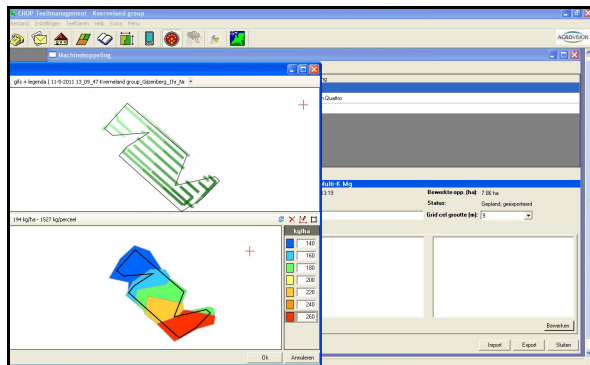
# Task management and documentation

## Registration of totals and as-applied data

	2.10 ha		0.00 hr
	0.11 hr		0.01 km
	0.42 ton		
	0.87 km		

During work, the application will automatically record task totals as received from the implement. For every new task that is started, the application records a new set of totals. By the same means, as-applied data will be recorded from the implement. The choice of recorded data depends on the availability in the implement.

## Data exchange with Farm Management Information Systems (FMIS)



The application can import a set of task data from an FMIS. The imported task data may consist of

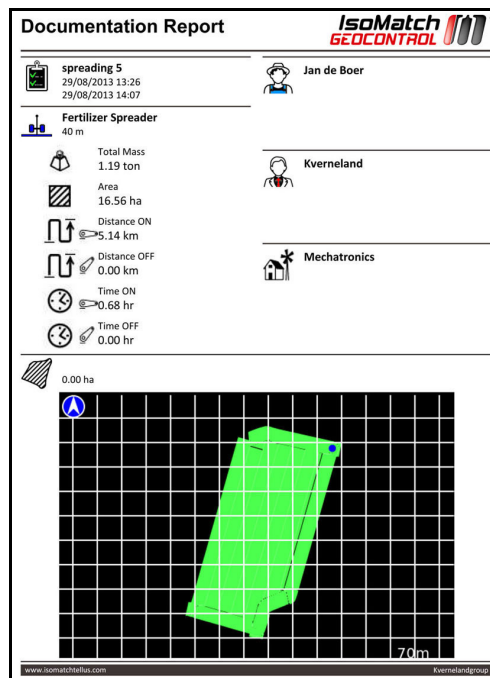
- lists of customers, farms, fields, workers and products,
- planned tasks,
- variable rate application maps,
- field boundaries,
- guidance lines.

In the application, the planned tasks can be selected for execution. Alternatively, new tasks can be generated based on the available lists of customers, farms, fields and products.

After the tasks are finished, these can be exported to a USB-stick. The exported data will consist of all task related data including totals, as-applied data, used devices and start and end time.

The exported data can be imported again in a FMIS for administration purposes.

Exporting taskdata will be done in parallel with exporting task reports in html (see below).



## Creating of task reports in html

The application allows for exporting of finished tasks as html reports. The report will consist of a coverage map of the task, task totals and task information as customer, farm and field, and start and end time.

## Managing the data

The application allows for editing, adding and deleting data. Unused entities as for example retired fields can be deleted from the system. The operator can also add meta-data, as for example contact details of customers.

**Note!** It is possible to import and export taskdata remotely when the FarmCentre license is activated!

## **IsoMatch GEOCONTROL for non-ISOBUS implements**

When working with a non-ISOBUS implement, there is the possibility of configuring the Tractor ECU as a virtual implement, matching the actual implement that you are working with. This can be used to create a coverage map while not using an ISOBUS implement. In order to use this functionality, make sure that:

- Tractor ECU is activated
- Tractor ECU task controller is active
- Tractor ECU implement settings are set to match the actual implement
- No other ISOBUS implements are connected to the system

For further information refer to the Tractor ECU manual.

### **Variable rate application**

When the implement you are working with uses an external rate signal, or you are working with an application map, it is also possible to use this rate for logging. As soon as a task is started and the supplied rate is shown in the lower left corner of the GEOCONTROL screen, this rate is logged for later export.

# Compatibility

## Compatible devices

For the above mentioned functionality, the application uses the ISO11783-10 Task Controller protocol to communicate to connected implements. Not all ISOBUS implements support task control.

## Compatible data exchange to FMIS

Task planning, variable rate application maps and data export is done using the ISO11783-10 ISO-xml Taskdata format.

## Compatible GNSS (Global Navigation Satellite System) antennas

The application can obtain GNSS positioning signal from most commercially available GNSS antennas through the NMEA0183 serial protocol.

## Compatible external rate sensors

The application can obtain an setpoint application rate from an external source, e.g. a crop sensor or a PDA through a serial protocol.



## IsoMatch GEOCONTROL Licenses

IsoMatch GEOCONTROL is a licensed application in the IsoMatch Tellus terminals. The terminal is delivered with a 25 hr demo-license, which will count down while using the licensed features of the application. After the 25 hr has expired, the application's functionality will be limited. The user must obtain and enter a valid license keys to enable functionalities. The required license keys depend on the terminal type.

### IsoMatch GEOCONTROL Limited

When no valid IsoMatch GEOCONTROL license key is entered, the functionality of IsoMatch GEOCONTROL is limited to:

- Registration of totals
- Variable rate application based on external sensor
- Manual guidance
- Coverage logging

### IsoMatch Tellus PRO

On IsoMatch Tellus PRO full GEOCONTROL functionality is unlocked by entering the IsoMatch GEOCONTROL license. Please refer to the  IsoMatch Tellus PRO user manual for instructions.

## **IsoMatch Tellus GO**

The IsoMatch Tellus GO has two levels of licenses.

### **● IsoMatch GEO-SC**

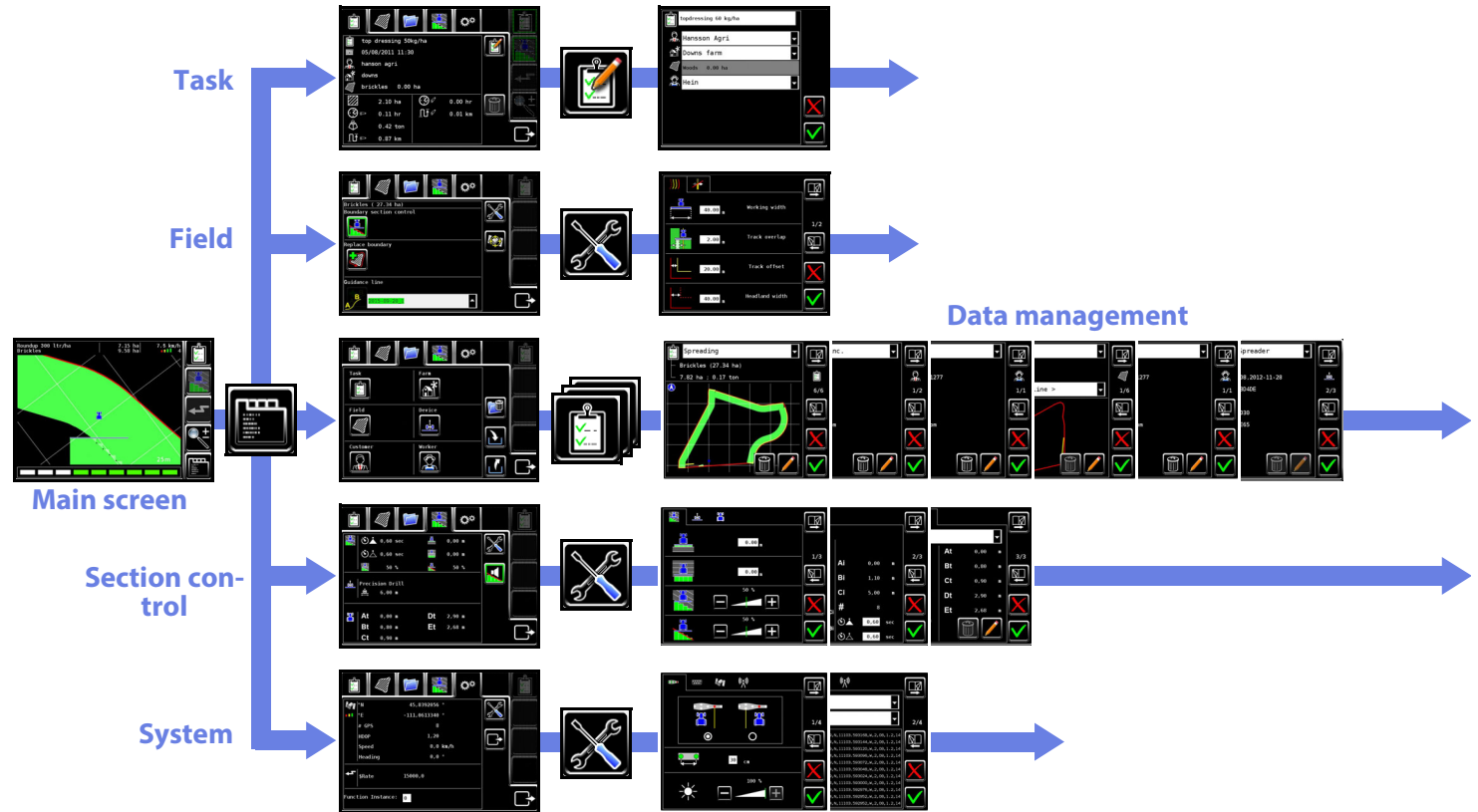
This license will enable Section control functionality, this functionality is used to shut down the sections of your device outside of the field boundary or in case of overlap.

### **● IsoMatch GEO-VR**

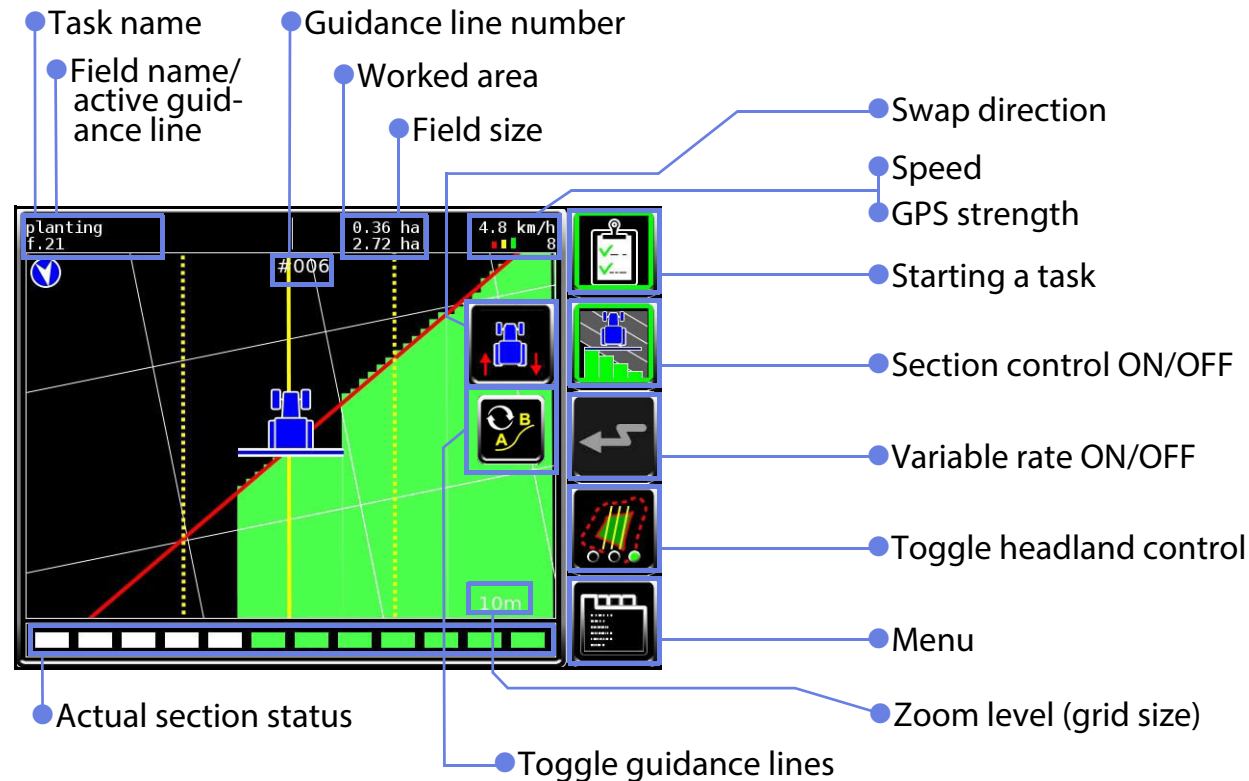
This license will enable variable rate functionality through application maps, this is required to apply a product based on application maps, which can be made by specialised companies or farm management information systems.

Please refer to  IsoMatch Tellus GO user manual for instructions on entering licenses.

# Overview of the screens



# Main screen



## Menu screens

► To go to the menu, press the **Menu** button. The menu will appear, offering 6 tabs. These are explained in the following paragraphs.

