

# Operating Instructions

## *TRACK-Leader*

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30302432-02-EN

Read and follow these operating instructions.

Keep these operating instructions in a safe place for later reference.

## Legal notice

### Document

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# 1 For your safety

## 1.1 Basic safety instructions



Please read the following safety instructions carefully before operating the product for the first time.



- Read the operating instructions to the agricultural device which you want to control by using the product.



## 1.2 Intended use

The software may be only used in connection with agricultural equipment and machines. The software may be used only outside public roads during work in the field.

## 1.3 Layout and meaning of warnings

All safety instructions found in these Operating Instructions are composed in accordance with the following pattern:

	 <b>WARNING</b>
	<p>This signal word identifies medium-risk hazards, which could potentially cause death or serious bodily injury, if not avoided.</p>

	 <b>CAUTION</b>
	<p>This signal word identifies low-risk hazards, which could potentially cause minor or moderate bodily injury or damage to property, if not avoided.</p>

### NOTICE

This signal word identifies actions which could lead to operational malfunctions if performed incorrectly.

These actions require that you operate in a precise and cautious manner in order to produce optimum work results.

There are some actions that need to be performed in several steps. If there is a risk involved in carrying out any of these steps, a safety warning will appear in the instructions themselves.

Safety instructions always directly precede the step involving risk and can be identified by their bold font type and a signal word.

#### Example

1. **NOTICE! This is a notice. It warns that there is a risk involved in the next step.**
2. Step involving risk.

## 1.4 User requirements

- Learn how to operate the display correctly. The display must not be operated by anyone who has not read the Operating Instructions.

- Please read and carefully observe all safety instructions and warnings contained in these Operating Instructions and in the manuals of any connected machines and farm equipment.

## 2 About these Operating Instructions

### 2.1 Applicability

These Operating Instructions apply to all modules of the TRACK-Leader application from Mueller-Electronics.

You can find the software version from which these Operating Instructions apply in imprint.

### 2.2 Target group for these Operating Instructions

These Operating Instructions apply to all users of the TRACK-Leader software and related additional modules.

### 2.3 Layout of operating instructions

The operating instructions explain step by step how you can perform certain operations with the product.

We use the following symbols throughout these Operating Instructions to identify different operating instructions:

Type of depiction	Meaning
1. 2.	Actions that must be performed in succession.
⇒	Result of the action. This will happen when you perform an action.
⇒	Result of an operating instruction. This will happen when you have completed all steps.
☑	Requirements. In the event that any requirements have been specified, these must be met before an action can be performed.

### 2.4 Layout of references

If any references are given in these Operating Instructions, they will appear thus:

Example of a reference: [→ 8]

References can be identified by their square brackets and an arrow. The number following the arrow shows you on what page the chapter starts where you can find further information.



## 3 Product description

TRACK-Leader is a modern system enabling drivers of agricultural vehicles to keep exact lanes in the field.

The system has a modular design, so that the user can add further functions.

### 3.1 Performance description

Available functions of the software are subject to a license purchased for the modules.

There are two module types:

- Basis module: Prerequisite for additional modules.
  - TRACK-Leader II
- Additional modules: can be combined as required.
  - SECTION-Control
  - TRACK-Leader TOP
  - HEADLAND-Control
  - VARIABLE RATE-Control

#### 3.1.1 TRACK-Leader II

Module type: Basis module. This is the prerequisite for all other modules.

##### Prerequisites

To use this module, you need to meet the following preconditions:

- Plugin "TRACK-Leader" must be activated.
- License "TRACK-Leader II" must be activated.

To learn how to activate plug ins and licenses, read the installation and operating instructions to the display.

##### Functions

The following functions will be available after activation:

- Display of parallel tramlines to support the driver when driving in parallel tracks.
- Identification of obstacles located in the field.
- Warning of obstacles captured.
- Warning of reaching a field border.
- Saving of work results in two formats.
- SECTION-View – display of sections which must the driver must switch on and off by hand to avoid overlaps.

#### 3.1.2 SECTION-Control

Module type: Additional module.

With SECTION-Control you can specify for any connected job computer what parts of the agricultural device it shall switch off, so that you avoid overlaps.

This can be for example sections when working with a field sprayer. In these instructions we always refer to sections of a field sprayer.

##### Prerequisites

To use this module, you need to meet the following preconditions:

- Plugin "TRACK-Leader" must be activated.

- License "TRACK-Leader II" must be activated.
- License "SECTION-Control" must be activated.
- The display must be connected to an ISOBUS job computer supported by SECTION-Control or to an SC box from Mueller-Electronics.
- The job computer must be configured.

**Functions**

The following functions will be available after activation:

- All functions which you receive through the "TRACK-Leader II" function.
- Control of sections of connected agricultural device.
- Control of spread amounts via a job computer connected.

**3.1.3 TRACK-Leader TOP**

Module type: Additional module.

With TRACK-Leader TOP you can specify for the steering job computer of Reichardt how it shall steer the vehicle, so that it follows the tramlines set up through TRACK-Leader II.

**Prerequisites**

To use this module, you need to meet the following preconditions:

- Plugin "TRACK-Leader" must be activated.
- License "TRACK-Leader II" must be activated.
- License "TRACK-Leader TOP" must be activated.
- A steering job computer must be fitted, installed and configured on the tractor.
  - TRACK-Leader TOP works with steering job computers of the Reichardt company: Steering ECU PSR, from software version 02-112

**Functions**

The following functions will be available after activation:

- Automatic steering of vehicle along defined tramlines.

**3.1.4 HEADLAND-Control**

Module type: Additional module.

The HEADLAND-Control module (also known as Headland Management) enables the headland area to be treated separately from the rest of the field.

**Prerequisites**

To use this module, you need to meet the following preconditions:

- Plugin "TRACK-Leader" must be activated.
- License "TRACK-Leader II" must be activated.
- License "HEADLAND-Control" must be activated.

**Functions**

The following functions will be available after activation:

- Display of parallel tramlines in headland.
- If you also use SECTION-Control, then the software can process separately the headland and the inside of a field.

**3.1.5 VARIABLE RATE-Control**

Module type: Additional module.

**Prerequisites**

To use this module, you need to meet the following preconditions:

- Plugin "TRACK-Leader" must be activated.
- License "VARIABLE RATE-Cont" must be activated.

**Functions**

With "VARIABLE RATE-Control" you can:

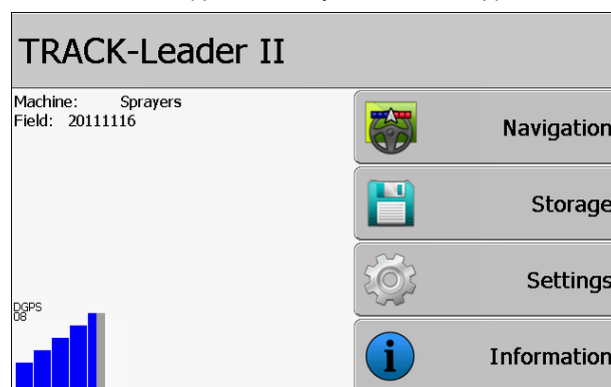
- import prescription maps in shp format.
- Transfer target values from prescription maps to a job computer.

## 3.2 Screen structure

Your terminal screen will look slightly different, depending on the modules that you have activated.

### 3.2.1 Start screen structure

The Start screen appears when you launch the application.








TRACK-Leader II start screen

The start screen allows you:

- To switch to further screens.
- To read the status of the GPS signal.

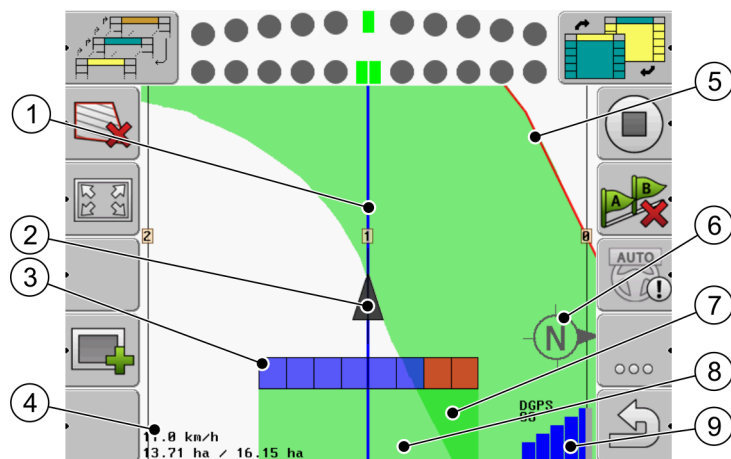
**Controls**

Function icon	Function
 <b>Navigation</b>	Change to preparation screen.
 <b>No machine</b>	Navigation with SECTION-Control is not possible. The software is missing information about the agricultural device connected. Read more in chapter: Cooperation with application TaskManager [→ 74]
 <b>Storage</b>	Change to "Storage" screen.
 <b>Settings</b>	Change to "Settings" screen.
 <b>Information</b>	Change to "Information" screen.

### 3.2.2 Screen structure

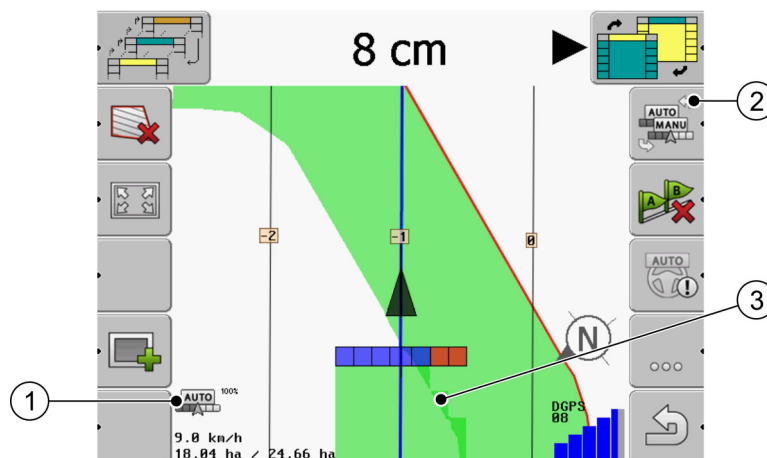
The screen is what is displayed when navigation is started.

The information shown on the screen varies depending on whether only TRACK-Leader II or also SECTION-Control are activated.



Screen when SECTION-Control is deactivated

①	Tramlines	⑤	Field border
②	Position of GPS Receiver	⑥	Compass
③	Working bar	⑦	Areas driven and processed twice
④	Counter and status information	⑧	Areas driven and processed
		⑨	Status of GPS connection



Change in screen when SECTION-Control is activated

①	Working mode of SECTION-Control	③	The dark color shows only areas treated twice.
②	Function icon for changing the working mode		

#### Tramlines

Tramlines are lines helping the driver keep parallel tracks.

There are two tramline types:

- Tramline A-B – this is the tramline set up as the first one.
- Activated tramline – this is the tramline which the vehicle just follows. It is marked in blue.
- Not activated tramlines – tramlines not activated.

### Position of GPS Receiver

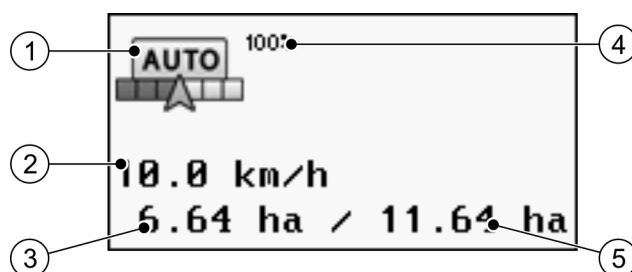
The position of the GPS Receiver is marked with a black arrow on the screen.

### Working bar

The working bar includes a number of squares. Each square represents one section of an agricultural device.

See also: Using SECTION-View

### Counter and status information



Information in counter area

①	Working mode of SECTION-Control	④	Defined degree of overlap
②	Current speed The speed is tracked based on the GPS position and can differ from that in the job computer.	⑤	Total size of the field within field borders. Only if you have captured the field border.
③	Area counter - Area still to be processed if you have captured the field border. - Area already processed if you have not captured any field border.		

### Field border

The field border shows the exact position of the field to the software and is the base for calculating the total size of a field.

### Compass

Shows where the north is.

### Travelled and treated surfaces

The surfaces to the rear of the machine icon are marked in green. This green color can have any of the following meanings, depending on the configuration:

- Travelled surface

If you are only using TRACK-Leader II, the travelled surface is marked. This is marked regardless of whether or not the machine treated the surface during this travel.

- Treated surface

If you are using SECTION-Control, the treated surfaces are marked. Surfaces over which the machine has travelled but which have not been treated are therefore not marked.

If you want the software only to mark treated surfaces in green, proceed as follows:

- Activating SECTION-Control

or

- Mount and activate the operating position sensor

The operating position sensor recognizes that an agricultural device has been enabled, and transmits this information to the terminal.

### Status of GPS connection

Shows the status of the DGPS connection.

See also: Checking the DGPS signal quality [→ 52]

## 3.3 Using test licenses

When ready for delivery, a 50-hour test license is activated for all additional modules.

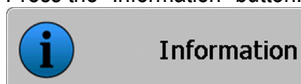
You can test each module for 50 hours. The time starts running only when you have activated a module.

After 50 hours have passed, all functions for which the test license has expired will be deactivated.

### Procedure

This is how you can check how long you can use a test license:

1. Open the starting screen of TRACK-Leader.
2. Press the "Information" button:





⇒ The "Info" screen appears.

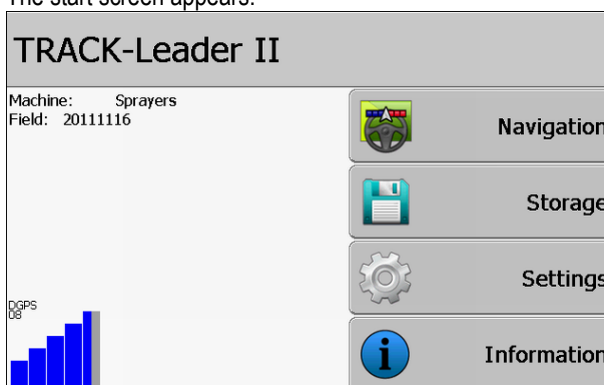
3. In the table you can see for how many hours you can still use a test license.

## 4 Basic control principles

### 4.1 Initial start-up

#### Procedure

1.  - Switch on the display.
2. Wait until all applications and job computers have been loaded.
3.  - Open the "Selection menu" application.
4. Select "TRACK-Leader".  
⇒ The start screen appears:



⇒ You have started TRACK-Leader II.

5. Read now how to configure TRACK Leader. [→ 22]

### 4.2 Controls

This chapter will provide you with an overview of all of the function icons which appear in the software, as well as their function.



On each icon, after pushing the icon, you can see the graphic representation of what is just happening.
























In the table you can find two columns with function icons:

- Function icon – shows the function symbol in the current software on new displays.
- Alternative function icon – shows the function symbol in the past software version on older displays.



















The function of both function icons is the same.

#### Function symbols TRACK-Leader II and SECTION-Control

Function symbol	Alternative function icon	Chapter with more information	Consequences
		Identify field border [→ 53]	On the navigation screen a red line is drawn around the field. This is the field border.





Function symbol	Alternative function icon	Chapter with more information	Consequences
		Deleting a field border [→ 54]	The field border will be deleted.
		Starting track recording [→ 47]	Function icons appear only when SECTION-Control is deactivated and you have no operating position sensor.
			
		Change display in screen [→ 57]	The whole field will be displayed.
			Vehicle surroundings will be displayed.
		Changing working mode of SECTION-Control [→ 56]	SECTION-Control will change the working mode.
		Create tramline A-B [→ 55]	Point A of the A-B tramline will be set.
		Deleting tramlines [→ 58]	Tramlines will be deleted.
		Set reference point [→ 49]	There are two possible consequences: "GPS Calibration" screen will be called up. - Reference point will be set.
	 	Calibrating GPS signal [→ 51]	There are two possible consequences: "GPS Calibration" screen will be called up. GPS signal will be calibrated.
		Shifting tramlines [→ 57]	Tramlines will be shifted to the current position of the vehicle.





Function symbol	Alternative function icon	Chapter with more information	Consequences
		Changing the work screen terminal [→ 57]	3D view will be activated
		Changing the work screen terminal [→ 57]	2D view will be activated
		Display other function icons	
		Loading field data [→ 61]	
		Saving field data [→ 61]	
		Viewing recorded tracks [→ 64]	
			
		Importing field data from GIS [→ 62]	
		Exporting field data for GIS [→ 62]	




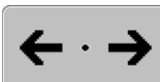






### TRACK-Leader TOP

The following function icons appear on the screen only when automatic steering "TRACK-Leader TOP" is deactivated. You can read about what information appears when "TRACK-Leader TOP" is activated in chapter: Automatic steering TRACK-Leader TOP [→ 71].







Function icon	Alternative function icon	Function
		Automatic steering TRACK-Leader TOP is deactivated or not available at all.
		Steer the vehicle to the left. The function key does not work when TRACK-Leader TOP is deactivated.



Function icon	Alternative function icon	Function
		Steer the vehicle to the right. The function key does not work when TRACK-Leader TOP is deactivated.

### Obstacles

Function icon	Alternative function icon	Chapter with more information	Consequences
		Detecting obstacles [→ 55]	Screen with obstacle identification appears.
			Obstacle will be shifted.
			
			
			
			Obstacle will be placed in selected position.

### HEADLAND-Control

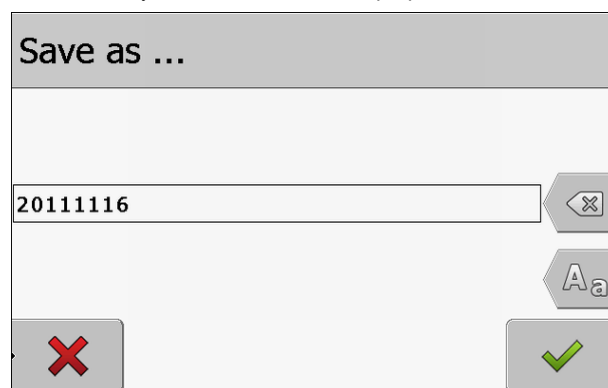
Function icon	Alternative function icon	The software is in this state when the icon appears	This happens after pushing the function key next to the icon
		HEADLAND-Control is deactivated and has never been activated for this field before. The field border has not been captured yet.	Cannot print.
		HEADLAND-Control is activated. Appears only when field border is captured.	Headland will be displayed.
		Now you can process the inside of the field. SECTION-Control only processes	Parallel driving in headland will be activated.

Function icon	Alternative function icon	The software is in this state when the icon appears	This happens after pushing the function key next to the icon
		the inside of the field. Sections will be switched off when changing to headland.  Parallel driving in the inside of the field is activated.	
		Now you can process the headland.	Parallel driving in the inside of the field will be activated.

### 4.3 Inputting data





You will need to enter numbers and letters when entering field names or registration information.

The data entry screen is used for this purpose.





The data input screen when saving

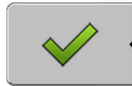
#### Controls

Function icon	Function
	Delete character
	Switch between upper and lower case
	Cancel input
	Confirm input

#### Procedure

-  - Select the desired characters.
-  - Apply selected character.  
⇒ The characters have been applied. The cursor shifts one position forward.

3. Input further characters.



4. - Once you have entered all of the characters, confirm the input.

## 4.4 Using the screen light bar

The screen light bar is provided in order to help the driver to follow the tramline. This indicates to the driver when he has moved off the trace and also once he has returned to the track.

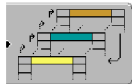
The following types of terminal screen light bars are available:

- The screen light bar in graphic mode
- The screen light bar in text mode
- SECTION-View

In addition to the screen light bar, a direction arrow appears on the screen, which indicates the correct steering direction.

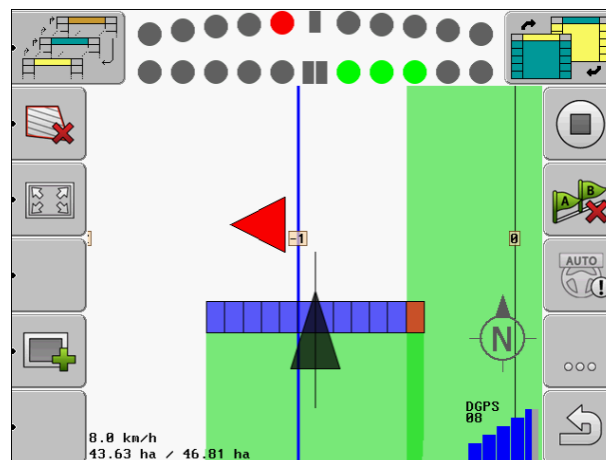
### Procedure

To enable the screen light bar:



1. - Press repeatedly until the screen light bar appears in the header of the terminal screen.

### 4.4.1 The screen light bar in graphic mode



Screen light bar – graphic mode

The screen light bar in graphic mode consists of two bars:

- The current deviation from the tramline is displayed in the lower bar.
- The deviation is displayed at a specific distance in the upper bar. See the "Preview [→ 25]" parameter.

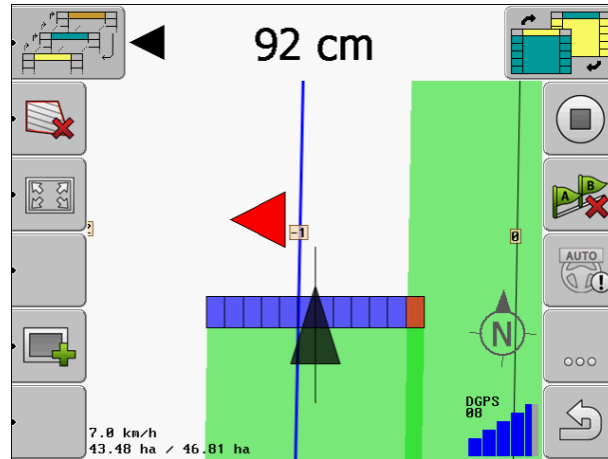
Each circle indicates a specific deviation in inches. See the "Sensitivity [→ 25]" parameter.

As the angle of travel can vary for technical reasons, the sensitivity value is doubled for display in the preview bar.

When steering, the aim should be to ensure that the central squares remain lit.

#### 4.4.2 The screen light bar in text mode

In text mode, the screen light bar indicates how many yards you are from the tramline. This also indicates the direction which you must steer in order to return to the trace. There is no preview in text mode.



Screen light bar – text mode

## 5 Configuration

This chapter clarifies all settings which you have to configure.

**You have to configure the following**

Module	Chapter
TRACK-Leader II	General settings Configuring TRACK-Leader II [→ 24]
SECTION-Control	General settings Configuring TRACK-Leader II [→ 24] Configuring SECTION-Control [→ 26]
TRACK-Leader TOP	General settings Configuring TRACK-Leader II [→ 24] Configuring TRACK-Leader TOP [→ 35]
HEADLAND-Control	No additional settings are needed
VRC	No additional settings are needed

### Procedure

This is how you open the configuration screens:

1. Switch to the "Settings" screen:



⇒ The following screen will appear:



2. Click the line with required application.

⇒ A list with parameters will appear.

In the following sub-chapters you will find the explanation of the parameters.

### 5.1 Configuring "General" settings

In this menu you can set the display on the screen and active some functions.

## SECTION-Control

This parameter determines whether SECTION-Control is activated or deactivated.

Potential values:

- "Yes"  
SECTION-Control is activated. Machine data such as swathwidth are automatically transferred from the connected job computer.
- "No"  
SECTION-Control is deactivated. TRACK-Leader II is activated. You have to enter the machine data yourself. See: Machine profiles [→ 37]

## Connection with TM

This parameter determines whether data are exchanged with the "TaskManager" application.

Potential values:

- "Yes"  
Data such as field borders, A-B lines and reference points are exchanged between SECTION-Control and the TaskManager application. SECTION-Control only then operates when a task is initiated in TaskManager. The field data is saved to the "Taskdata" file via TaskManager. You must set "Yes" when you edit tasks via the TaskManager application.
- "No"  
No data are exchanged between SECTION-Control and the TaskManager application. You should set "No" when the TaskManager application is running in "SC mode". Otherwise, it will not be possible to load and treat fields.

## Documentation for GIS

This parameter decides whether work results logged by an ISOBUS job computer shall be saved for GIS.

The work results will be saved during work and exported to \*.shp format.

The following work results will be saved.

- Actually spread and/or sown amounts delivered from ISOBUS job computer to SECTION-Control.

Potential values:

- "Yes"  
Work results will be collected for export while working.
- "No"  
No work results will be collected.

## Acoustic warnings

This parameter determines whether a warning tone sounds when in the vicinity of field borders and recorded obstacles.

Potential values:

- "Yes"
- "No"

### Trace transparency

This parameter determines whether and how overlaps are displayed on the screen.

Potential values:

- „0“  
Overlaps are not displayed.
- „1“ – „6“  
Intensity of colors with which overlaps are marked.
- „3“  
Default

### Show grid

Displays a grid on the navigation screen.