The screenshot shows a menu screen with a top bar containing six tabs: Task tab (clipboard icon), Field tab (field icon), Data (folder icon), Section control (field with building icon), System tab (gears icon), and an unlabeled tab (map icon). The main area is divided into a left panel with a list of items and a right panel with a grid of icons. A blue box highlights the 'Back to the main screen' button (a square with a right-pointing arrow) in the bottom right corner of the right panel.

Labels pointing to the tabs:

- Task tab
- Field tab
- Data
- Section control
- System tab

Labels pointing to the main area:

- Back to the main screen

Content of the left panel:

- top dressing 50kg/ha
- 05/08/2011 11:30
- hanson agri
- downs
- brickles 0.00 ha
- 2.10 ha
- 0.11 hr
- 0.42 ton
- 0.87 km
- 0.00 hr
- 0.01 km



## Task tab

The screenshot shows the 'Task tab' interface. At the top is a toolbar with icons for a clipboard, a field, a folder, a task, a gear, and a map. Below the toolbar is a list of tasks. The first task is 'top dressing 50kg/ha'. To its right is an 'Edit' button (clipboard with pencil icon). Below the task name are fields for '05/08/2011 11:30', 'hanson agri', 'downs', and 'brickles 0.00 ha'. Below these are fields for '2.10 ha', '0.11 hr', '0.42 ton', and '0.87 km'. To the right of these fields are fields for '0.00 hr' and '0.01 km'. At the bottom right is a 'Clear task' button (trash can icon). To the right of the interface are callouts pointing to various elements:

- Task name
- Edit
- Local date and time
- Customer
- Farm
- Field area
- Clear task
- Field record totals

► To edit task information, press the **Edit** button.

**Info!** The editing is available for locally created tasks only!

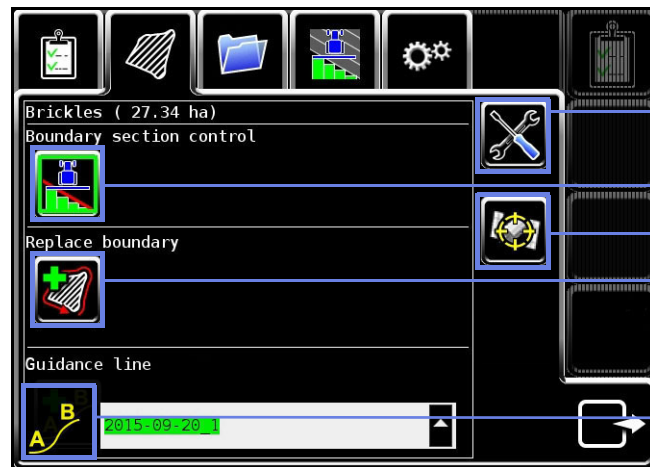


The edit task screen submits to edit task data settings.

The screenshot shows a mobile application interface for editing task data. It features a list of input fields, each with a small icon to its left: a clipboard for the task name, a person for the customer's name, a house for the farm name, a field for the field name, and a person for the worker's name. The 'Field' entry is highlighted in grey. At the bottom right, there are two buttons: a red 'X' for cancellation and a green checkmark for confirmation. Blue lines connect the labels on the right to the corresponding input fields.

Field	Value
Task name	topdressing 60 kg/ha
Customer's name	Hansson Agri
Farm name	Downs farm
Field (here not editable)	Woods 0.00 ha
Worker's name	Hein

## Field tab



● Field settings button

● Boundary section control ON/OFF

● Calibrate GNSS button

● Create/replace boundary

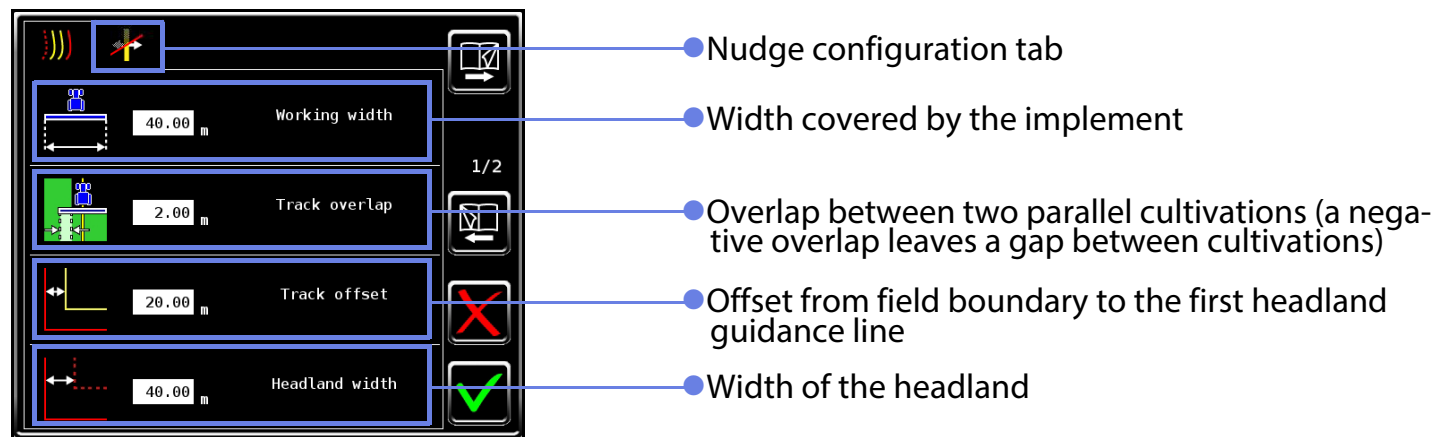
● Create/select/edit guidance line

► To edit the field settings, press the **Field settings** button.



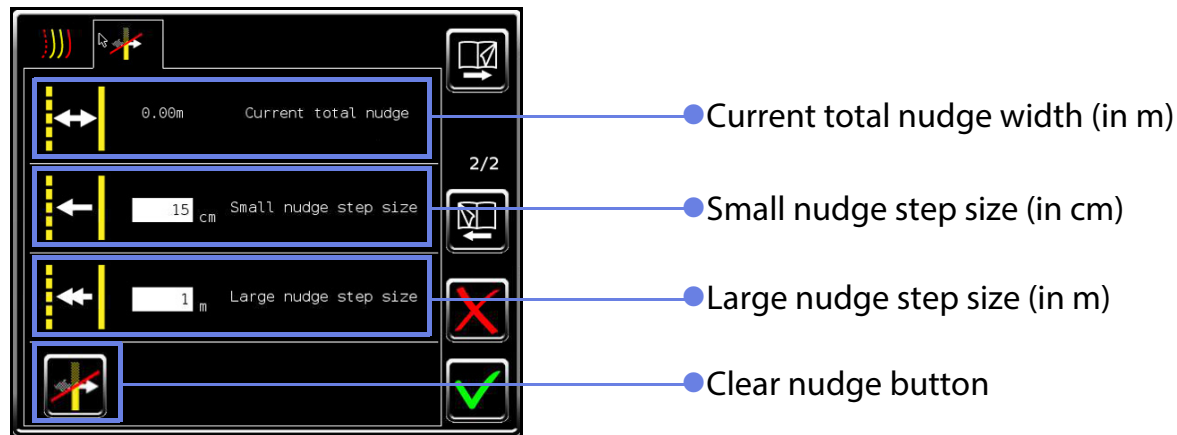


## Field settings screen



**Important!** If the working width is changed manually, the changed value will be overwritten with the working width supplied by the implement upon restart or when the implement geometry is changed.

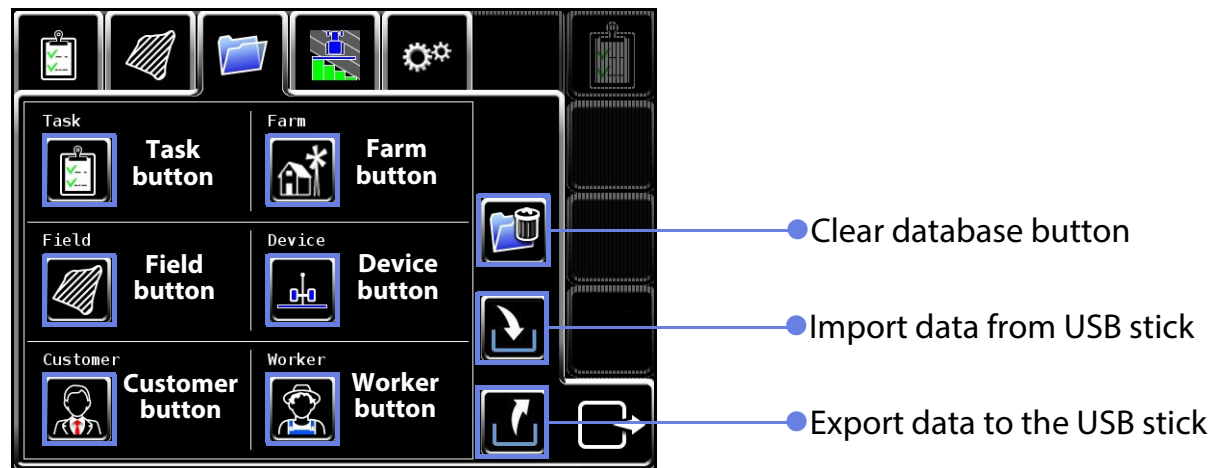
## Nudge settings screen



**Note!** The nudge orientation of the current total nudge, the small nudge step size and the large nudge step size to the left or to the right, is depending on the selection in the **Nudge menu**.

Refer to [Nudging](#)

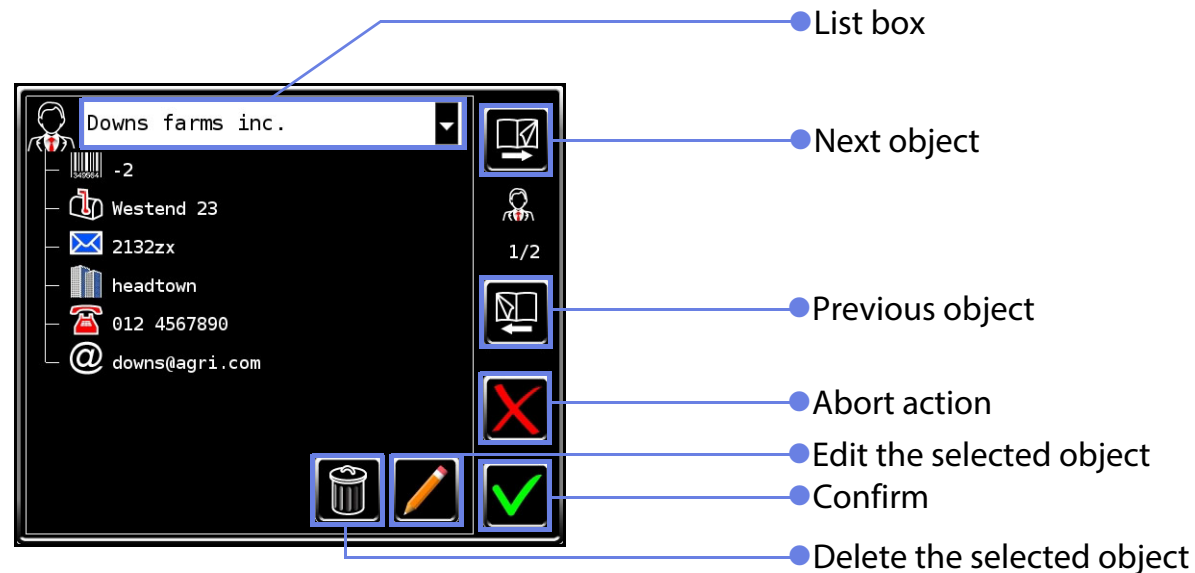
## Data management tab



**Info!** The editing is available for locally created tasks only!

**Info!** Editing is only allowed if no task is running!

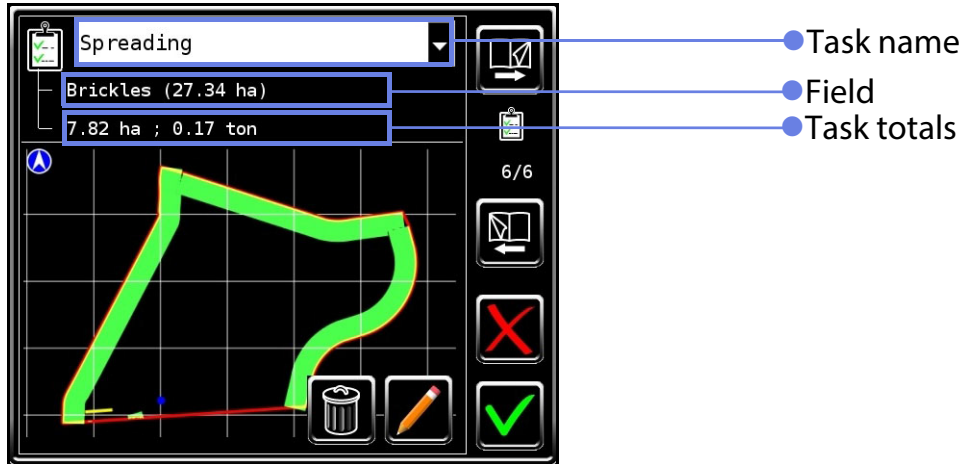
► To edit data, press the corresponding **Edit** button.  
This screen offers adding and editing data.



► Press **<new>** in the list box to add a new object.

## Task page

This page provides task information.

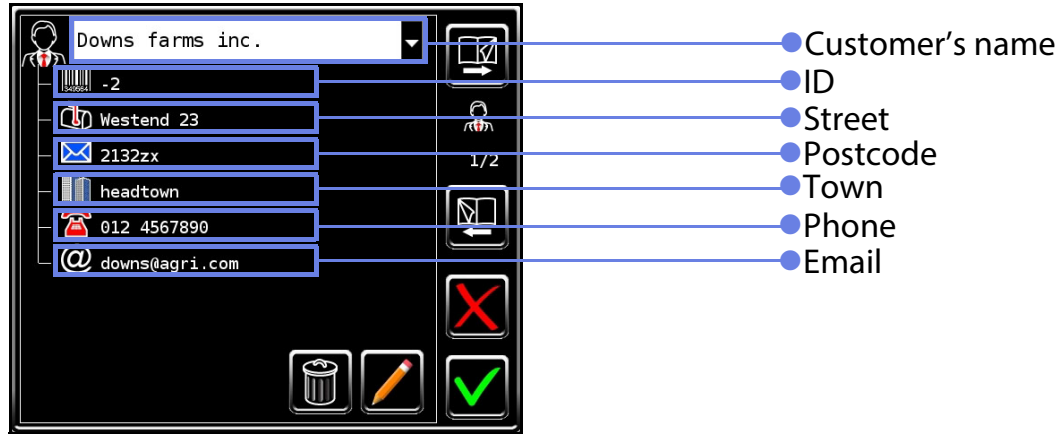


The screenshot shows a software interface for task management. At the top, there is a dropdown menu labeled 'Spreading'. Below it, two text boxes display 'Brickles (27.34 ha)' and '7.82 ha ; 0.17 ton'. A map area shows a green field boundary on a grid. To the right of the map is a vertical toolbar with icons for a clipboard, a field map, a trash can, a pencil, and a checkmark. Three blue lines with circular endpoints point from the text labels on the right to the corresponding elements in the interface: 'Task name' points to the 'Spreading' dropdown, 'Field' points to the 'Brickles (27.34 ha)' text box, and 'Task totals' points to the '7.82 ha ; 0.17 ton' text box.

- Task name
- Field
- Task totals

## Customer page

This page provides customer information.



## Farm page

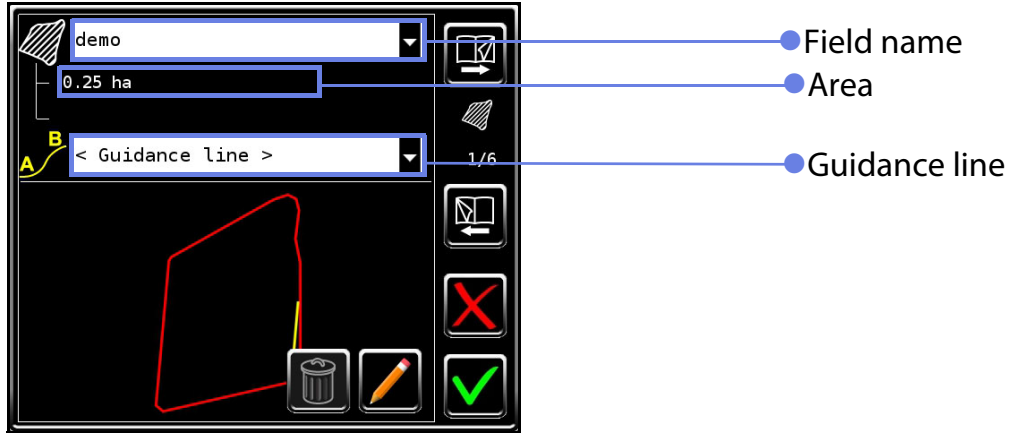
This page provides farm information.

The screenshot shows a mobile application interface for a 'Farm page'. The page has a dark background with white text and icons. At the top, there is a home icon and a dropdown menu showing 'Hansson Agri'. Below this, there are six input fields, each with a specific icon: a barcode for ID, a house for Street, an envelope for Postcode, a building for Town, and a person for Customer. To the right of these fields, there are three icons: a checkmark in a box, a red 'X' in a box, and a green checkmark in a box. At the bottom, there are three icons: a trash can, a pencil, and a green checkmark in a box. Blue lines connect the labels on the right to the corresponding input fields on the left.

- Farm name
- ID
- Street
- Postcode
- Town
- Customer

## Field page

This page provides field information.





## Worker page

This page provides worker information.

The screenshot shows a worker information form for a worker named 'Hein'. The form includes fields for ID, Street, Postcode, Town, Phone, and Email. Each field is highlighted with a blue box and a corresponding label to its right. The labels are: 'Worker's name' (pointing to the name field), 'ID' (pointing to the ID field), 'Street' (pointing to the street field), 'Postcode' (pointing to the postcode field), 'Town' (pointing to the town field), 'Phone' (pointing to the phone field), and 'Email' (pointing to the email field). The form also features a trash icon, an edit icon, and a save icon at the bottom.

Field	Value
Worker's name	Hein
ID	-1
Street	Canal West 1277
Postcode	2132 xx
Town	Headtown
Phone	098 7654321
Email	Hein@agri.com

## Implement page

This page provides implement information.

Fertilizer Spreader

-2 (0)

EDW2\_ISO, 0.08, 2012-11-28

A00A80000B3BD4DE

2D383131303030

FF000000006E65

2/3

Implement

## Section control tab

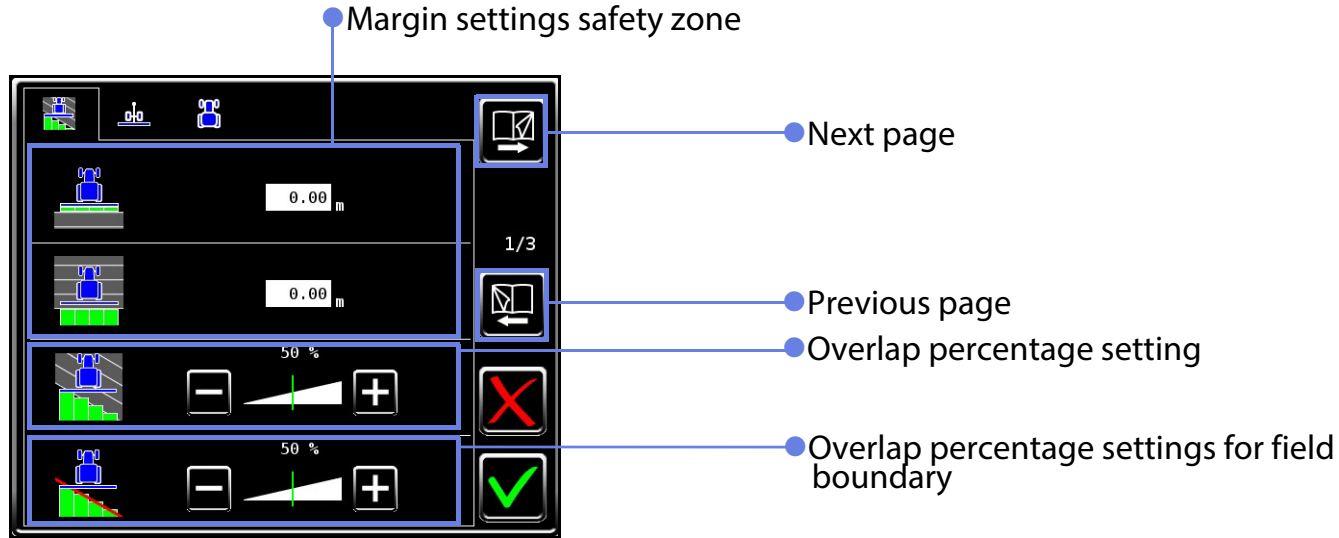


- Section control settings button
- Overlap settings
- Beep when machine or sections turn on or off
- Implement settings
- Tractor settings

► To edit the section control settings, press the **Section control settings** button.



## Overlap settings screen



**Info!** For instruction on how to do the settings, refer to [Section control settings](#).

## Implement settings screen

The screenshot shows the 'Precision Drill' implement settings screen. It features a top view diagram of the implement on the left, a list of section parameters in the center, and control buttons on the right. Callouts point to the following elements:

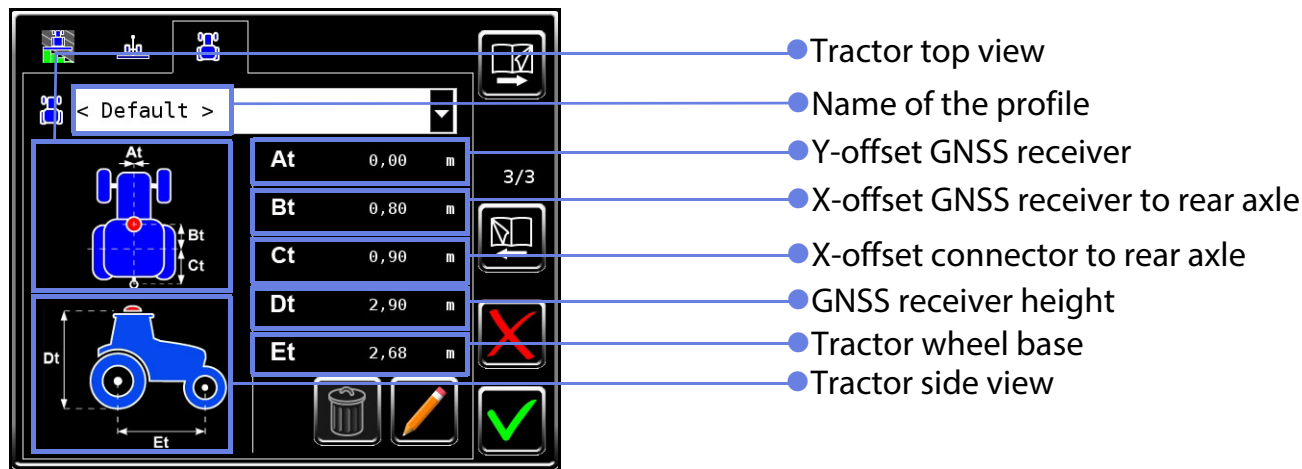
- Choose connection type
- Y-offset
- X-offset connection point to section (hitched implement)
- X-offset implement axle to section (trailed implement)
- X-offset connection point to implement axle (only trailed implement)
- Number of sections
- Delay time switch ON
- Delay time switch OFF
- Implement top view

Parameter	Value	Unit
Ai	0,00	m
Bi	1,10	m
Ci	5,00	m
#	8	
Delay time (ON)	0,60	sec
Delay time (OFF)	0,60	sec

If the data cannot be edited here, refer to the [↻](#) implement configuration screens.

**Info!** In case of multiple axles on the implement, use the front axle as reference.

## Tractor settings screen



The screenshot shows the 'Tractor settings screen' with various controls and a list of parameters. Callouts point to the following elements:

- Tractor top view (points to the top view icon in the top right)
- Name of the profile (points to the '< Default >' dropdown menu)
- Y-offset GNSS receiver (points to the 'At' parameter: 0,00 m)
- X-offset GNSS receiver to rear axle (points to the 'Bt' parameter: 0,80 m)
- X-offset connector to rear axle (points to the 'Ct' parameter: 0,90 m)
- GNSS receiver height (points to the 'Dt' parameter: 2,90 m)
- Tractor wheel base (points to the 'Et' parameter: 2,68 m)
- Tractor side view (points to the side view icon in the bottom right)

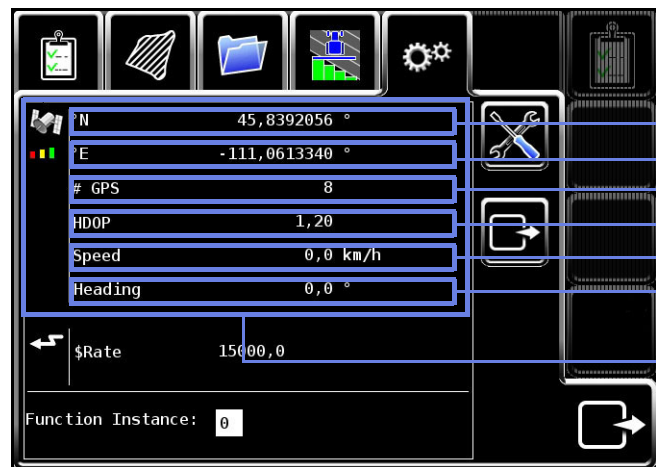
At	0,00	m
Bt	0,80	m
Ct	0,90	m
Dt	2,90	m
Et	2,68	m

In addition to the **<Default>** profile, you can create your own different tractor profiles in order to store different tractor settings. You can create a new profile by selecting option **<New>**. All profiles can be edited and deleted with an exception that, the **<Default>** profile can be edited but cannot be deleted.