The distances between the grid lines will differ according to the input swathwidth. The grid lines are aligned along the North-South and East-West axes.

### Smooth course

If the GPS receiver mounted on the roof of the tractor cab swings sharply, the driving route displayed on the screen can appear very jagged.

The "Smooth course" option smoothens out the displayed driving route.

The requirements in this user guide are only applicable when using a A100 GPS antenna. Other settings may be correct when using other GPS antennae.

Potential values:

- "Yes"  
When you are using TRACK-Leader TOP and the A100 GPS antenna is connected to the steering job computer.
- "No"  
When you are not using TRACK-Leader TOP and the GPS antenna is connected to the terminal.

### Run demo mode

Starts a simulation of the application.

## 5.2 Configuring TRACK-Leader II

### Screen light bar

Type of screen light bar.

Potential values:

- "Deactivated"  
Deactivates the screen light bar
- "Graphic Mode"  
Activates screen light bar in graphic mode
- "Textmode"  
Activates screen light bar in text mode
- "SECTION-View"



Activates SECTION-View

### **Tramline numbering**

This parameter determines whether and how the implemented tramlines are numbered.

Potential values:

- "absolute"  
Tramlines have fixed numbers. The A-B tramline is numbered 0. The tramlines to the left and right of this A-B tramline are numbered.
- "relative"  
The tramlines are re-numbered each time that the machine enables a new tramline. The enabled tramline is always numbered 0.

### **Sensitivity**

Setting of Lightbar sensitivity.

How many inches of deviation shall be reached for a LED to be activated on the Lightbar?

- Standard value: 12 inches  
This value means a sensitivity of 6 inches to the left and 6 inches to the right.

### **Preview**

This parameter determines the number of feet in front of the vehicle at which the preview display of the terminal screen light bar will calculate the future position of the vehicle.

- Default: 8.7yard

See also: The screen light bar in graphic mode [→ 20]

### **Swinging angle**

The program assumes from a defined angle that the vehicle wants to swing to a tramline. Then this tramline will be marked in blue. If the vehicle drives with smaller angle deviation towards a tramline, then this track will not be recognized as a new current tramline.

- Standard value: 30 degree.
- Value for TRACK-Leader TOP: 70 degrees

### **Dist. contour points**

When recording the "A-B tramline" in contour mode, points are saved continuously. The more points, then more precisely the "A-B tramline" and other tramlines are drawn. This however slows down the work of the display.

The parameters specifies in which distance the points shall be set. The optimum value can differ from field to field and from machine to machine.

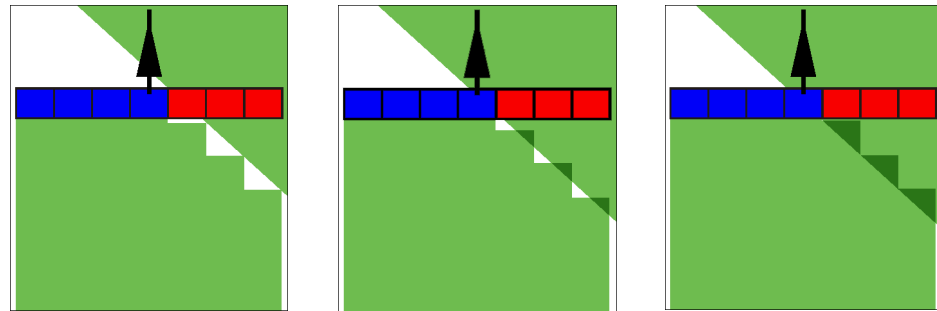
- Standard value: 200 inches

## 5.3 Configuring SECTION-Control

### Degree of overlap

The degree of overlap when treating a wedge-shaped area.

The set "Degree of overlap" is influenced at the outer sections by means of the "Tolerance of overlap" parameter.



0% degree of overlap

50% degree of overlap

100% degree of overlap

Potential values:

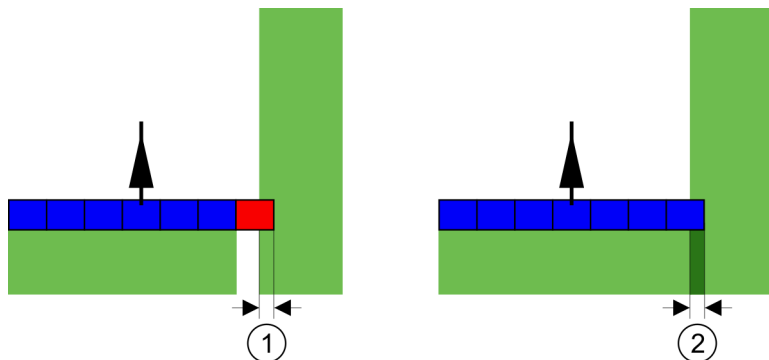
- 0% – Each section is only switched on when exiting a treated area when the vehicle has completely exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 1% over the treated surface.
- 50% – Each section is only switched on when exiting a treated area when 50% of the vehicle has exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 50% over the treated surface. At a "Degree of overlap" of 50%, the "Tolerance of overlap" function has no effect.
- 100% – Each section is only switched on when exiting a treated area when 1% of the vehicle has exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 100% over the treated surface.

### Tolerance of overlap

"Tolerance of overlap" refers to the tolerance of the outermost sections to overlaps, when travelling in parallel and when exceeding the field borders on headlands.

The "Tolerance of overlap" only applies to the outermost left and right sections. No other sections are affected by this parameter.

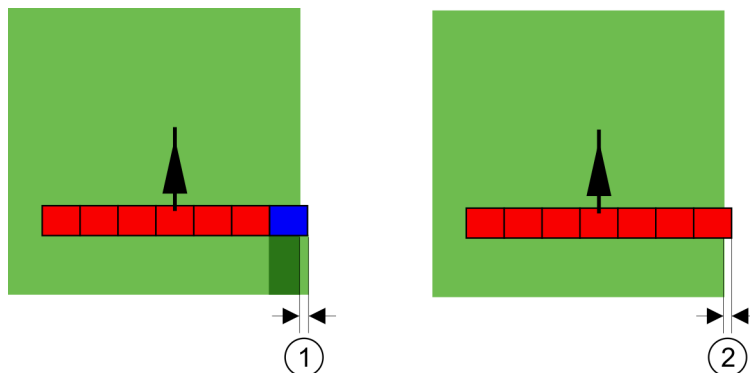
The following illustrations show how the "Tolerance of overlap" parameter works with a "Degree of overlap" of 0%. The set tolerance of overlap can be seen underneath the illustrations.



Tolerance of overlap for 0% degree of overlap – in both cases the work was done with a 25cm overlap.

<p>① Tolerance of overlap 0cm In this case, the section is immediately switched off.</p>	<p>② Tolerance of overlap 30cm In this case, the section is not switched off, as the current overlap is lower than 30cm.</p>
--	--

If you have set the "Degree of overlap" parameter to 100%, the "Tolerance of overlap" parameter plays a vital role when leaving an area already processed. This is relevant for example when turning in headland which has already been processed.



Tolerance of overlap for 100% degree of overlap – in both cases the area processed was skipped by 25cm.

<p>① Tolerance of overlap 0 If only 1% of the section skips the area which has already been processed, the entire section will be switched on.</p>	<p>② Tolerance of overlap 30cm The tolerance of overlap enables avoiding unnecessary overlaps. The right tolerance is only switched on when more than 30cm of processed area is skipped.</p>
--	--

Potential values:

- **Recommendation:** Set the "Tolerance of overlap" to 30cm when using the A100 GPS Receiver.
- Tolerance 0cm  
The outermost section is switched on or off when entered or exited by the track being travelled.
- Other values  
The outermost section is switched on or off when the overlap exceeds the value.
- Maximum value  
Half of the section width of the outermost section.

### Inactivity

Two parameters are possible:

- Inactivity of ON
- Inactivity of OFF

For both parameters, you will need to indicate how much time must pass before a section valve responds to a signal from the terminal. Inactivity is thus the time which elapses until the opening pressure of a nozzle is increased (when switching on) or shut off (when switching off).

This value is required for automatic section switching. This is dependent on the type of section valve.

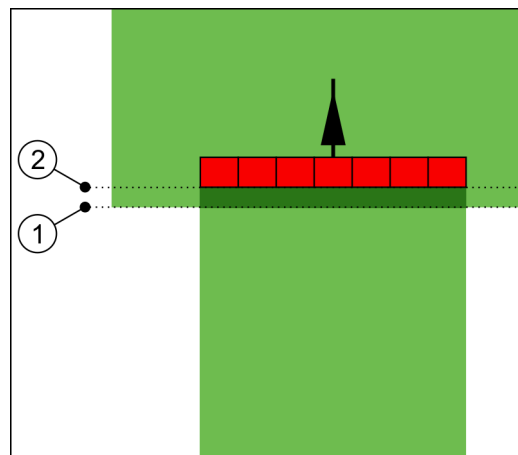
### Example

When a section passes over an already treated surface during field spraying, this must be immediately switched off. To do this, the software sends a signal to the section valve to switch off. As a result, the pressure in the section valve is shut off. This lasts until there is no further flow from the nozzles. The duration is approx. 400 milliseconds.

The result is that the section applies an overlap for a length of 400 milliseconds.

In order to prevent this, the parameter "Inactivity of OFF" must be set to 400ms. Now, the signal is sent to the section valve 400 milliseconds earlier. As a result, the application can be interrupted or restarted at exactly the right point in time.

The illustration below shows how the inactivity function works. The illustration shows actual behavior, not the indication on the screen.



*Inactivity of OFF is set to 0. A too brief delay time results in overlapping application.*

①	At this point, the section valve receives a signal to shut off.	②	At this point, the field sprayer stops application.
---	---	---	---

Potential values:

- "Inactivity of ON"  
Enter the delay when switching a section on.  
e.g.
  - 400 ms solenoid valve
  - 1200 ms electrically actuated valve
- "Inactivity of OFF"  
Enter the delay when switching a section off.  
e.g.
  - 300 ms solenoid valve
  - 1200 ms electrically actuated valve

### Machine model

This parameter determines how the position of the working bar and sections shall be calculated.

With this parameter active, the software will always try to calculate precisely the correct position of each section. On the screen the working bar closely follows the tractor lane. Thanks to this, the display of drives on the screen and work of SECTION-Control are more accurate than they would be with this parameter deactivated.

Potential values:

- "self propelled"  
Settings for self-propelled agricultural equipment.
- "trailed"  
Settings for agricultural equipment towed by a tractor.
- "Deactivated"  
No machine will be simulated. Exact calculation of the position of sections is deactivated. The working bar is shown in the position where the GPS Receiver is located. Calculated areas will be imprecise.

### 5.3.1 Calibrating Inactivity of ON and Inactivity of OFF

This chapter is intended for advanced users.

Before reading the chapter:

- Read how you can control the display.
- Learn how you control SECTION-Control.

The standard values of parameters "Inactivity of ON" and "Inactivity of OFF" are set for work with most field sprayers.

**When should you calibrate?**

Calibrate parameters in the following instances:

- If using a different agricultural device with SECTION-Control.
- If the agricultural device switches too late or too early when driving on an area already processed.
- If the agricultural device switches too late or too early when leaving an area already processed.

In the chapters below you will learn how to calibrate the parameters.

The chapters and examples apply to the example of a field sprayer. For different agricultural devices, please proceed accordingly.

#### Calibration phases

Calibration consists of several phases:

1. Calibration preparations
2. Travelling the field for the first time
3. Travelling the field for the second time
4. Marking the application borders
5. Calculating correction values
6. Correcting the "Inactivity of ON" and "Inactivity of OFF" parameters

The phases are explained in detail in the following chapters.

#### Calibration preparations

You will need the following equipment and personnel in order to perform the calibration:

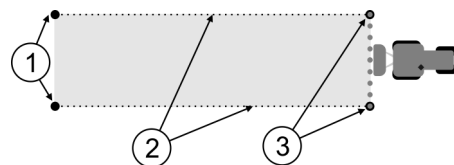
- Two observers – two people who will mark the treated areas with stakes.

- Tools for marking the treated areas:
  - Barrier tape, approx. 220 - 330 yard
  - 8 stakes for making marking on the field
- Field sprayer with tank loaded with clean water.

### First travel

In this phase of the calibration, you will need to travel across the field along a single track.

The illustration below shows the points which must be marked before and after the travel. Instructions on how to do this are given beneath the illustration.