► Press the **Confirm** button to apply the settings of the selected profile.



## System tab



The screenshot shows the 'System tab' interface. At the top is a toolbar with icons for a clipboard, a map, a folder, a 3D bar chart, and a gear (Settings). The main area displays a table of system data. A blue box highlights the first seven rows of this table. To the right of the table, a vertical column of icons includes a wrench and screwdriver, a square with a right-pointing arrow, and another square with a right-pointing arrow. Blue lines connect these icons to a list of labels on the right. Below the table, there is a section for '\$Rate' and 'Function Instance: 0'.

N	45,8392056 °
E	-111,0613340 °
# GPS	8
HDOP	1,20
Speed	0,0 km/h
Heading	0,0 °
\$Rate	15000,0

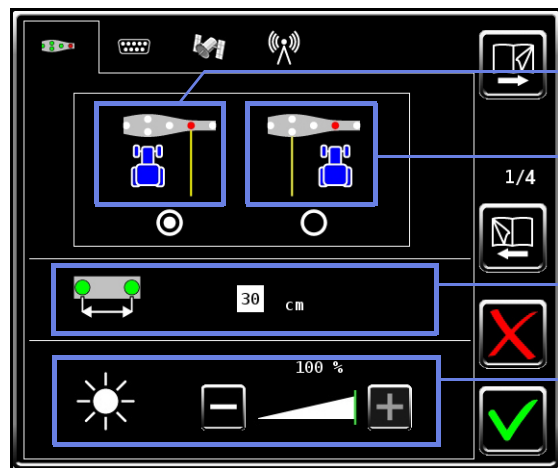
- Latitude
- Longitude
- Number of satellites
- Accuracy
- Speed on ground
- Direction
- GNSS status

Function Instance: 0

► To edit system settings, press the **Settings** button.



## IsoMatch InLine settings screen



Guidance mode:

• Steer away from the LED indication

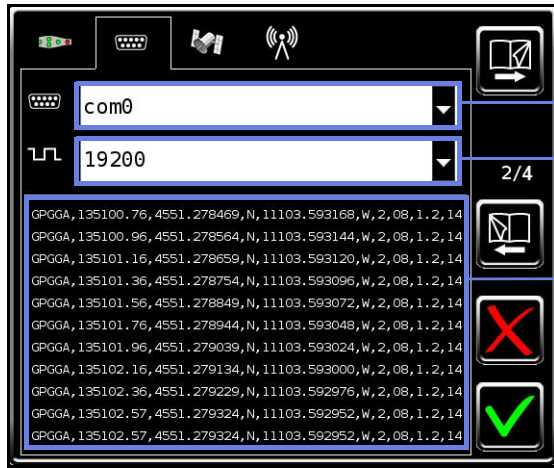
• Steer towards the LED indication

• Indication of offset from the line per LED

• Brightness of IsoMatch Inline



## Serial port settings screen

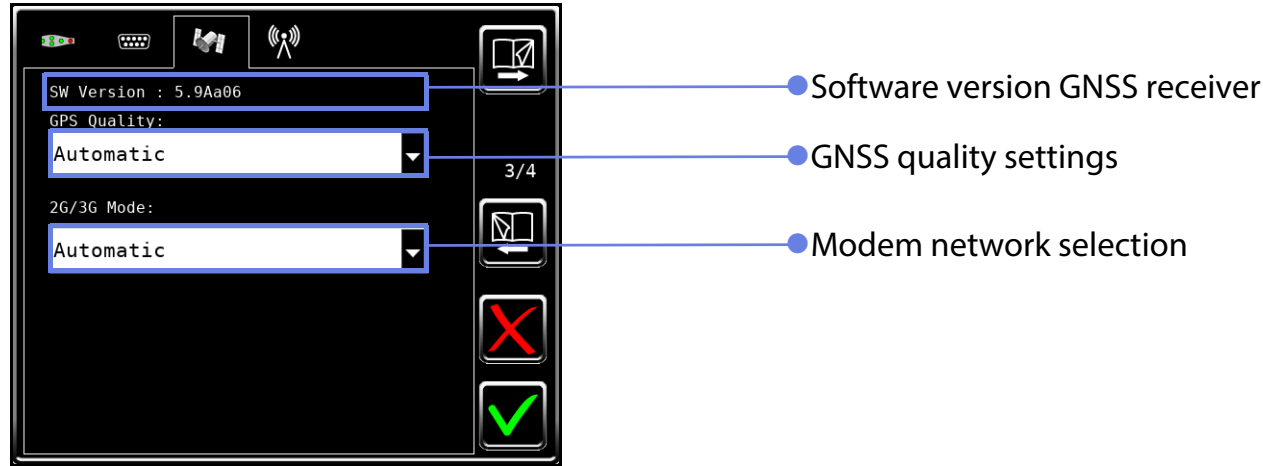


Com port

Baudrate

Serial port raw data

## GNSS receiver configuration settings screen



In this tab, the GNSS receiver can be configured and the GNSS quality can be set.

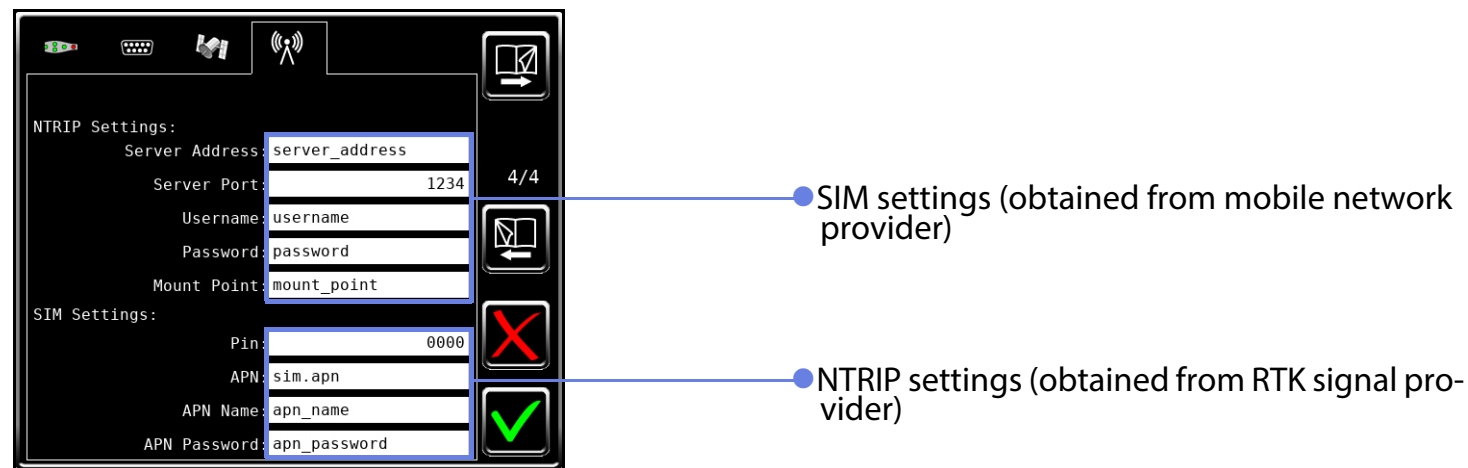
- **Automatic** mode will ensure the highest available quality at all times.
- **RTK** mode will only allow IsoMatch AutoDrive to be engaged if RTK fix quality is available.
- **DGPS** mode will disable the RTK modem to preserve mobile data usage, but this will have a considerable negative influence on positioning accuracy

More over the network selection for the modem can be configured.

This is only possible when the modem is connected.

- **Automatic** mode will ensure the highest available quality at all times.
- **2G mode** will fix the network to 2G.
- **3G mode** will fix the network to 3G.

## RTK modem configuration settings screen



When the IsoMatch Global PRO GNSS receiver is connected to the terminal via the serial cable and an RTK modem is connected to the receiver, the RTK modem configuration tab is shown in the system tab's settings menu.

In this tab, the SIM and NTRIP settings the modem uses to obtain RTK correction data can be configured. SIM and NTRIP settings are provided by your mobile network provider and RTK provider, respectively.

The SIM/NTRIP settings consist of the following:

NTRIP settings (RTK correction data, to be provided by your RTK provider)

- **Server address** The internet address of the NTRIP server.
- **Server port** The port through which the NTRIP server will be accessed.
- **Username** The username for the NTRIP server.
- **Password** The password for the NTRIP server.
- **Mount point** The name of the correction data stream from the NTRIP server

SIM settings (Mobile data connection, to be provided by your mobile network provider)

- **PIN** The SIM card's unlock code; if the SIM card is not locked, this field can have any value.
- **APN** The internet address of the mobile data provider's access point.
- **APN name** The username for the mobile data access point.
- **APN password** The password for the mobile data access point.

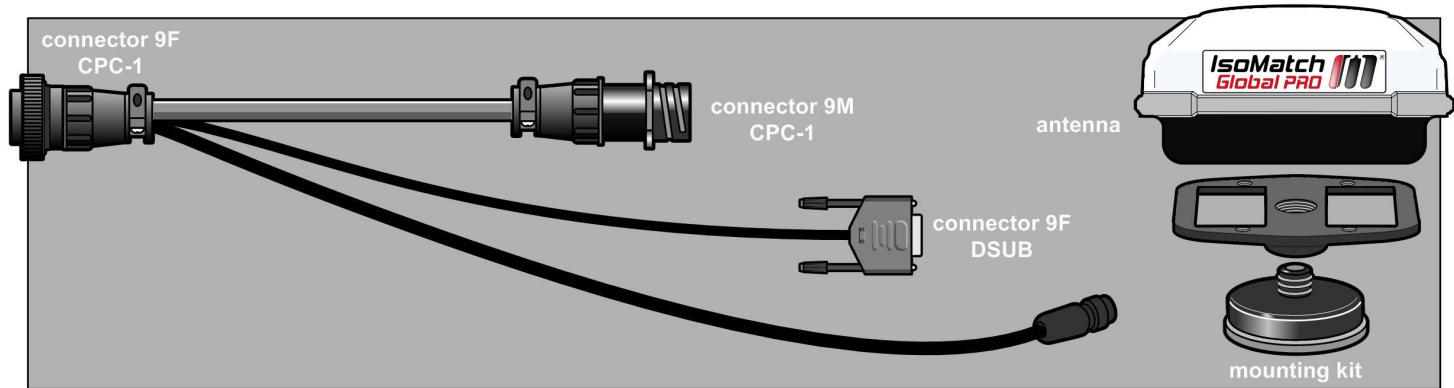
# Preparing for operation

## License key GEOCONTROL

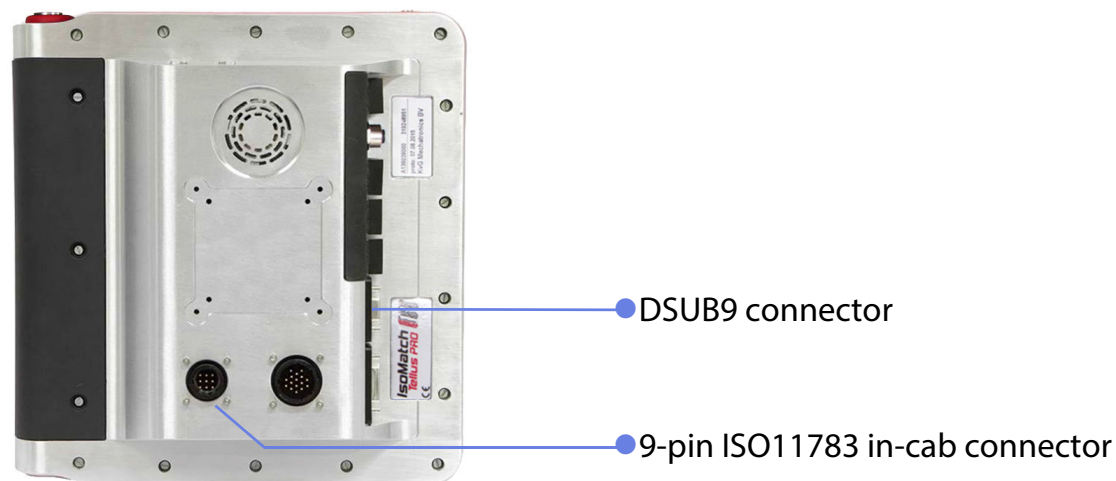
After the 25 hours demo license are spent, obtain a license key for GEOCONTROL. Please refer to the [IsoMatch Tellus/IsoMatch Tellus PRO user manual](#) for instructions.

## Connect GNSS antenna or external rate source

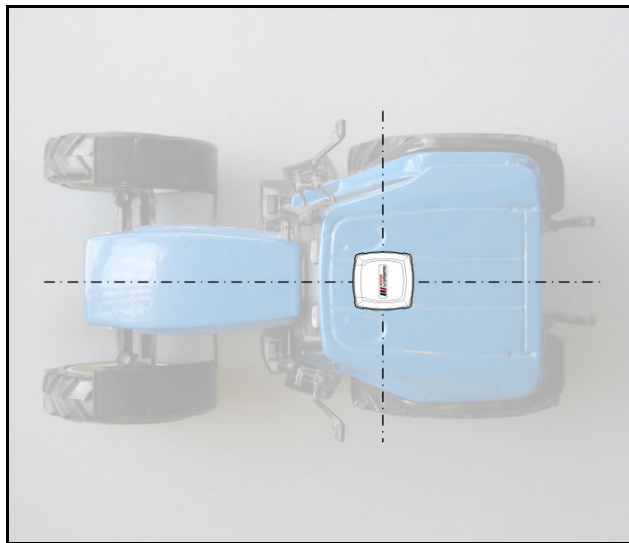
### IsoMatch Global/Global PRO antenna



The IsoMatch Global antenna can be connected to the IsoMatch Tellus.



- ▶ Connect the 9-pin in-cab connector of the IsoMatch Global antenna to the back of the IsoMatch Tellus for power supply.
- ▶ Connect the DSUB9 connector of the IsoMatch Global antenna to the DSUB9 connector for GNSS-messages on the side of the IsoMatch Tellus.



The recommended position for installing the IsoMatch Global antenna is centred in long axis on top of the tractor cabin roof, as much as possible to the front.



### 3rd party GNSS antenna

When using a 3rd party GNSS antenna, connect this to the IsoMatch Tellus serial DSUB9 port.

Serial port specification	
Pin assignment	
●2	●Rx
●3	●Tx
●5	●Signal ground
●other	●Not used
Communication	
●protocol	●NMEA0183-\$GPGGA message
●baudrate (kbps)	●4800, 9600, 19200, 38400, 59600, 115200
●update rate	●5 or 10 Hz

## External rate source

When using an external rate source, connect this to the IsoMatch Tellus serial DSUB9 port.

Serial port specification	
Pin assignment	
● 2	● Rx
● 3	● Tx
● 5	● Signal ground
● other	● Not used
Communication	
● protocol	● Kverneland Group \$RATE message
● baudrate (kbps)	● 4800, 9600, 19200, 38400, 59600, 115200
● update rate	● 1 Hz (preferred)




## Serial port settings

In ➔ Menu ➔ System tab ➔ [Serial port settings screen](#), set the baudrate according to the source. You can verify if the data is correctly received by checking if the raw data is received.

## USB-serial port settings

To connect an external rate source in parallel with a GNSS antenna, use the optional USB-serial adapter cable to allow for a second serial input on the terminal.

The serial port specifications are identical to that of the IsoMatch Tellus serial DSUB9 port.

In  Menu  System tab  [Serial port settings screen](#), set the baudrate according to the source. You can verify if the data is correctly received by checking if the raw data is received.

## Implement configuration settings

▶ Connect the implement to the ISOBUS system.

For the implement it is required to:

- ▶ enable task control support
- ▶ set the right geometrical configuration
  - offsets
  - number of sections
  - delay time switch ON/delay time switch OFF
  - section's widths

**Important!** The time latency has been replaced with separate **delay time switch ON** and **delay time switch OFF** values, if these cannot be changed in the implement configuration screen, edit these in the section control settings.


In ➡ Menu ➡ [Section control tab](#), the implement geometry configuration can be reviewed.

**Info!** If the data cannot be edited here, do this in the implement configuration settings.


**Info!** If the changes don't take effect immediately, restart the terminal (or reconnect the implement).


## Implement setup screen for Kverneland and Vicon implements


TC Config & License

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 08194 02497 01964 27148  
www.isomatchshop.com


 

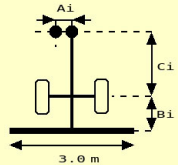
 

- Enable task control support
- Enable totals reporting
- Enable rate commands
- Enable section control commands







Ai  m



Bi  m

Ci  m

  s

  s

- Choose connection type
- Y-offset. Positive values indicate offset to the right.
- X-offset for trailed implement: implement axle-application point.
- X-offset for hitched implement: connection point-application point.
- X-offset only for trailed implement: connection point- implement axle.
- Delay time switch ON
- Delay time switch OFF

► Refer to [Section control settings](#), to adjust the settings to your personal demands.

## Tractor offsets

In ➞ Menu ➞ [Section control tab](#), set the tractor geometrical offsets.

- Antenna offset
- Hitch offset

## Section control settings

▶ In ➞ Menu ➞ [Section control tab](#), set the overlap settings

- Margin on
- Margin off
- Overlap percentage
- Boundary percentage

▶ Refer to [Section control settings](#), to adjust the settings to your personal demands.

## IsoMatch Inline lightbar settings

► In ➞ Menu ➞ [IsoMatch InLine settings screen](#), adjust the settings for the optional IsoMatch InLine lightbar.

- Lightbar mode:
  - Steer towards the LED indication
  - Steer away from the LED indication
- Indication of offset from the line per LED
- Brightness of the IsoMatch InLine

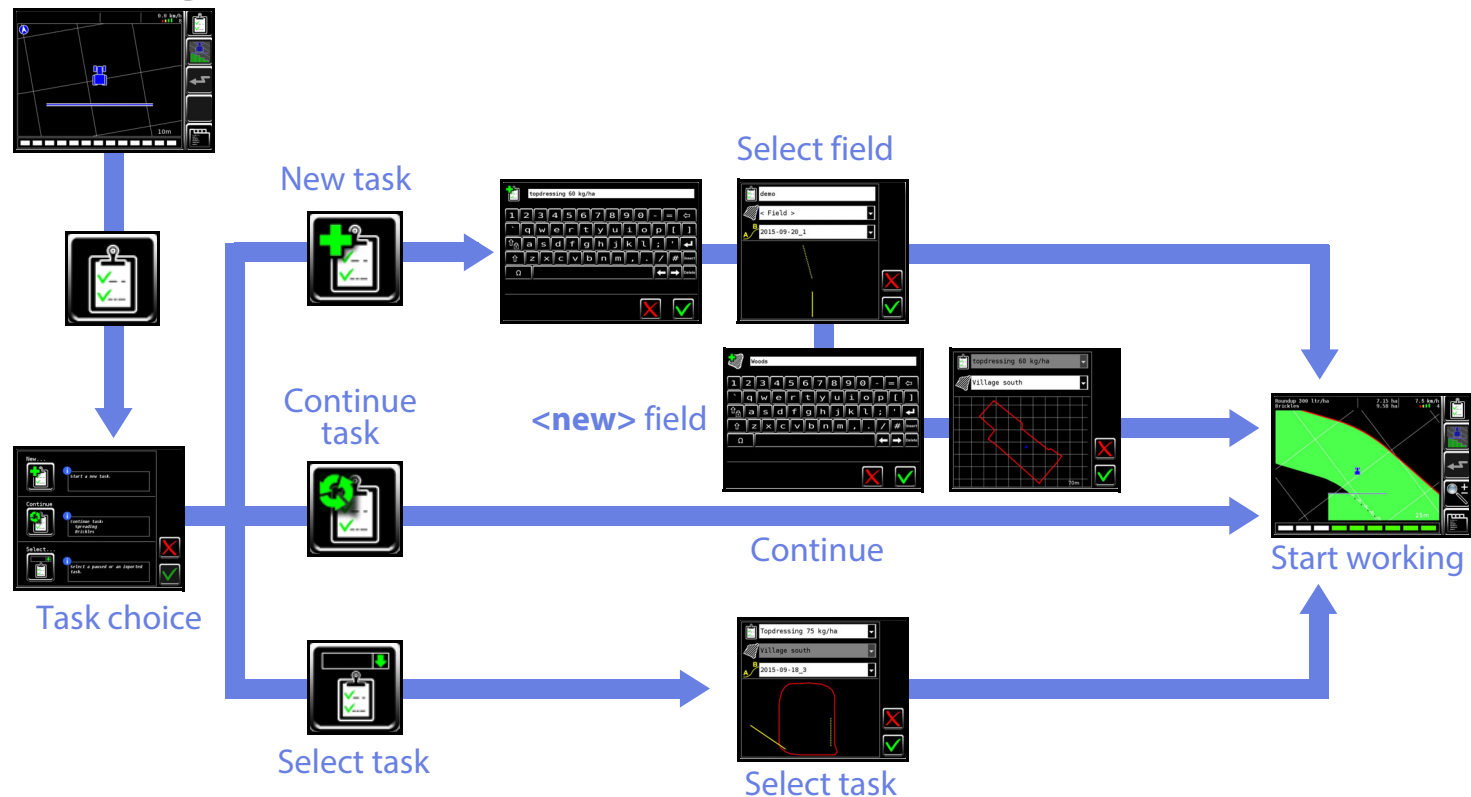
## Headland and guidance settings

► In ➞ Menu ➞ Field tab ➞ [Field settings screen](#), set the headland and guidance offsets.

- Width of headland
- Distance between guidance lines
- Offset from field boundary to the first headland guidance line

By default these values will be adapted to the connected machine, but these can at any time be adjusted to your preferences. The adjusted values will be stored per machine.

# Starting a task

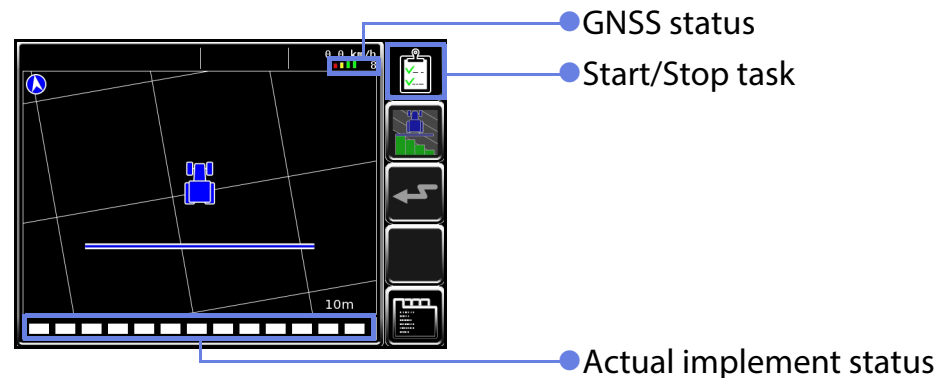




**Important!** Before starting a task, reassure that

- the GNSS (→ GNSS status) and
- the implement (→ Actual implement status) is connected.

Do not start on the farm or on the road yet, but wait until you are in the field.

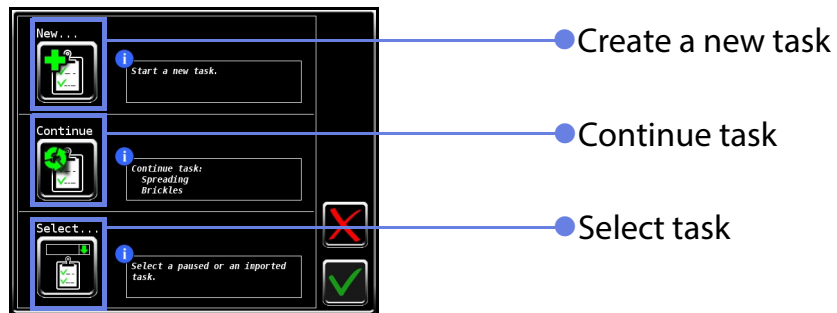


To start working with the application, you need to start a task. Proceed as follows:

- ▶ Press the **Start Task** button.



A popup window appears offering 3 choices



Starting a task

## Create a new task

Select this option to start a new task. The task will start with a cleared coverage and totals. Upon creating of a new task, a field can be selected or created.

▶ Press the **New task button**..



● Task name

● Confirm action

● Abort action

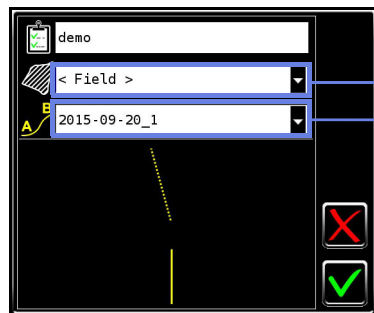


▶ Enter a task name. For example "top dressing", or "herbicide".

▶ Confirm.



► Optionally select a field from the list, or create a new field



● Field name

● Guidance line

► After selecting a field, optionally select a different guidance line from the list, or record a new guidance line.

► When selecting **<new>**, a screen will appear for entering a field name.



● New field name

► Enter a new field name and confirm.



After creating a new field, you can choose to record a boundary and a guidance line for this field.

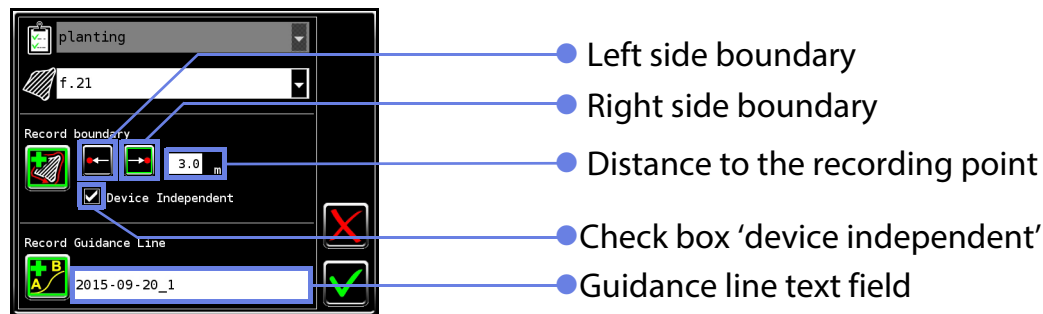


● Create boundary button

● Create guidance line button

► Select to create a boundary for this field.