Results of the first travel

①	<b>Stakes</b> To mark the outer ends of the sections prior to travel	③	<b>Stakes</b> To mark the outer ends of the sections after travel
②	<b>Barrier tape between the stakes</b> To mark the borders of travel		


### Procedure

To prepare the field for inactivity calibration:

1. Start a new navigation with SECTION-Control.
  2. Position the field sprayer at the start of the travel. The travel must not be positioned close to the field border, in order to give you sufficient space for the second travel.
  3. Extend the linkages.
  4. Mark the ends of the outer sections with stakes.
  5. Travel 110 to 220 yards in a straight line before beginning to apply the clean water.
  6. After 110 to 220 yards, stop and switch off the field sprayer.
  7. Save the travel in the TRACK-Leader. This will enable the calibration to be repeated.
  8. Mark the ends of the outer sections with stakes.
  9. Connect the stakes with barrier tape. This marks the borders of travel across the field.
  10. Fix the barrier tape to the ground with stones or earth.
- ⇒ You have now performed the first travel, and marked the application borders.

### Second travel

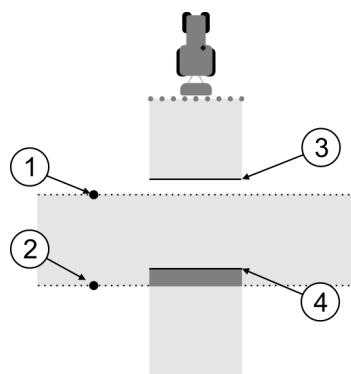
In this phase, you will need to treat the area which you travelled through in the first travel at a 90° angle.

	<p><b>⚠ CAUTION</b></p>
	<p><b>Injury from the travelling field sprayer</b> Observers who are assisting with the calibration are at risk of being struck by the linkages.</p> <ul style="list-style-type: none"> <li>◦ The observers should be made properly aware of this risk. Such hazards should be explained to them.</li> <li>◦ Ensure that the observers maintain a sufficient distance from the spray linkages at all times.</li> <li>◦ Stop the sprayer immediately if an observer is too close to the sprayer.</li> </ul>

In this phase, you will require the help of one or two further people. These people will observe the travel and the behavior of the field sprayer, and mark out the application borders.

They should be appropriately trained and warned of the potential dangers.

The illustration below shows where the observers must stand and the objectives that they must achieve.



Travel 2

①	Position of Observer 1	③	This line marks the position at which the nozzles should begin spraying when the machine exits the treated area.
②	Position of Observer 2	④	This line marks the position at which the nozzles should stop spraying when the machine enters the treated area.

**Procedure**

- The tank should be filled with clean water.
  - The observers should stand at a safe distance from the linkages of the field sprayer.
  - Navigation is started using the first travel.
  - SECTION-Control should be in automatic mode.
1. Position the field sprayer at a distance of approx. 110 yards from, and an angle of 90° to the travelled area.
  2. Drive at a constant speed (e.g.: 5 miles/h) over the already treated area. Apply the water as you do so.
  3. The observers must stand on the previously marked travel borders at a safe distance from the linkages.
  4. The observers must observe the points at which the field sprayer stops and starts spraying, as it passes along the already travelled points.
- ⇒ You will now know how the sprayer behaves when travelling along an already treated area.

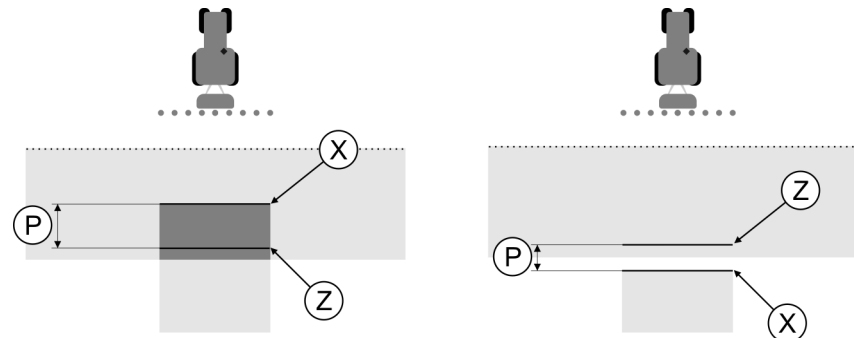
You may wish to repeat this process several times in order to ensure better accuracy of the results.

### Marking the application borders – for Inactivity of OFF

In this phase, you will need to mark where your sprayer stops application when you enter a treated area. You must also determine where application should stop in future.

This will tell you whether the sprayer is switching off too early, or too late.

The illustrations below show the lines which you will need to mark in the field in order to be able to calculate the "Inactivity of OFF" parameter.



Lines for the "Inactivity of OFF" parameter. Left: Sprayer switches off too late. Right: Sprayer switches off too early.

P	Distance between desired application line Z and actual application line X	X	Actual application line This is where the sprayer stops application.
		Z	Desired application line This is where the sprayer should stop application. A slight overlap of 3.9 inch should be planned due to the pressure release time.

In both cases (left and right), the "Inactivity of OFF" parameter is incorrectly set:

- Left: Sprayer switches off too late. The inactivity period must be extended.
- Right: Sprayer switches off too early. The inactivity period must be reduced.

#### Procedure

1. Compare the markings in the field with the calculations.

⇒ You now know whether the sprayer is switching off too early, or too late.

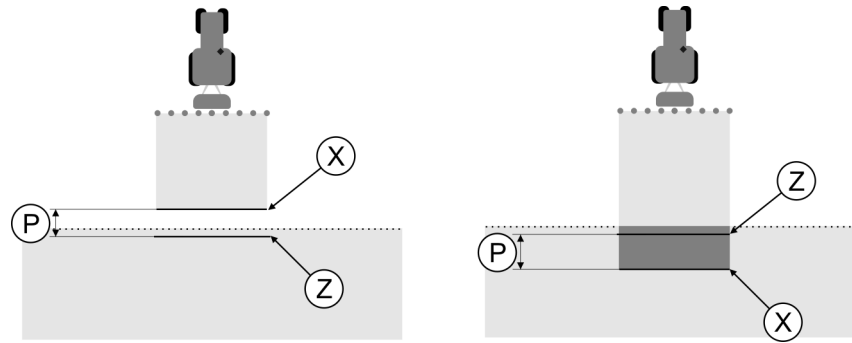
### Marking the application borders – for Inactivity of ON

In this phase, you will need to mark where your sprayer begins application when you exit a treated area. You must also determine where application should begin in future.

This will tell you whether the sprayer is switching on too early, or too late.

The illustrations below show the lines which you will need to mark in the field in order to be able to calculate the "Inactivity of ON" parameter.





Lines for the "Inactivity of ON" parameter. Left: Sprayer switches on too late. Right: Sprayer switches on too early.

P	Distance between desired application line Z and actual application line X	X	Actual application line This is where the sprayer begins application.
		Z	Desired application line This is where the sprayer should begin application. A slight overlap of 3.9 inch should be planned due to the pressure build-up time.

In both cases (left and right), the "Inactivity of ON" parameter is incorrectly set:

- Left: Sprayer switches on too late. The inactivity period must be extended.
- Right: Sprayer switches on too early. The inactivity period must be reduced.

#### Procedure

1. Compare the markings in the field with the calculations.  
⇒ You now know whether the sprayer is switching on too early, or too late.

#### Calculating correction values

In the final phase, you will need to determine:

- Which parameters must be altered.
- Whether the current inactivity must be increased or reduced.

You must now calculate the number of milliseconds by which to adjust the incorrectly set parameter.

To do this, you will need to calculate a so-called correction value.

In order to be able to calculate the correction value, you need to find out how fast the field sprayer was travelling. This speed must be entered in inch/milliseconds.

The following tables lists a number of speeds and their conversion into inch/ms:

Speed in miles/h	Speed in inch/ms
3.7 miles/h	0.06 inch/ms
5 miles/h	0.0858 inch/ms
6.2 miles/h	0.109 inch/ms

#### Procedure

The correction value should be calculated as follows:

1. **[Distance P]: [Speed of field sprayer] = Correction value**
2. The currently set "Inactivity of ON" or "Inactivity of OFF" parameter must then be corrected by this value.

## Changing the Inactivity parameter

You must now adjust the "Inactivity of ON" and "Inactivity of OFF" parameters.

### Procedure

- Alter the parameters using the following rule of thumb:
  - If the sprayer switches on too late, it needs more time. The inactivity period must be extended.
  - If the sprayer switches on too soon, it needs less time. The inactivity period must be reduced.
- Calculate a new value for the Inactivity parameter.  
 Perform this step separately for the "Inactivity of ON" or "Inactivity of OFF" parameters  
 If the field sprayer switches on or off too late:  
 Extend the current inactivity period by the correction value  
 If the field sprayer switches on or off too early:  
 Reduce the current inactivity period by the correction value

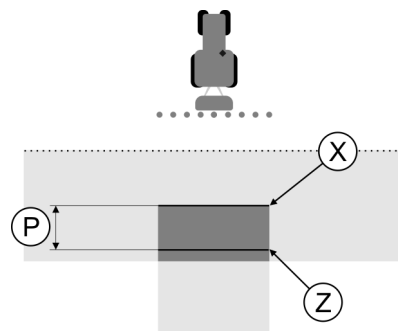
### Example

A field sprayer traveled at a speed of 5 miles/h. This corresponds to 0.0858 inch/ms.

After the second travel, the distance P was measured. The distance was 31.2 inch.

The "Inactivity of OFF" parameter is currently set to 450ms.

The field sprayer was switched off too late when travelling over a treated surface. Point Z lied in front of Point X along the direction of travel. The lines were marked as in the illustration below:



When travelling over the treated surface, the field sprayer switched off too late

- Calculate the correction value  
**[Distance P]: [Speed of field sprayer] = Correction value**  
 $31.2 : 0,0858 = 364$
- Calculate a new value for the Inactivity parameter.  
 As the field sprayer switches off too late, "Inactivity of OFF" must be increased by the correction value:  
 $364 \text{ (correction value)} + 450 \text{ (set "Inactivity of OFF")} = 814 \text{ (new "Inactivity of OFF")}$
- Insert value 814 for the "Inactivity of OFF" parameter.

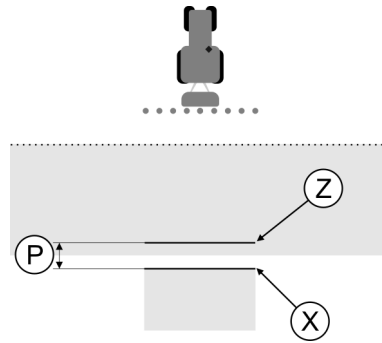
### Example

A field sprayer traveled at a speed of 5 miles/h. This corresponds to 0.0858 inch/ms.

After the second travel, the distance P was measured. The distance was 31.2 inch.

The "Inactivity of OFF" parameter is currently set to 450ms.

The field sprayer switched off too early when travelling over a treated surface. Point Z lied in front of Point X along the direction of travel. The lines were marked as in the illustration below:



When travelling over the treated surface, the field sprayer switched off too early.

1. Calculate the correction value  
**[Distance P]: [Speed of field sprayer] = Correction value**  
 $80 : 0,22 = 364$
2. Calculate the new value for the "Inactivity of OFF" parameter.  
As the field sprayer switches on or off too late, "Inactivity of OFF" must be reduced by the correction value:  
 $450 \text{ (set "Inactivity of OFF")} - 364 \text{ (correction value)} = 36 \text{ (new "Inactivity of OFF")}$
3. Insert value 36 for the "Inactivity of OFF" parameter.

## 5.4 Configuring TRACK-Leader TOP

The following parameters must be set in order to use TRACK-Leader TOP:

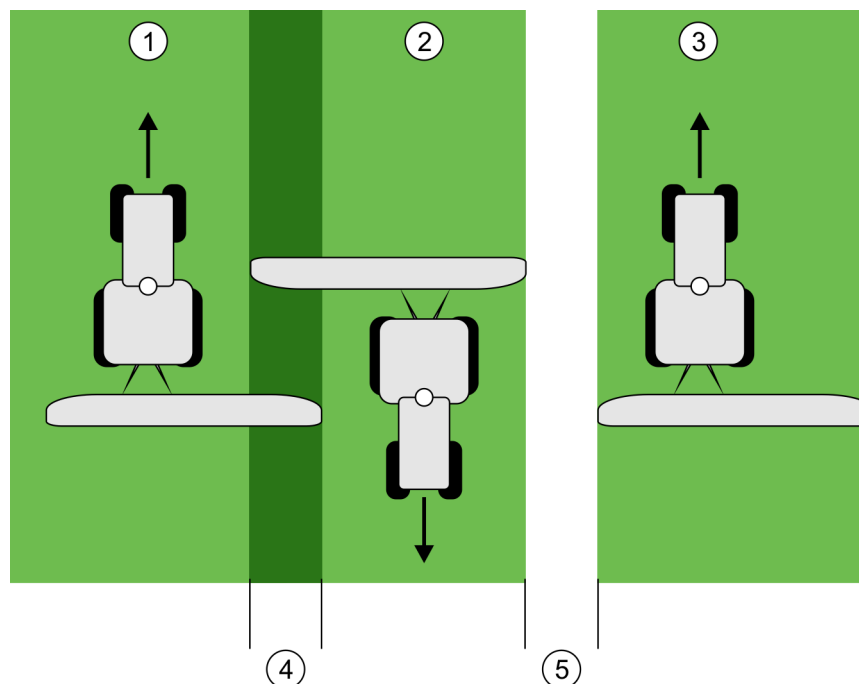
### GPS receiver height

Distance between GPS Receiver and the ground.