If a device is connected, you can allow recording dependent of the device. In this case the boundary will be recorded while the device is in work.

- ▶ Uncheck the 'device independent'.
- ▶ Select if the boundary is at the right or left side of the boom.

To record a boundary independent of the device,

- ▶ check the 'device independent'.
- ▶ Enter the distance from the tractor to the recording point.
- ▶ Select if the boundary is at the right or left side of the tractor.

If no device is connected,

- ▶ Enter the distance from the tractor to the recording point.
- ▶ Select if the boundary is at the right or left side of the tractor.

The recording of boundary will commence during working.

**Info!** For more information about boundary recording, refer to [↪ Creating a field boundary](#).

- ▶ Select to create a guidance line for this field.
- ▶ When you create the first guidance line you press the shown button.



- ▶ A suggested name for the new guidance line is displayed here. Click on this text field to edit.

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**Info!** For more information about creating a guidance line, refer to [↪ Headland Control](#).

- ▶ Confirm to start working.



## Continue task

- ▶ Select this choice to continue the previously executed task. The coverage and totals of that task will be reloaded.

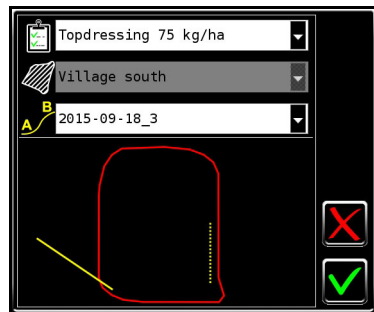
The task will start immediately after this button is pressed.



## Select task

- ▶ Select this choice to select a task from the list.

The list of tasks will consist of all previously created tasks and/or planned tasks that are imported as taskdata from a FMIS. The list of tasks can not be edited, i.e. it is not possible to change the field that is selected for that task.



- ▶ When more than one guidance lines are recorded in a field, select the guidance line you want to use.



- ▶ Confirm to start working.



# During working

During work, the following functions are active....

- Automatic section control
- Variable rate application
- Documentation of totals
- Documentation of as applied data
- Manual guidance

## Section control ON/OFF

As soon as a GNSS signal is available and the implement has section control capabilities, automatic section control will by default be enabled. At any time during work, the operator can deactivate automatic section control.

▶ Press the automatic section control toggle button to deactivate or activate.

The status of automatic section control is indicated by the button's border colour.

- No color indicates automatic section control is OFF.
- Green color indicates automatic section control is ON.




- Yellow color indicates that the implement did not accept section control commands.
- ▶ Check the device configuration.



- Red color indicates that there is no license to do section control.
- ▶ Please refer to [IsoMatch GEOCONTROL Licenses](#)



 The operator is responsible for the correct functioning of automatic section control. At all times, assure yourself of the correct functioning of the system. Possible error causes may be incorrect section control settings, or error in the GNSS positioning signal.

If the automatic section control result is not as intended, refer to the chapter [Section control settings](#) to change.

As soon as GNSS signal is lost, automatic section control will toggle off. After GNSS returns, the automatic section control toggle must be enabled again by the operator.

### **Boundary section control ON/OFF**

Alternatively it is possible to de-activate boundary based section control only.

In [Menu](#) [Field tab](#), ▶ press the field boundary toggle.

When toggled off, the boundary will appear grey in the map.



## Rate control ON/OFF

As soon as a task starts and the task includes a prescribed application rate and the implement has variable rate application capabilities, variable rate application will by default be enabled. At any time during work, the operator can deactivate variable rate application.

▶ Press the variable rate application toggle button to deactivate or activate.

The status of variable rate application is indicated by the button's border colour.

● No color indicates variable rate application is OFF.



● Green color indicates variable rate application is ON.



● Yellow color indicates that the connected device does not support variable rate application.

▶ Refer to the connected  device manual.



● Red color indicates that there is no license for variable rate application.

▶ Please refer to [IsoMatch GEOCONTROL Licenses](#)



When working with an application rate map, GNSS is required to vary the rate based on position. If GNSS signal is lost, a default rate (as defined in the FMIS) will be sent.



The operator is responsible for the correct functioning of variable rate application. At all times, assure yourself of the correct functioning of the system. Possible error causes may be an incorrectly created variable rate application map, or error in the GNSS positioning signal.

## Zoom level

▶ Tap on the map to zoom the map.

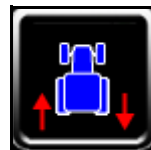
Zoom levels are 10, 25, 50 meter and a field view centred on the field

## Driving direction

The application calculates based on GNSS position if the tractor is driving forward or reverse. When reversing, the application will produce an audio signal.

When reversing, a **Swap direction** button will appear.

▶ Press the **Swap direction** button, if the calculated driving direction is accidentally wrong.



## Changing section control settings

During work, the section control settings can be changed in the section control setup.

➔ Menu ➔ [Section control tab](#).

A guideline on how to change the section control settings is provided in chapter ➔ [Section control settings](#).

## Creating a field boundary

When during starting of the task, **New boundary** is selected, boundary recording will be activated as soon as the task starts. The following buttons are available:

- Auto recording
- Point recording
- Finish recording

### Auto recording, device dependent

This applies when the checkbox 'device independent' was not checked at task starting.

This button will be toggled ON by default, which means, the boundary will automatically be generated while working.

To stop auto recording temporarily,

- ▶ press the button and auto recording will now be toggled OFF. The green border will disappear.
- ▶ Press the button again to continue recording. The green border will show up again.



## Auto recording, device independent

This applies when the check box 'device independent' was checked at task starting.  
This button will be toggled OFF by default.

To start recording the boundary

▶ press the button again to toggle recording ON.

A green border will show up around the button.



Pause recording when you don't want the boundary to be recorded the way you drive, for example while making a turn in the field corner, or when reversing.

To pause the recording

▶ press the button again to toggle recording OFF.

The green border will disappear.



## Point recording

▶ Press this button to add an individual point to the boundary.

This option is useful when a field has exactly straight boundaries. In this case the operator can choose to add individual points in every corner of the field.

**Info!** When doing point recording, it is advised to disable **Auto recording** first.



## Finishing recording

▶ Press this button when the boundary is completed.

The application will automatically close the boundary by adding a straight line between the last recorded and the first recorded point of the boundary.

The application will compute the field size based on the recorded boundary.



## Replacing a field boundary

When the recorded field boundary is not satisfying, it is possible to replace the boundary of that field.

▶ Start a task with this field selected as normal.

➡ In Menu ➡ **Field tab**, ▶ press the **Replace boundary** button.



The last used settings for recording (recording point and distance) will be reused.

▶ Proceed as described above for boundary recording.

**Info!** This functionality is not available for fields that are imported from an FMIS.

## Creating a guidance line

When during starting of the task, **New guidance line** is selected, guidance line recording will be activated as soon as the task starts. The following buttons are available

- Set A / Set B point
- Toggle straight / curved mode

### Set A / Set B point

Use this button to set the start and end point of the recorded guidance line. It is recommended to drive forward while doing this.

**Note!** The minimum allowed distance between the A and B point is 20 meters.

After the A and B point are recorded, the application will extend the guidance line in a straight line beyond the recorded points.



### Toggle straight / curved mode

Use this button to toggle between straight and curved recording mode. The button can be toggled while recording the line. This allows you to record a guidance line as a combination of straight and curved segments.



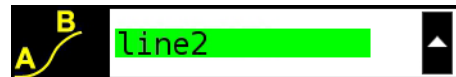


## Changing manual guidance settings

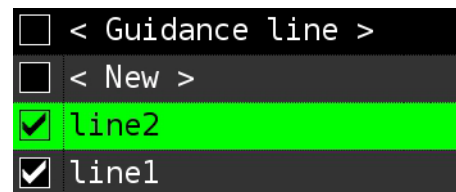
During work, the manual guidance settings can be changed in the field setup ➡ in Menu ➡ **Field tab**.

### Guidance lines

▶ Press the **Guidance line field** to edit, add or select a different guidance line.



When multiple guidance lines are recorded in one field, fast switching can be achieved by selecting the check box in front of the line name.



The switch guidance lines icon will be shown on the GEOCONTROL map to cycle through the selected lines from the GEOCONTROL main screen.



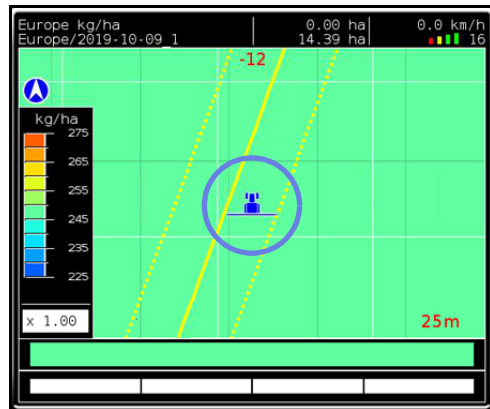
## Nudging

Nudge functionality allows the user to shift a straight guidance line a short distance to the left or right. This functionality can be used to make temporary adjustments to the tractor's path, or to compensate for constant offsets such as working on an incline. Nudging is temporary; the original guidance line will always be stored as recorded. Whenever the current task is closed or the current guidance line is changed, the nudge distance will be reset to 0.

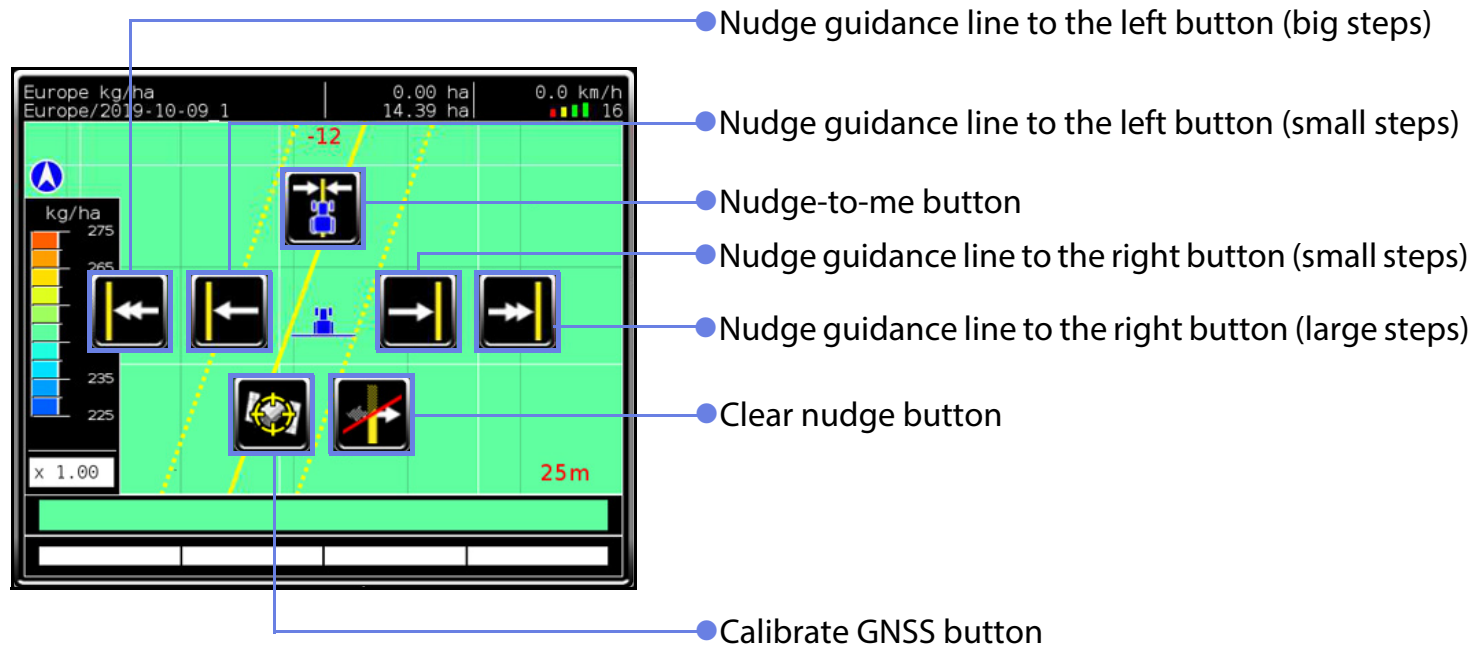
The total nudge distance of the guidance line is limited to 50cm (or 20") to the left or right.

### Nudge menu

- ▶ Start a task with the intended field and guidance line.
- ▶ Position the tractor on the desired position on the field.
- ▶ Press the tractor depiction on the screen.



The **Nudge menu** pops up



During working

## Nudge buttons

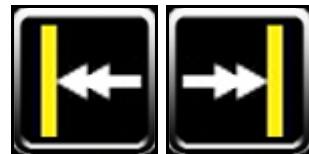
- ▶ By pressing the **Nudge-to-me button** on top of the Nudge menu the guidance line will be set right under the tractor axis.