Needed for: TRACK-Leader TOP

### Implement offset

You have to enter the machine offset when the agricultural machine, as shown in the picture, works with a offset on one side. Should this parameter be missing, some areas will be processed twice and some skipped.



Work with machine offset, without setting the "Implement offset" parameter

①	First travel	④	Double-processed area
②	Second travel	⑤	Unprocessed area
③	Third travel		

### Mode of operation

If this parameter is allocated any value other than 0, the following occurs:

- A red tramline appears on the work screen. TRACK-Leader TOP will follow the red tramline.
- The machine icon and the linkage icon are shifted to the input value.

Potential values:

- Input a positive value, e.g.: **90cm**  
If the towed equipment is offset to the right.
- Input a negative value, e.g.: **-90cm**  
If the towed equipment is offset to the left.
- Input "0"  
After connecting a job computer in which the entire geometry of the towed equipment is recorded. For example the job computer of a sprayer from Müller-Elektronik.

### Procedure

This is how you determine the right value for this parameter:

1. Ensure that the parameter is set to "0".
2. Start new navigation with TRACK-Leader.
3. Drive your tractor three lanes along the guide lanes, as shown in the image above.
4. Measure the width of the unprocessed area between the second and third drive.
5. Enter the half of the width measured as the value of this parameter.
6. With plus and minus you can set the offset direction for the agricultural machine.

## PSR reaction speed

PSR reaction speed and aggressiveness of the automatic steering. The higher the value, the sharper the steering movements.

## 5.5 Machine profiles

Each machine for which you use the software can have different parameters. You can create profiles for machine settings, so that you avoid setting the parameters every time you start your work.

In the "machine data" area you can enter the parameters of connected agricultural devices and save them as profiles.

You will need the machine data in the following instances:

- When SECTION-Control is deactivated
- When the display is not connected to any job computer.

### 5.5.1 Creating new machine profiles

"Machine" here means a combination of a tractor and an agricultural device.

#### Example

If you have two tractors and two devices in your fleet, you possibly have to create for profiles:


- Tractor A and sprayer
- Tractor B and sprayer
- Tractor A and fertilizer spreader
- Tractor B and fertilizer spreader

Always create all combinations which you actually need as machine profiles. You can save up to 20 machine profiles.

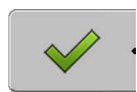
#### Procedure

1. Start the following screen: "Settings":



2.  - Click "add machine data".  
⇒ A screen for data input appears.

3. Enter the denotation of the new machine profile.

4.  - Confirm and save your entry.  
⇒ The "machine data" screen appears.

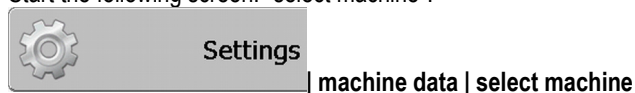
5. Set machine parameters.

### 5.5.2 Selecting from machine profiles


Before you start work, you have to select the machine from your fleet. You select the machine from the machine profiles.

#### Procedure

1. Start the following screen: "select machine":




⇒ The "select machine" screen appears. In this screen all machine profiles you have saved are listed.

2.  - Click on required "Machine profile".

⇒ The "machine data" screen appears.

3. Check machine parameters.

4.  - Leave the screen as soon as the parameters are the current ones.

⇒ The required machine profile will be activated.

⇒ The name of the machine profile activated appears on the starting screen on line "Machine".

### 5.5.3 Machine parameters

You will need the machine parameters in the following instances:

- When you want to create a machine profile for a new machine
- When you want to edit a machine profile

On the pages below you will find the explanation of all machine parameters.

#### Swathwidth

This parameter shows the swathwidth set for a device.

#### No. of sections

Enter the number of sections.

Each section appears as part of the working bar on the screen.

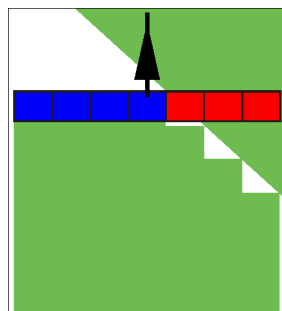
#### Passes

Opens a screen on which you can input the width of the individual pass width.

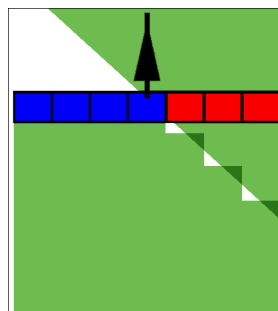
#### Degree of overlap

The degree of overlap when treating a wedge-shaped area.

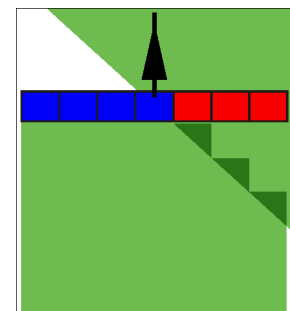
The set "Degree of overlap" is influenced at the outer sections by means of the "Tolerance of overlap" parameter.



0% degree of overlap



50% degree of overlap



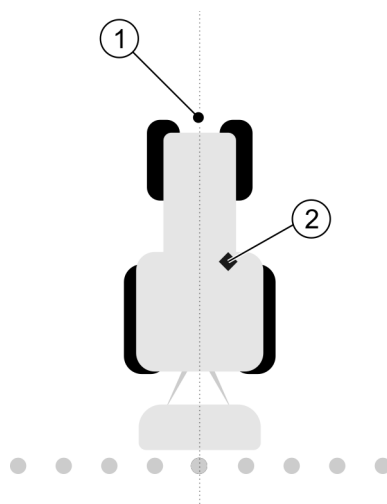
100% degree of overlap

Potential values:

- 0% – Each section is only switched on when exiting a treated area when the vehicle has completely exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 1% over the treated surface.
- 50% – Each section is only switched on when exiting a treated area when 50% of the vehicle has exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 50% over the treated surface. At a "Degree of overlap" of 50%, the "Tolerance of overlap" function has no effect.
- 100% – Each section is only switched on when exiting a treated area when 1% of the vehicle has exited the area. When travelling across a treated surface, the section is first switched off when the section extends up to 100% over the treated surface.

### GPS antenna left/right

In the event that the GPS Receiver is not positioned on the longitudinal axis of the vehicle, this offset must be set here.



Longitudinal axis of the vehicle and GPS Receiver

①	<b>Longitudinal axis of the vehicle</b>	②	<b>GPS Receiver</b> To the right of the longitudinal axis of the vehicle
---	---	---	---

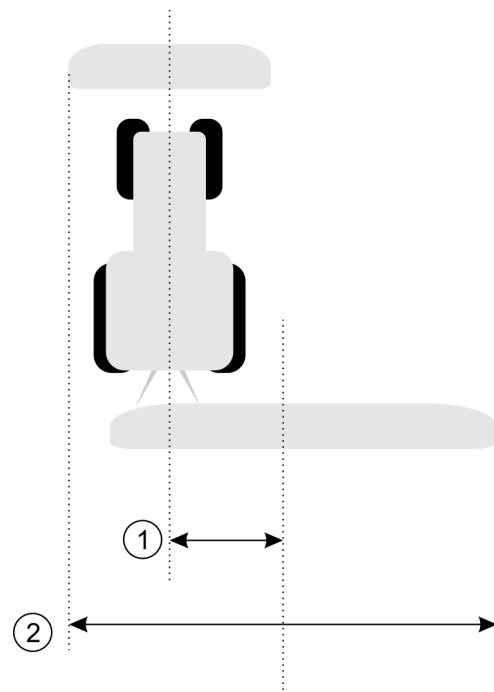
Potential values:

- Input a negative value, e.g.: - 0.20m  
if the GPS Receiver is positioned to the left of the longitudinal axis.
- Input a positive value, e.g.: 0.20m  
if the GPS Receiver is positioned to the right of the longitudinal axis.

### GPS antenna left/right for asymmetric equipment

If using an asymmetric agricultural device, the center of the swathwidth is in a different position than for symmetric devices.

In order to compensate for this difference, you have to adjust the "GPS antenna left/right" parameter set before.



Asymmetric device

①	Distance between the longitudinal axis of the tractor and the center of the swathwidth. The center of the agricultural device will be changed by this distance.	②	Total swathwidth
---	--	---	------------------

**Procedure**

This is how you modify the "GPS antenna left/right" parameter for asymmetric device:

1. Measure the entire swathwidth.
2. Determine the exact center of the swathwidth.
3. Measure the distance between the center of the swathwidth and the longitudinal axis of the tractor.
4. Adjust the value of the parameter:
  - If the center of the swathwidth is moved to the right, add the distance measured to the value of this parameter.
  - If the center of the swathwidth is moved to the left, deduct the distance measured from the value of this parameter.

**GPS antenna front/rear**

Distance of the GPS Receiver from the treatment point. The treatment point may for example be the linkage of a field sprayer.

Potential values:

- Input a negative value. e.g.: - 4.00m  
If the GPS Receiver is to the rear of the treatment point, you should input a negative value.
- Input a positive value, e.g.: 4.00m  
If the GPS Receiver is forward of the treatment point, you should input a positive value.

**Operating position sensor**

Is an operating position sensor fitted on the machine?



The operating position sensor is a sensor which recognizes that an agricultural device is set and delivers this information to the display. The sensor is available for many tractors and can be reached via the signal socket.

Potential values:

- "Yes"
- "No"

### **Inverted sensor logic**

Is the sensor logic of the operating position sensor inverted?

- "Yes" – Treatment recording begins when the operating position sensor is not occupied. This will end when the operating position sensor has been occupied.
- "No" – Treatment recording begins when the operating position sensor is occupied. This will end when the operating position sensor is no longer occupied.

### **Machine model**

This parameter determines how the position of the working bar and sections shall be calculated.

With this parameter active, the software will always try to calculate precisely the correct position of each section. On the screen the working bar closely follows the tractor lane. Thanks to this, the display of drives on the screen and work of SECTION-Control are more accurate than they would be with this parameter deactivated.

Potential values:

- "self propelled"  
Settings for self-propelled agricultural equipment.
- "trailed"  
Settings for agricultural equipment towed by a tractor.
- "Deactivated"  
No machine will be simulated. Exact calculation of the position of sections is deactivated. The working bar is shown in the position where the GPS Receiver is located. Calculated areas will be imprecise.

## 6 Control processes

### 6.1 When using only TRACK-Leader II

1. Drive to the field.
2. Load field data.
3. Prepare navigation.
  - Select machine profile (optional).
  - Select Nav mode.
  - Set tramline.
  - Set tramline interval.
4. Perform preparatory work.
  - Set reference point.
  - Capture field border (optional).
  - Create tramline A-B.
  - Process headland by using HEADLAND-Control (optional).
5. Work.
  - Capture obstacles (optional).
  - Process field (optional).
6. Finish work.
  - Save field data in standard format.
  - Export field data in GIS format.
  - Discard field data.

### 6.2 When using SECTION-Control

1. Drive to the field.
2. Load field data.
3. Prepare navigation.
  - Select Nav mode.
  - Set tramline.
  - Set tramline interval.
4. Perform preparatory work.
  - Contin. navigation.
  - Calibrate GPS-signal.
  - Process headland by using HEADLAND-Control (optional).
5. Work.

- Capture obstacles (optional).
  - Process field (optional).
6. Finish work
- Save field data in standard format
  - Export field data in GIS format
  - Discard field data.

## 6.3 When using the TaskManager application

When you plan your field work on a PC and want to edit the data on a display, use the TaskManager application.

### Start work

#### Procedure

This is how you start work when using TaskManager:

1. Start your order with TaskManager.
  - ⇒ TRACK-Leader will be displayed on the screen.
  - ⇒ When starting an order with the TaskManager application, then the field data will be loaded automatically from TRACK-Leader II.
2. Use TRACK-Leader or SECTION-Control.