- ▶ The guidance line can be nudged in small steps to the left or right by pressing the **left or right nudge buttons (small steps)**. The size of the steps (1 - 30cm) can be defined in the Nudge configuration screen. ➡ in Menu ➡ Field tab



- ▶ The guidance line can be nudged in large steps to the left or right by pressing the **left or right nudge buttons (large steps)**. The size of the steps (1 - 50m) can be defined in the Nudge configuration screen. ➡ in Menu ➡ Field tab



- ▶ By pressing the **Clear nudge button** on the bottom of the Nudge menu, the nudge value will be reset to 0.



The current nudge value can be seen in a text box under the current line distance. A nudge to the right will be shown as positive (+), and a nudge to the left will be shown as negative (-).



The nudge buttons will be enabled only if the following conditions are met:

- The distance to the guidance line is less than 25 meters
  - The angle to the guidance line is less than 45 degrees
  - The tractor is driving forward or standing still
- Otherwise, the main screen nudge buttons will be disabled.

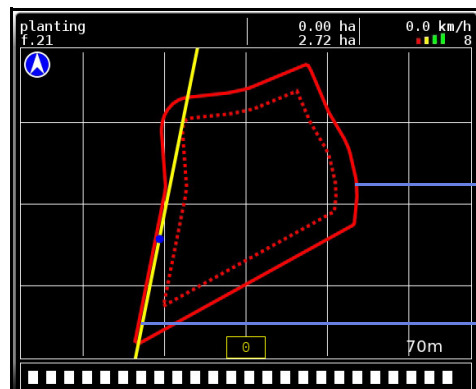
**Note!** All nudge buttons are hidden when a field boundary is being recorded.

## Headland Control

The **Headland Control toggle button** in the main screen appears as soon as a field boundary is available. It allows for toggling between 3 states:

- Work the entire field regularly
- Work the headland only
- Work the main field only

### Entire field



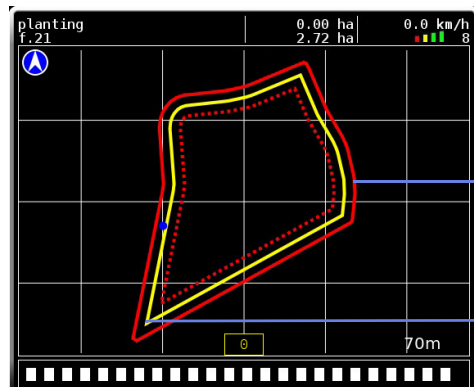
Use this state to work regularly and make no difference between main field or headland.



● Boundary section shutoff: Field boundary

● Guidance lines: Recorded guidance line

## Headland only



Use this state to get manual guidance parallel to the field boundary, while working the headland.



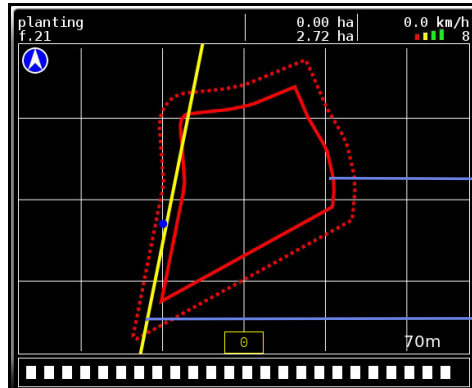
● Boundary section shutoff: Field boundary

● Guidance lines: Parallel to the field boundary

**Note!** In this state, the application uses the given offset from the field boundary to the first headland guidance line!

➡ Menu ➡ Field tab, ➡ Field settings screen, ➡ C (offset)

## Main field only



Use this state to work first the interior of the field before working the headlands.



● Boundary section shutoff: Headland boundary

● Guidance lines: Recorded guidance line

**Note!** In this state, the application uses the given headland width!

➡ Menu ➡ Field tab, ➡ Field settings screen, ➡ A (headland)



## Calibrate GNSS position

This function is required if there is a deviation between earlier recorded guidance line or field boundary and the current position. The deviation can be caused by positioning inaccuracies inherent in the GNSS signal. Whenever you start a task that includes an earlier recorded field boundary or a guidance line, verify the GNSS deviation.

Proceed as follows if the field contains a field boundary:

- ▶ Start the task.
- ▶ Make sure, the guidance and headland settings match the distances and offsets on the field.
  - ➔ Menu ➔ **Field tab**, ➔ **Field settings screen**
- ▶ Drive onto the first track in the field.
- ▶ Toggle to the Headland only mode. On the map, you will now see a guidance line parallel to the field boundary.

Now ideally the distance to the closest guidance line will be zero. If not, this will be caused by GPS deviation; hence the GNSS position needs to be calibrated.

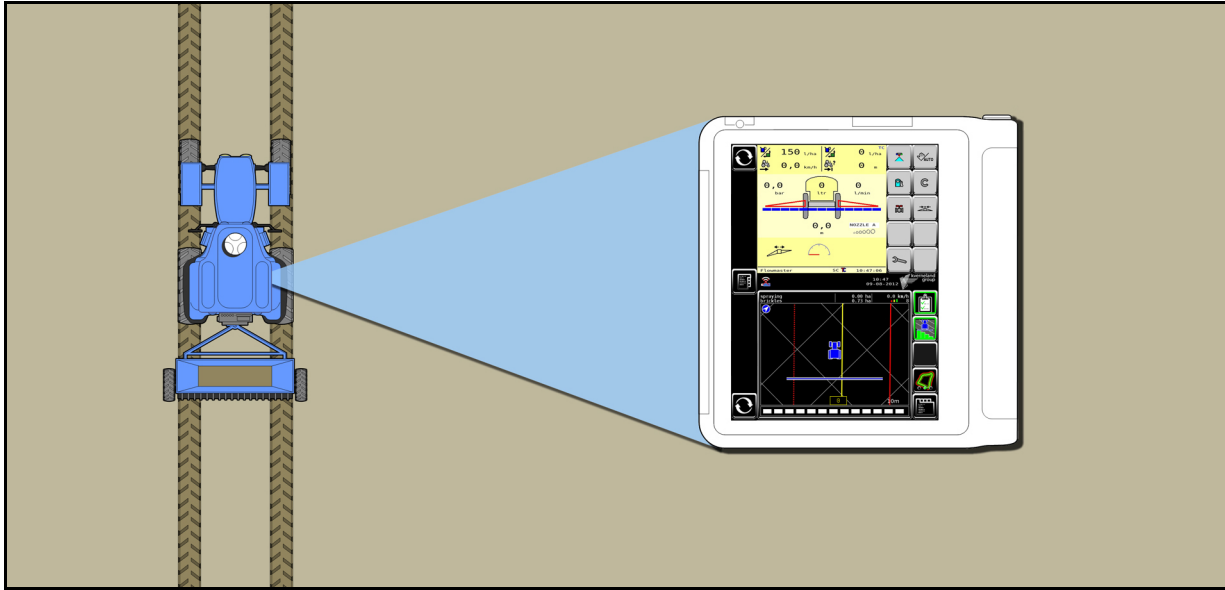
- ▶ In Menu ➔ **Field tab** or ➔ **Nudge menu**, press the **Calibrate GNSS button**.



The GNSS position will now be shifted in a direction perpendicular to the guidance line.

You may need to repeat this procedure when standing on the perpendicular field side to also compensate for GNSS deviation in that direction.

If the field does not contain a field boundary, but a guidance line, follow the same procedure but with using the guidance line instead of the field boundary.



GNSS inaccuracies require GNSS calibration.

## Clearing coverage map and totals

In some cases it may be useful to clear the coverage map and the totals of a task. This can only be done while the task is stopped.

- ▶ Stop the task that you want to clear.
- ▶ In ➡ Menu ➡ Task tab, press the clear task button.



- ▶ Restart the task by pressing continue in the start task pop-up.



# Data management

Data management consists of importing and exporting task data, creating work reports and editing data.

Data management is done in ➡ Menu ➡ [Data management tab](#).

## Task data import

- ▶ Insert a USB stick with taskdata. Taskdata must be in the folder \TASKDATA on the USB stick.
- ▶ To import task data, press the **Import** button.



A pop-up window will appear asking for confirmation.



- ▶ Press the **Confirm** button.

- A progress bar will appear to indicate the status of the copy action.

When there is data available in the application, this will be exported to a folder **\TASKDATA-yy-MM-dd-hh-mm-ss** on the USB stick as a backup. If required, this data can be further handled on the home PC.

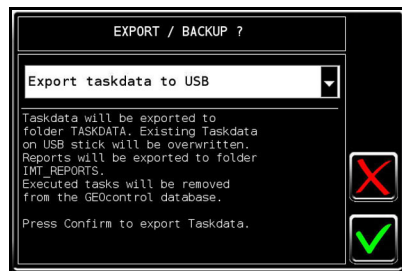
All taskdata and data that was earlier imported from FMIS will be removed from the application, before the new set of taskdata is imported. Fields and field boundaries that are created on the terminal will be kept.

After import, the imported data and tasks are directly ready for use.

## Exporting task data and html reports

► To export task data, press the **Export** button.

A pop-up window will appear asking for confirmation.

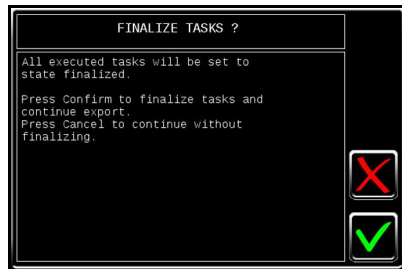


► Make sure that the option **Taskdata** is selected.



► Press the **Confirm** button.

A second pop-up window will appear asking whether tasks should be finalised



► Press **Confirm** if you want to finalise your tasks before exporting.

► Press **Cancel** to continue the export without finalising tasks.

● A progress bar will appear to indicate the status of the copy action.

When exporting, all data will be exported. Finished tasks will be deleted from the terminal. Tasks that have not been executed will not be deleted from the terminal, and can be selected for execution later on.

Taskdata will be exported to the folder \TASKDATA on the USB stick. If this folder was already available on the USB stick, the content of this folder will be deleted prior to exporting.

HTML data is exported to the USB stick on folder \IMT\_REPORTS and can be reviewed with most internet browsers on the pc.

- After **Export taskdata to USB** is executed, a pop-up window will appear indicating **EXPORT SUCCESSFUL**.



## Field backup

To be able to exchange fields (field boundaries and guidance lines), customers, farms and workers between terminals, please use the **IsoMatch field backup** functionality. This functionality allows you to copy fields to another IsoMatch terminal or restore field data after a database reset. On the receiving terminal, the data will be added to the existing data.

► To export task data, press the **Export** button.



A pop-up window will appear.



► Select the option **IsoMatch field backup**.

► Press the **Confirm** button.

● A progress bar will appear to indicate the status of the copy action.

**Note!** This functionality is only available on IsoMatch Tellus 1.12, IsoMatch Tellus Go 1.02 and higher.

● A progress bar will appear to indicate the status of the copy action.



## Import field data

This functionality can be used in order to import work data from any other IsoMatch terminal.

The imported data (field boundaries, guidance lines, customers, farms and workers) will be added to the existing data on the terminal and which itself will stay preserved.

**Note! Import field data** functionality is enabled only when an USB stick with exported taskdata in the folder TASKDATA is connected to the terminal.

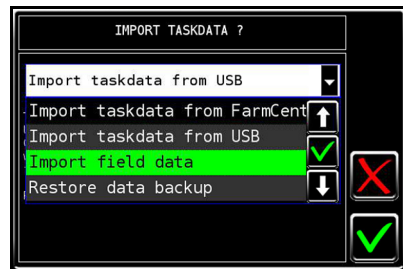
► To import field data, press the **Import** button.



A pop-up window with a drop down menu will appear.

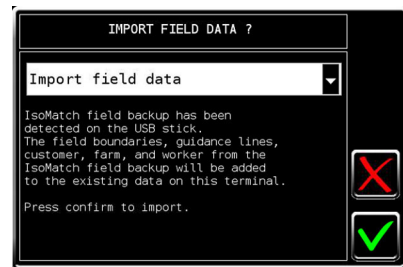


- ▶ Choose the option **Import field data** in the drop down menu.



- ▶ Confirm the selection in the drop down menu.

A pop-up window will appear asking for confirmation.



- ▶ Make sure that the option **Import field data** is selected.

- ▶ Press the **Confirm** button.

- A progress bar will appear to indicate the status of the import action.
- After **Import field data** is executed, a pop-up window will appear indicating **IMPORT SUCCESSFUL**.



## Backup and restore

You can use this functionality in order to safeguard all GEOCONTROL data by backing it up on a USB stick and reuse it by restoring that at a later point in time.

**Note!** This functionality is available on IsoMatch Tellus 1.13, IsoMatch Tellus Go 1.03 or higher.

## Backup all data

To make a back up of complete GEOCONTROL data, please use **Backup all data** functionality.

All GEOCONTROL data including TASKDATA, coverages, timelogs, etc. are backed up into an archive file which is stored in the folder \IMT\_GEO\_BACKUP on the USB stick.