### Finish work

#### Procedure

This is how you finish work when using TaskManager:

1. Start the "TaskManager" application.
2. Finish order.



3. - Save data on the USB stick or upload it to the FarmPilot portal.
  - ⇒ All field data generated during work with TRACK-Leader will be stored in the "Taskdata.xml" file.

## 7 Preparing navigation

### 7.1 Selecting nav mode

The Nav mode decides how tramlines shall be created.

The Nav mode is selected on the preparation screen:




There are two Nav modes:

- Nav mode parallel
- Nav mode smoothed contour
- Nav mode identical contour
- Nav mode A Plus [0,0000°]

#### Procedure

1. Switch to the Preparations screen:



2.  - Click "Navmode".
3.  - Select required Nav mode.
4.  - Confirm your entry.

#### 7.1.1 Parallel nav mode

The parallel nav mode is also known as "A-B mode".

Use this mode when you want to treat the field in parallel, straight lines of travel.

#### 7.1.2 "Smoothed contour" nav mode

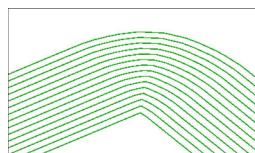
Mode purpose: Curved tramlines, no overlap.

In "Smoothed contour" nav mode, the curvature of each tramline curve is altered. The tramlines are more acute on one side, and rounder on the other.

This thus prevents overlapping. The disadvantage of this navigation mode is that lines of travel which lie far from the A-B tramline will eventually become very acute.

If you notice that the tramline is excessively acute, delete the tramline and create a new A-B tramline. The tramlines are then re-calculated.

#### Example



Tip: Create the A-B tramline so that the inside of the curve is as close as possible to the field border.

#### 7.1.3 "Identical contour" nav mode

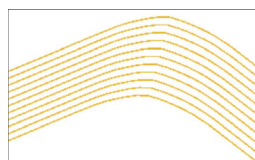
Mode purpose: Curved tramlines with identical curvatures

In identical contour navigation mode, there is no variation in the curvature. Only use this mode for gentle curves.

The disadvantage of this navigation mode is that the distance between the tramlines will eventually become too large. It will then no longer be possible to treat the field accurately using the track-to-track process.

If you notice excessive distances between the tramlines, delete the tramline and create a new A-B tramline.

**Example**



**7.1.4 A Plus navigation mode**

This mode allows you to manually input the geographical direction in which the tramlines should be implemented. To do this, simply input the direction in degrees (between 0° and 360°), and the tramlines are automatically implemented, parallel to each other.

- 0° North
- 180° South
- 90° East
- 270° West

This mode is particularly useful when you know the exact direction in which you need to work in your field.

This mode enables multiple machines to work at the same along precisely parallel tramlines.

**7.2 Setting tramlines**

This Chapter will shown you how to work with tramlines.

Tramlines are the lines displayed on the screen which help you to drive precisely along the desired line of travel.

**7.2.1 Setting the tramline width**

The tramline width is the distance between two tramlines.

The preset tramline width is the swathwidth, and this can be adjusted for individual tasks.

**Example**

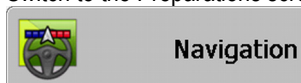
Field sprayer swathwidth = 19.6 yard

You will want to ensure that nothing is left out during field treatment.


Set the tramline width to 19.4 yard for example. The field is then treated with a 7.8 inch overlap.

**Procedure**

1. Switch to the Preparations screen:



2.  - Click on "Tramline width".

3.  - Enter the desired tramline width.

4.  – Confirm this input.

## 7.2.2 Setting the tramline interval

You can set the tramline interval on the Preparations screen.

This enables you to set the the interval at which the tramlines are displayed in bold.

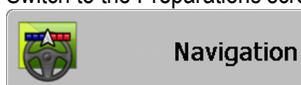
This will make it easier for you to drive along each second or third track.




### Example

If you input the number "2", every second tramline is displayed in bold, whereas inputting the number "3" will display every third tramline in bold, etc.

### Procedure

1. Switch to the Preparations screen:



2.  - Click on "Interval".
3.  - Set the desired tramline interval.
4.  - Confirm your entry.

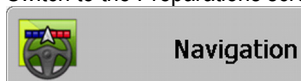
## 7.3 Setting the headland width

The headland width can be set as a multiple of the swathwidth.

The calculation basis for headland width is always the total swathwidth of the machine. This also applies when you have deactivated external sections in the machine job computer. Keep this in mind when setting headland width.

### Procedure

1. Switch to the Preparations screen:



2. Click on the "Headland tramlines" parameter.
  3. Set how many sections the headland shall include.
- ⇒ You have set the headland width.

## 8 Starting navigation

You have two options when starting navigation:

- Starting a new navigation
- Continuing a started navigation

### 8.1 Starting a new navigation

You can start a new navigation in the following cases:

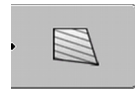
- When you are working a field for the first time.
- When you load the field data for a known field. In this case, all old recorded tracks are deleted. You can however re-use the field borders, tramlines and obstacles.

#### Procedure

1. Switch to the Preparations screen:



2. Set all displayed parameters.



3. - Press.

⇒ A screen appears.

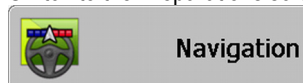
### 8.2 Continuing a started navigation

You can continue navigation in the following instances:

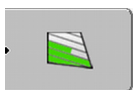
- After suspending the processing of a field.
- After leaving the application.
- After loading data of a field.

#### Procedure

1. Switch to the Preparations screen:



2. Set all displayed parameters.



3. - Press.

⇒ A screen appears.

### 8.3 Starting track recording

You do not need to read this Chapter if:

- SECTION-Control is activated
- You have an operating position sensor

If you do not use SECTION-Control or have not mounted any operating position sensor, the software will not know when your equipment (e.g. sprayer) is working and when it is not. You will therefore need to tell the software when you begin the task.

Recording the tracks enables you to see the parts of the field which you have already travelled through on the screen.

**Procedure**

You have now started a navigation.

1.  - Record tracks.

⇒ The function icon becomes red: 

⇒ A green track appears behind the tractor icon. It is marking your tracks.

## 8.4 Calibrating DGPS

DGPS means "Differential Global Positioning System".

This system is used to determine the position of the vehicle.

**Problem description**

Throughout the course of the day, the Earth is turning and the satellites change their position in the sky. The calculated position of a point will as a result shift. This shift means that the position will after a certain time no longer be up-to-date.

This phenomenon is called a "drift", and can be minimized.

For your purposes, this means that all of the field borders and tramlines which you create during a day will have shifted after a few hours.

**Solution to the problem**

There are two ways of compensating for the drift:

- Using Reference point 1 – By setting a Reference point 1 and calibrating the GPS signal each time before starting work. A free-of-charge way to use the A100 GPS antenna which provides an accuracy of up to +/- 11.8 inch.
- By using a correction signal. A chargeable service provided by the GPS provider. Only for use in conjunction with a very accurate GPS antenna. The GPS signal must be re-calibrated automatically and at regular intervals. This enables an accuracy of less than five inches.

### 8.4.1 GPS with no correction signal

If your GPS does not use a correction signal, you will need to calibrate the GPS signal every time before starting work.

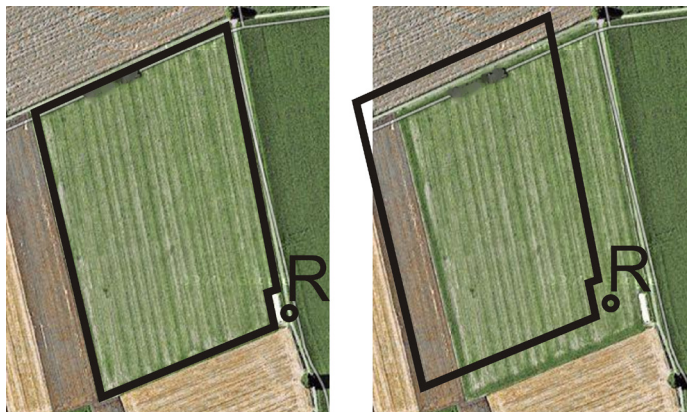
The more precisely you do this, the more precisely your system will operate. Conversely, the less precise the GPS calibration, the less precisely the system might be able to determine the position of the vehicle.

#### What do you need a reference point for?

A reference point will enable you to compare your actual GPS coordinates with the saved GPS coordinates and compensate for any drift (displacement).

A fixed point on the ground is needed for calibrating the GPS signal. This is the so-called Reference point 1. When the GPS signal is calibrated, the stored coordinates of the Reference point are compared and matched with the current coordinates.





Left – field with calibrated GPS signal; Right – field with no calibrated GPS signal

If you do not set a reference point nor calibrate the GPS signal each time before starting work, the following will happen:

- The saved GPS coordinates for the field border, tramlines, etc. will differ from the actual values.
- As a result, you may miss treating parts of the field which are outside of the field borders according to the GPS.

In order to ensure maximum precision, you must:

- Set a reference point for each field and its first treatment.
- Calibrate the GPS signal before each treatment.

### Setting Reference point 1

Reference point 1 – a point close to the field. This is used to compare the stored and actual position of the field.

The coordinates of the GPS antenna are crucial when setting the reference point.

#### When should this be set?

A "Reference point 1" should be set in the following cases:

- When you are working a field for the first time.

#### Setting this correctly

When setting the reference point, you will require a fixed point whose position will not alter over time. This can for example be a tree, a landmark or a manhole cover.

This point is required in order to position the tractor in exactly the same position for future GPS signal calibrations.

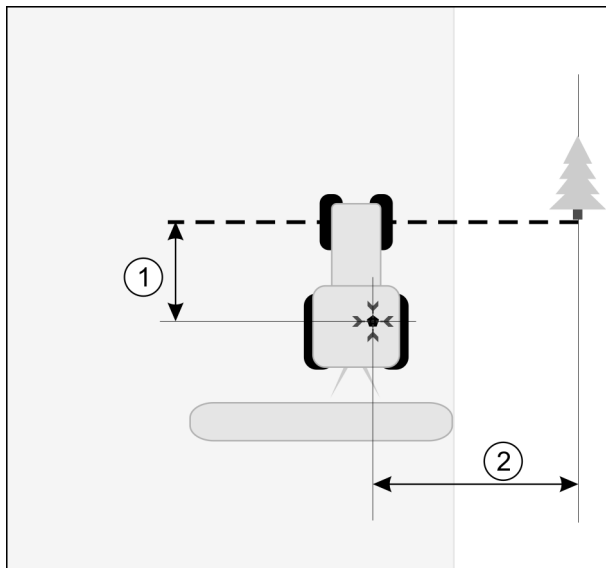
### NOTICE

#### Data loss due to the lack of a reference point

If you are unable to locate the reference point in the future, the recorded data will be unusable.

- Always remember the precise position of the reference point for each field!

The illustration below shows a possible position of the tractor when setting the reference point:




Tractor when setting the reference point


•	GPS antenna on the roof of the tractor cab	✱	Position of the reference point
①	Distance between the GPS antenna and the Y-axis point on the roadside	②	Distance between the GPS antenna and the X-axis point on the roadside
---	Line from a fixed point over the road		


## Procedure

When you are working a field for the first time.

1. Identify a fixed point at the entrance to the field. This can for example be a tree, a landmark or a manhole cover.
2. Draw a line from the fixed point over the road.
3. Position the tractor such that both its front wheels are on the line.
4. Note the distance between the point and the tractor.  
This distance must always be the same for future GPS calibrations.
5. Start new navigation.

6.  – press

7.  – press

8.  – press

⇒ The program determines the current position over a period of 15 seconds, and saves this as "Reference point 1". The reference point must be set precisely at the position of the GPS antenna.

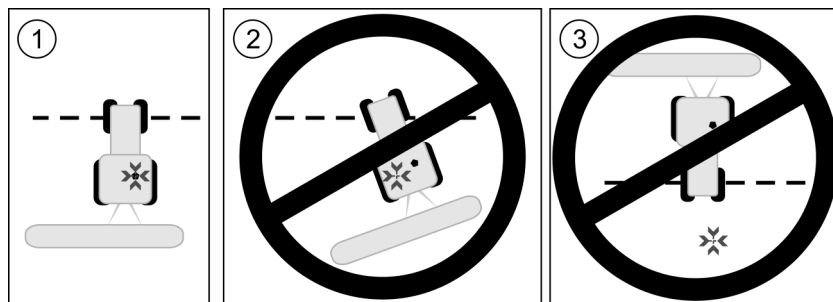
⇒ Any existing reference points and signal calibrations are thus deleted.

⇒ The work screen then displays the reference point icon beneath the machine icon: 

⇒ You have now set "Reference point 1".

## Calibrating GPS signal

When calibrating the GPS signal, the GPS antenna must be in the exact same position as that when setting the Reference point.



Position of the GPS antenna in relation to the reference point when calibrating the GPS signal

	Position of the reference point
	GPS antenna on the roof of the tractor cab

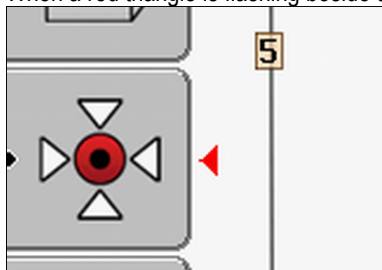
### When should you calibrate?

You will need to calibrate the GPS signal in the following instances:

- Each time before starting work



- When a red triangle is flashing beside the function icon



- When you find that a deviation is shown on the screen even when driving down a lane.

### Procedure

1. Drive to "Reference point 1" at the entrance to the field.
2. Position the tractor such that both its front wheels are on the line.  
The tractor must be positioned at the same angle as when the reference point was set. The distance from the fixed point on the roadside must be the same as when the reference point was set.

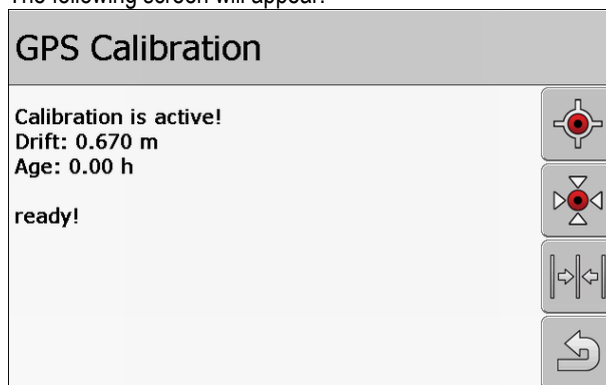
3. - Press.

4. - Press.

5. - Press.

⇒ The program will need 15 seconds to determine the current position. Re-calibrating the reference point overwrites the old calibration.

⇒ The following screen will appear:



6. – back

The GPS calibration screen now displays the following parameters:

- Drift  
Displays the reference point drift since the reference point was set. All field data will be shifted by this value. Drift is re-calculated when the GPS signal is calibrated.
- Age  
How many hours have passed since the GPS signal was last calibrated. Hour segments are displayed in hundredths of a second behind the decimal point. For example: 0.25 h = quarter of an hour = 15 minutes

## 8.4.2 DGPS with correction signal

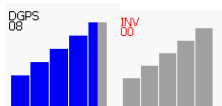
When using an RTK correction signal, you need neither set a reference point nor calibrate the GPS signal. The position of the tractor is continuously corrected by the RTK provider by means of a correction signal.

## 8.4.3 Checking the DGPS signal quality

The quality of the GPS signal can vary widely depending on your geographic position.

You can see the GPS signal quality on the following screens:

- on the start screen
- on the work screen



The DGPS connection indicator displays the following information:

- Bar chart  
Indicates the quality of the connection. The higher the number of blue bars, the better the connection.
- Number of connected satellites
- Correction signal status  
This status should always at least display "DGPS", in order to ensure sufficient accuracy. RTK systems will display either "RTK Fix" or "RTK Float".

SECTION-Control will switch to manual mode in the following cases:

- When the DGPS signal status is "GPS" or lower

- When the number of satellites drops to less than four.
- The bar chart does not display anything

This is shown by an alarm message on the screen.

You should manually activate automatic mode once the GPS connection improves.

## 8.5 Field border

### 8.5.1 Detecting field border

You must detect the field border for each new field.

You can detect this field border while treating the headlands.

Depending on whether or not you are working with an RTK correction signal, you can:

- Possibility 1:  
Applicable in both cases.
  - Travel around the field.
  - Allow the field border to be calculated on the basis of the tramlines which were created during this travel around the field.
  - Treat the interior of the field.
- Possibility 2:  
Recommended with RTK correction signal only.
  - Treat the interior of the field.
  - Travel around the field.
  - Allow the field border to be calculated on the basis of the tramlines which were created during this travel around the field.

This method also works without an RTK correction signal, although you will need to calibrate the GPS signal before treating and calculating the field border. This is because the GPS position drift occurs between the start of work and the calculation of the field border.

#### Procedure 1

If you first want to travel around the field, you should create the field borders as follows:

- You have set and calibrated "Reference point 1". (if you are working with no RTK correction signal)

1. Start a new navigation.
2. Turn on the towed or attached equipment.



3.  - press when this function icon appears on the work screen.

The function key allows you to inform the software that you are going to start to work. If SECTION-Control is activated, or if you have mounted an operating position sensor, this function icon will not appear.

4. Start your route around the field.
  - ⇒ After travelling a few inches, you will see that a green track is being left behind the device bar on the screen. This track marks the area which has been treated.

⇒ If no green track appears, this may be due to the following reasons:

a) You forgot to switch on the tractor-mounted equipment (SECTION-Control)



b) You forgot to press the function key (TRACK-Leader II).

5. Travel around the entire field.

6. End the travel route at the starting point. The travel route must be a closed circuit.



7. – press once you arrive back at the starting point.

⇒ A red line drawn around the field is now shown on the navigation terminal screen. This is the field border.

## Procedure 2

If you first want to treat the field, you should create the field border as follows:

You must have an RTK correction signal available.

1. Start a new navigation.

2. Turn on the towed or attached equipment.



3. - press when this function icon appears on the work screen.

If SECTION-Control is activated, or if you have mounted an operating position sensor, you do not need to press this function key. This is provided for you to inform the software that you are going to start to work.

4. Start the field treatment.

⇒ After travelling a few inches, you will see that a green track is being left behind the device bar on the screen. This track marks the area which has been treated.

⇒ If no green track appears, this may be due to the following reasons:

a) You forgot to switch on the tractor-mounted equipment (SECTION-Control)



b) You forgot to press the function key (TRACK-Leader II).

5. Treat the field.

6. After completing treatment, travel around the field.



7. – press once you arrive back at the starting point.

⇒ A red line drawn around the field is now shown on the navigation terminal screen. This is the field border.

## 8.5.2 Deleting a field border

### Procedure

You can delete the field border as follows:



1. - Keep pressed for a while.

⇒ The field border marked with red line will be deleted.

## 8.6 Creating A-B tramlines

The A-B tramline is the first tramline which you will create. All further tramlines are calculated and designated on the basis of the A-B tramline.

You must create the A-B tramline for each navigation mode.

**When should you create this?**

You can create the A-B tramline any time once you have set the reference point. For example, during the first travel around a field.

### 8.6.1 Creating an A-B tramline in the Parallel and Contour navigation modes

**Procedure**

1. Drive the tractor to the start point of the desired A-B tramline.

2.  or  – define point A.

⇒ Point A is set.

⇒ The Flag A is colored green on the function icon.

3. Drive to the end of the field.

4.  or  – define point B.

⇒ Point B is set.

⇒ The Flag B becomes green on the function icon:



⇒ Points A and B are connected with a line. This line is called the "A-B tramline" and is marked on the terminal screen with two small A and B icons.

In Parallel mode, the A-B tramline is straight.

In Contour mode, the A-B tramline is curved.

⇒ Tramlines are projected, displayed and numbered in both directions on the basis of the current tramline width and the selected navigation mode.

### 8.6.2 Creating a A-B tramline in A Plus navigation mode

**Procedure**

1. Drive the tractor to the start point of the desired A-B tramline.

2.  - Press.

⇒ The data input screen appears.

3. The current direction of the tractor (in degrees) is displayed in the data input screen.

4. Input the desired direction of the A-B tramline in degrees.

⇒ The A-B tramline is created in the defined direction.

## 8.7 Detecting obstacles

If there are obstacles in your field, you can identify their position. Then you will always be warned before a collision would happen.

You can identify obstacles during field processing.

You will be warned of an obstacle in the following cases:


- If reaching the obstacle in 20 seconds or earlier.
- If the distance between the obstacle and the vehicle is smaller than the swathwidth of the agricultural device.

The warning always features two elements:

- Graphic warning in the upper left corner of the screen
  - "Field border"
  - "Obstacle"
- Acoustic signal

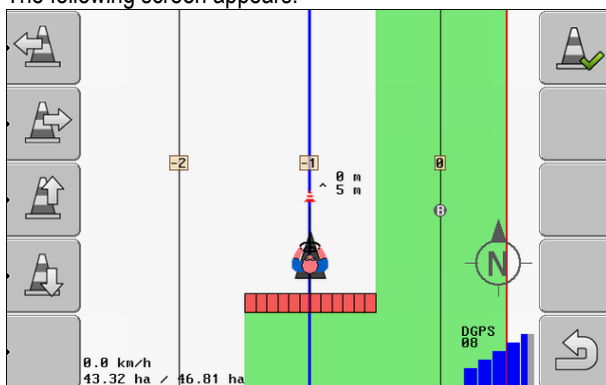
## Procedure

- You have started navigation.

1.  - Press.


2.  - Press.

⇒ The following screen appears:



The screen shows a schematic representation of machine with driver, obstacle and distance between obstacle and GPS Receiver.

3. Set the distance between the obstacles and tractor point by using the arrows.  
As TRACK-Leader II knows the position of the tractor, it can calculate the obstacle position in the field.

4.  - Save the position of the obstacle in the field.

⇒ The obstacle now appears on the screen.

## 8.8 Operation while working

### 8.8.1 Changing working mode of SECTION-Control

If SECTION-Control is activated, you can work in one of two modes:

- Automatic mode
- Manual mode

## Controls





Switch between manual and automatic mode

### Automatic mode

Automatic mode has the following features:

- Automatic section switching during overlaps

### Manual mode

Manual mode has the following features:

- The equipment (e.g. the sprayer) must be manually switched. The results are recorded.

## 8.8.2 Changing the work screen terminal

You have several possibilities of changing what is displayed on the screen.

### Controls

Control element	Function
	Zoom in and zoom out.
	Display the whole field.
	Display vehicle surroundings.
	Activate 3D view.
	Activate 2D view.

## 8.8.3 Shifting tramlines

Use this function if you are indeed on the desired line of travel but the position of the tractor is shown beside the track on the terminal.

You can shift tramlines in parallel and contour modes.

### Procedure

- You have now started a navigation

1. - Press.

2. - Press.

3. - Continue pressing for 3 seconds in order to shift the tramlines to your current position.

⇒ The tramline is then shifted.

### 8.8.4 Deleting tramlines

You can delete tramlines and create new ones at any time.

#### Procedure

1.  or  - Hold pressed for three seconds.

⇒ The tramlines are deleted.

## 8.9 Working on headlands with HEADLAND-Control

The HEADLAND-Control module (also known as Headland Management) enables the headland area to be treated separately from the rest of the field.

#### Advantages

The headland management system has the following advantages:

- You can treat the headland after treating the centre of the field. In this way, no spray residue remains in the machine after treating the headland.
- SECTION-Control switches off the boom sections, which are in the headland area when the field is being treated.
- During work in the headland, trail markers will be displayed for the parallel drive.







#### Restrictions





Headland management has the following restrictions:

- When working with headlands, the TRACK-Leader TOP automatic steering system cannot be used. The driver must steer the vehicle himself, manually.
- Headland Management always assumes the entire swathwidth. If sections are switched off in the sprayer job computer, the entire swathwidth is nevertheless used as a basis.

#### Controls

There is a function icon on the work screen which changes its appearance when pressed. The table below shows the different formats which the icon can have, what these mean, and what happens when you click on the icon.

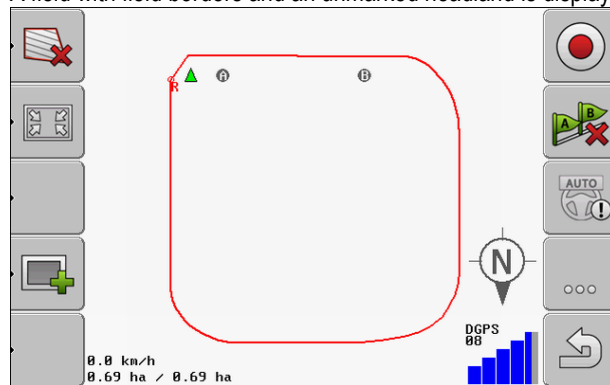
Function icon	Alternative function icon	The software is in this state when the icon appears	This happens after pushing the function key next to the icon
		HEADLAND-Control is deactivated and has never been activated for this field before.  The field border has not been captured yet.	Cannot print.
		HEADLAND-Control is activated.  Appears only when field border is captured.	Headland will be displayed.
		Now you can process the inside of the field.  SECTION-Control only processes the inside of the field. Sections will	Parallel driving in headland will be activated.