► Insert a USB stick. To export or back up, press the **Export** button.



A pop-up window will appear.



► Select the option **Backup all data**.

► Press the **Confirm** button.

A progress bar will appear to indicate the status of the backing up action.

## Restore data

To restore previously backed up GEOCONTROL data, please use the **Restore data backup** functionality. All existing data on the terminal will be replaced by the data of the backup file.

► Insert a USB stick. To import or restore, press the **Import** button.



If there is **Taskdata** (in the folder \TASKDATA) and a compatible archive file in \IM-T\_GEO\_BACKUP folder on the USB stick, a pop-up window as shown below will appear:



► Select the option **Restore data backup** and press the **Confirm** button.

A progress bar will appear to indicate the status of the restore action. After the restore, GEOCONTROL will be restarted automatically.

## Adding data to the lists

Data can be added or edited in the application. This is useful for the content of exported task data or html reports.

► Press the corresponding **Edit** button to view and edit data.



**Info!** The editing is available for locally created tasks only!

## Clearing the database

If for some reason the database content is corrupted or, if you want to clean up the database, you can clear the entire database.

**Warning!** This will clean the entire content including all section control settings and recorded field boundaries

► Press the **Clear database** button.



# Section control settings

## General explanation of the section control settings

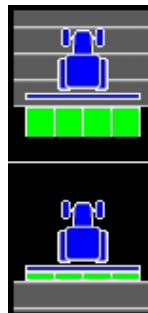
### Margin on /Margin off

This is the distance that the implement sections will start earlier or stop later, in order to create overlap on the headland. This is especially useful to compensate for errors in the (d) GNSS signal or to guarantee field coverage. Separate margins for starting and stopping can be specified.

For example when spraying against diseases, set this parameter to a higher value. When no overlap is allowed, for example during corn seeding, set the margin to 0 m. Apply a negative margin when a buffer area is required, for example due to a large spreader pattern.

**Important!** The value for the margin can be set between 2 m and -2 m.

**Exception!** For spreaders, the margin off can be set as low as -12 m. This margin can be used to shut down the spreader sections early upon approaching the headland.



## Overlap percentage

This is the amount of overlap that is allowed when working on the same area. For each section, if the amount of overlap is exceeded, this section will be shut off.

**Important!** Set this parameter to a higher value to avoid gaps. We recommend not setting the value to 100%, to avoid unwanted switching on of sections while driving on the already worked headland.

For precision drills, set this value to 50% for a theoretically well covered headland or triangle. Set to a higher value to add some more coverage on triangles.



## Boundary percentage

This is the amount of coverage that is allowed outside of the field boundary. If the amount of coverage is exceeded, the sections will be shut off.

**Important!** To avoid spraying or spreading outside the boundary, set these settings to 0 %.





# General explanation of the implement settings

## Connection type

Choose which attachment method was used to connect the implement to the tractor. The 'hitch' option implies the implement to be fixed to the tractor. If the 'trailed' option is selected, an extra pivot point is calculated between the tractor and the implement.



## Important!

- For trailed implements, if the rotating movement is executed too slow, virtually move the implement axle forward by decreasing  $C_i$  and increasing  $B_i$ , make sure the sum of  $B_i$  and  $C_i$  does not change.
- When reversing, the implement is assumed to be straight behind the tractor.
- If the above functionality for trailed implements is not desired, select the option for hitched implements. In this case  $B_i$  is the total distance from hitch point to application point.

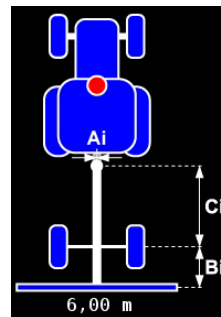
## Implement distance settings

In this tab, set the distance to the application point of the implement. For hitched implements measure the distance from the hitch point. For trailed implements enter both the distance from the tow bar to the implement axle and from the implement axle to the application point.

**Important!** Check the table in the following page and measure/determine this distance for your implement.

For spreaders, this is the distance to the center point of the spreading pattern on the ground. This is in most common cases half of the working width. However, for practical reasons when needing to turn on the headland, the distance may be reduced to half the working width minus 7 meter.

**Info!** If the data cannot be edited here, refer to the [Implement settings screen](#).



## Delay time switch ON/OFF

This is the amount of time it takes for the implement to react on section control commands. The application will compensate for the reaction time of the implement by looking ahead this amount of time, regardless of the speed. Different time values for switching on and switching off can be entered. For example, for seeders, this is the time between the command given by the GEOCONTROL and seeds dropping in the soil.

**Important!** For all types of machines, standard values/ranges are given in the table. However, check the applied values before working with them with the help of [Finetuning the section control settings](#).

**Info!** If the data cannot be edited here, refer to the [Implement settings screen](#).



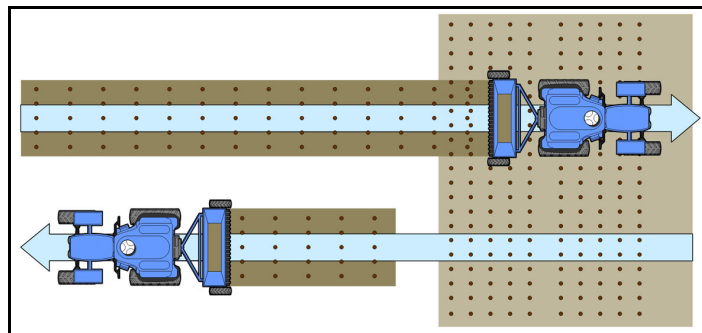
## Recommended settings for Kverneland and Vicon implements

Type Platform	Sprayers FMA	Spreaders EDW/EDW2	Precision drills PSD	Seeders ESA
Margin on [m] Margin off [m]	personal preference	personal preference	personal preference	personal preference
Overlap [%]	80	80	50	90
Boundary [%]	0	80	50	50
Implement distance [m]	1.2 - 6 (measure!)	refer to spreading table of your machine!	0.9 - .... (measure!)	2.0 - .... (measure!)
Delay time switch ON [sec]	0.5 (air closed nozzles: 0.3)	1.0	0.1 - 0.5	1.5 - 3.0
Delay time switch OFF [sec]	0.5 (air closed nozzles: 0.2)	0.5	0.1 - 0.5	1.5 - 3.0

# Finetuning the section control settings

## Step 1: Verifying the Delay time switch ON/OFF of the implement

**Important!** Before doing this step, make sure the margins are set to 0 and the implement offsets are correct.

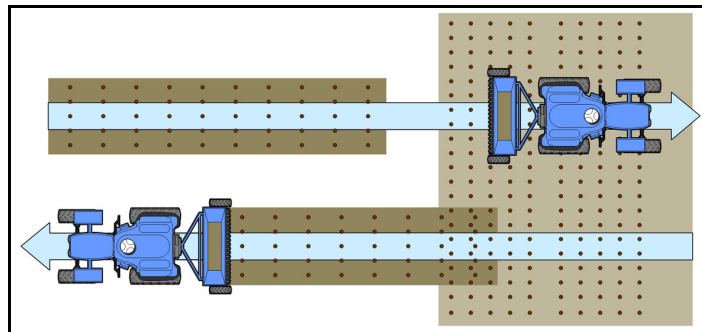


● The implement reacts too late.

▶ Increase Delay time switch OFF.



▶ Increase Delay time switch ON.



● The implement reacts too early.

▶ Decrease Delay time switch OFF

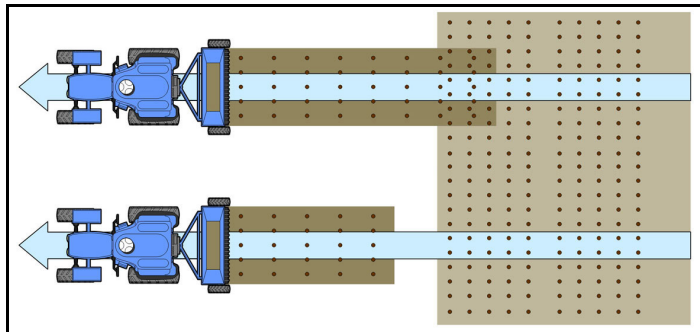


▶ Decrease Delay time switch ON.



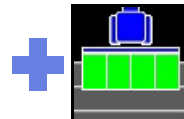
## Step 2: Determine the desired margin

In this step the amount of desired overlap when starting and stopping can be specified. Set these to your own preferred value.

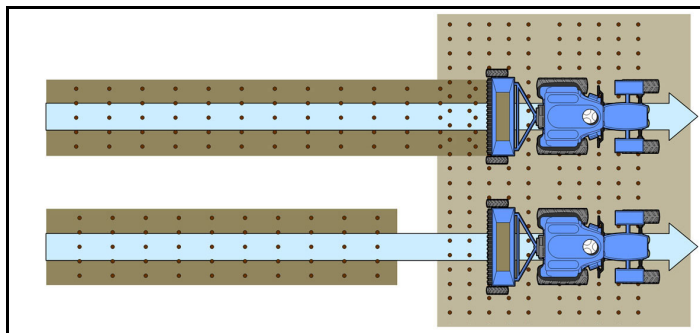
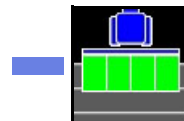


● Desired margin switching on the sections:

▶ Set a positive margin on.

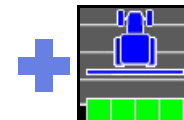


▶ Set a negative margin on.



● Desired margin switching off the sections:

▶ Set a positive margin off.

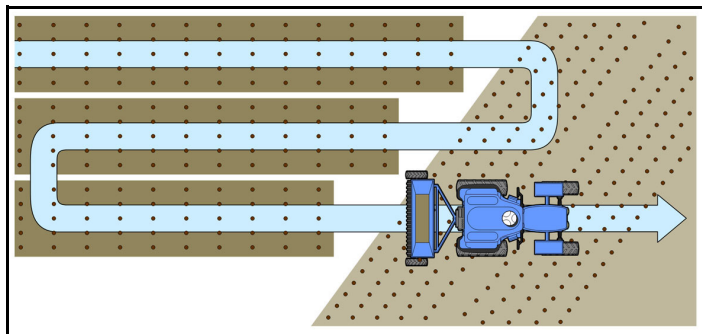


▶ Set a negative margin off.



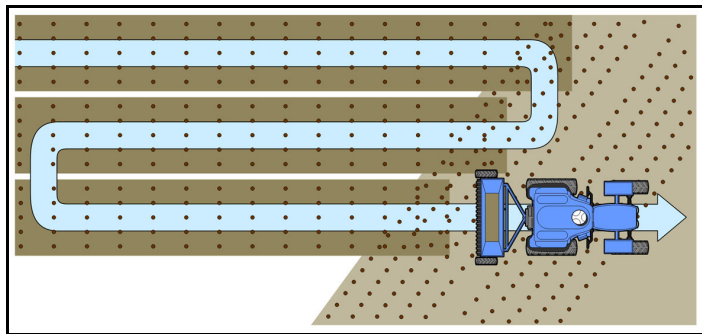
### Step 3: Determine the desired overlap percentage

If the overlap on triangles is not correct, set the overlap percentage to compensate for this.



● Too little overlap.

▶ Increase the overlap percentage.



● Too much overlap.

▶ Decrease the overlap percentage.



## How to calculate the Delay time switch ON/OFF

*Change of Delay time switch ON/Off [sec] = desired change [cm] x 0.036 / speed [km/h]*

### Example 1

When driving of an already cultivated headland, 40 cm has been cultivated twice, operating speed was 5km/h.

▶ Decrease the Delay time switch ON with  $40 \times 0.036 / 5 = 0.29$  seconds (round to 0.3 seconds).

### Example 2

When driving on to an already cultivated headland, there is a 60 cm gap in between cultivations, driving speed was 10 km/h.

▶ Increase the Delay time switch OFF with  $60 \times 0.036 / 10 = 0.22$  seconds (round to 0.2 seconds).

**Important!** In order to check whether Delay time switch ON or OFF should be decreased or increased, refer to [🔄Finetuning the section control settings](#).

# Overview of symbols



Task



New task



Continue task



Select task



Section control/overlap percentage



Rate control



Menu



Customer



Farm



Field



Total Area



Effective time



Ineffective time



Total volume



Total mass



Effective distance



Ineffective distance



Edit





Edit task



Boundary section control



New boundary



Boundary add point



Boundary auto recording



Boundary finish recording



Data



Reset database



Import USB



Export USB



Implement/Device



Email



Phone



Street



Town



Postcode



Worker



Configuration



Margin on



Margin off



Implement width



Tractor



Delay time switch ON



Delay time switch OFF



System settings



GNSS



Lightbar settings



Serial port



USB to serial port



Number of sections



Delete



Swap direction



Baudrate



Abort



Confirm



Exit



New guidance line



Set guidance A-point



Set guidance B-point



Straight/curved guidance line



Calibrate GNSS



Toggle guidance line



Headland Control - entire field



Headland Control - headland field



Headland Control - main field only



Headland settings



Working width



Track overlap



Headland width



Track offset



Nudge-to-me



Nudge small steps



Nudge large steps



Clear nudge