Function icon	Alternative function icon	The software is in this state when the icon appears	This happens after pushing the function key next to the icon
		be switched off when changing to headland.  Parallel driving in the inside of the field is activated.	
		Now you can process the headland.	Parallel driving in the inside of the field will be activated.


**Procedure**

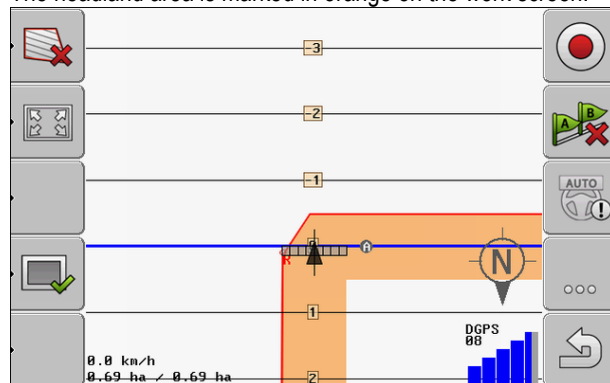
When treating a field once again, you can treat the headland as follows:

1. You will need to load the field data for the field to be treated. [→ 61]
2. Setting the headland width. [→ 46]
3. Start a new navigation.
  - ⇒ A field with field borders and an unmarked headland is displayed.



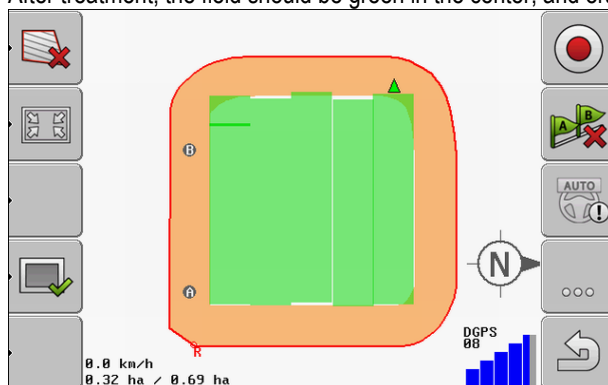
4.  - Press in order to display the headland on the screen.

- ⇒ The function icon  will appear.
- ⇒ The headland area is marked in orange on the work screen.




5. Treat the interior of the field. Use the tramlines to do so.

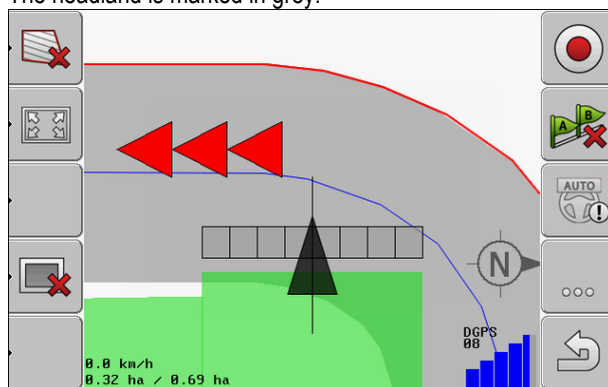
⇒ After treatment, the field should be green in the center, and orange on the outside:



6.  - Press in order to activate headland parallel navigation.

 - displays on the work screen.

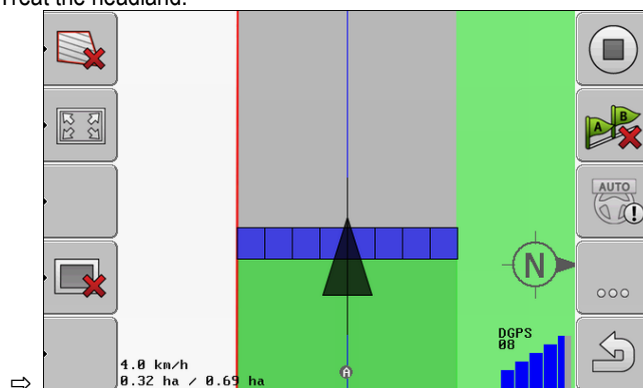
⇒ The headland is marked in grey.



⇒ A tramline appears in the headland.

7. Position the machine at a point in the field from which the field can be exited once treatment is completed.

8. Treat the headland.



9. After completing the treatment of the headland, leave the field and save the field data.

## 9 Using data from USB stick

Field data can be saved for each field on which you work.

Field data consists of the following information:

- Field borders
- Reference point 1
- Tramlines
- Recorded tracks
- Detected obstacles

All field data will be saved together on the USB flash drive.

### 9.1 Saving and loading field data

If you save the field data created during treatment to the USB flash drive, you can use this field data with other ME-applications.

For example with:


- TaskManager
- FIELD-Nav

#### 9.1.1 Saving field data

##### Procedure

1. Switch to the "Storage" screen.



2.  - Press.  
⇒ The data input screen appears.
3. Enter a name under which the field data shall be saved.  
⇒ The data is saved in the "ngstore" folder on the USB flash drive.



#### 9.1.2 Loading field data

Always load the field data before working on an already treated field.

##### Procedure

1. Switch to the "Storage" screen.



2.  - Press.  
⇒ The "Load record" screen will appear.
3.  - Click on the desired field.  
⇒ An overview of the field will appear on the "Storage" screen.

### 9.1.3 Discarding field data

When discarding field data, all information in the temporary memory of the terminal is deleted.

You must delete the field data for a field after treating this in order to be able to work on a new field. If you do not do this, the software will assume that you want to treat the first field once again.

#### NOTICE

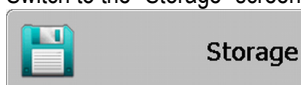
##### Data loss

Once field data is discarded, it cannot be retrieved.

- Save all important field data before discarding this.

#### Procedure

1. Switch to the "Storage" screen:



2.  - Press.

⇒ The field data for the currently loaded field are discarded.

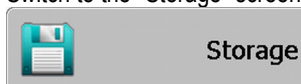
## 9.2 Exporting and importing field data for GIS

If you document your work in GIS format, you can open and process the field data in a GIS program on your PC.

### 9.2.1 Exporting field data for GIS

#### Procedure

1. Switch to the "Storage" screen.



2.  - Press.

⇒ The data input screen appears.

3. Enter a name under which the field data shall be exported.

⇒ The data is saved in the "**NavGuideExport**" folder on the USB flash drive.

### 9.2.2 Importing field data from GIS

#### Types of GIS field data

- Background areas
- Obstacle lines
- Obstacles

#### Procedure

- You have created the folder "**NavGuideGisImport**" on your USB stick.
- All data you want to import are stored on the USB stick in folder "**NavGuideGisImport**". The folder must not contain any sub-folders.
- The data to be imported are in format WGS84.

1. Switch to the "Storage" screen.



2.  - Press.

⇒ The following screen will appear:

Background data	
Type	actual
Background areas	-
Obstacle lines	-
Obstacles	-
Prescription maps	-

3. Click on the required type of GIS field data.

⇒ The following screen appears:

Choose File	
Field 1.shp	Areas

In the left column you can see the denotation of the file with the field data. The right column shows the type of GIS field data. Names for the data depend on you and the GIS system you are using.

4. Mark the line with required data.



5.  - Press.

⇒ Background data will be loaded.

## 9.3 Reorganizing data

The aim of reorganizing your data is to speed up the operation of the terminal.

The data saved on the USB flash drive are sorted, so that the terminal can access this data more rapidly.

### Procedure

1. Switch to the "Storage" screen.




2.  - Press.

⇒ The "Load record" screen will appear.

3.  - Press.

⇒ The "Data administration" screen will appear.

4.  - Click on "Data rearrangement".






5. The following message will appear: "Ready".

6.  - Confirm.

## 9.4 Viewing recorded tracks

You can view and check the recorded tracks to see if you have left anything out.

### Controls



Function icon	Meaning
 + 	Move the cursor left and right
 + 	Move the cursor up and down
	Zoom


### Procedure

1. Switch to the "Storage" screen

2. Load the desired field.

3.  - Zoom.

4.  or  - Continue pressing the function key.

5.  - Turn the rotary knob.  
⇒ The selection is then shifted.

## 9.5 Deleting fields from the USB flash drive

You can delete entire fields with all related field data from the USB stick.

### Procedure

You can delete a field as follows:



1. Change to "Storage" screen.

2.  - Press.

⇒ The "Load Record" screen appears.

3.  - Mark the file with the field to be deleted.








4.  - Delete marked file.  
⇒ The following message will appear: "Really delete this record?"
5.  - Confirm.  
⇒ The name of the file with the field data will disappear from the table.

## 9.6 Deleting recorded tracks

You can delete the drives for all fields you have saved. Other field data [→ 61] will not be deleted.

You can perform this step at the end of the season, for example.

### Procedure

1. Change to "Storage" screen.
2.  - Press.  
⇒ The "Load Record" screen appears.
3.  - Mark the desired field.
4.  - Press.
5. The "data administration" screen appears.
6.  - Click on "Delete recorded tracks".  
⇒ The following message will appear: "All recorded tracks will be deleted! Continue?"
7.  - Confirm.

## 10 Editing prescription maps with VARIABLE-RATE Control

A prescription map is a detailed map of a field. In this map the field is split up into areas. The prescription map contains information on how intense the work in each area shall be.

### Mode of operation

When the prescription map has been loaded, the software checks via GPS coordinates of the vehicle what spread rates are needed according to the prescription map and transfers this information to the ISOBUS job computer.

### 10.1 Basic processes

To be able to work with prescription maps in \*.shp format, you need to:

1. Set up a prescription map on the PC.
2. Copy the prescription map to the USB stick.
3. Import the corresponding prescription map by using TRACK-Leader.
4. Select format for the prescription map.
5. Adjust the prescription map to current needs.

In the chapters below you will learn how to take these steps.

### 10.2 Creating prescription maps

You can create a prescription map in the Farm Management Information System or by using other PC programs.

Each prescription map must be compiled from the following files:

- Shp
- Dbf
- Shx

### 10.3 Copying prescription maps to the USB stick



Copy all prescription maps to folder "applicationmaps" on the USB stick.

### 10.4 Importing prescription maps

You can import a prescription map created on the PC from the USB stick.

Import the prescription map before starting your work.

#### Procedure

- You have created the folder "**applicationmaps**" on your USB stick.
  - All prescription maps you want to import are stored on the USB stick in folder "applicationmaps".
1. Change to the "**Storage**" screen.
- 
2.  - Press.  
⇒ The "Background data" screen appears.
  3. Click on line "Prescription maps".

⇒ The "Prescription maps" screen appears.



4. - Press.

⇒ The "Choose prescription map" screen appears.

5. Click on the line with the name of the prescription map you want to import.

⇒ TRACK-leader will check whether it knows the file format.

⇒ Should the format be unknown, you have to create a new format. read how to do so in the following chapter: Creating new prescription map formats [→ 67]

⇒ When the format is recognized, the following screen appears: "Choose format".

⇒ The format selected by the software appears in line "Format".

6. Press "OK" to load the prescription map with this format.

7. Press "New" to load the prescription map with a new format.

## 10.5 Prescription map format

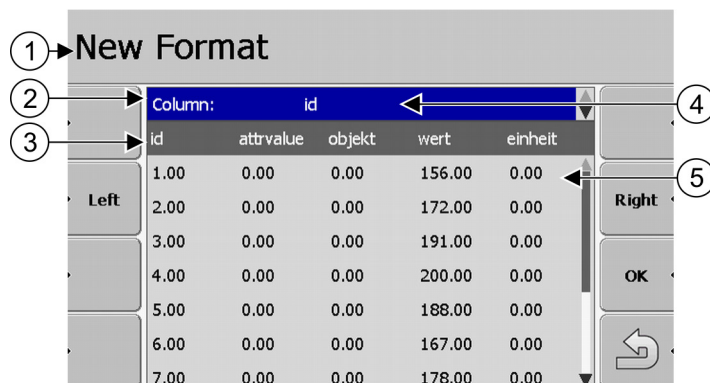
Each prescription map is structured like a table.

The "format" function tells the TRACK-Leader software in which column of the prescription map the values, used later as the "Dosis" for the work, are located.

### 10.5.1 Creating new prescription map formats

You need to create a new format when importing a prescription map with a structure not recognized by the software.


The formats will be stored directly in internal storage of the display. You have to create them separately for each display.



Screen "New Format"


①	Denotation of the screen	④	Denotation of selected column
②	Box for column selection	⑤	Data in the table Data come from the shp file
③	Table headlines Column headlines are defined when creating the prescription map with the PC software.		

### Controls

Control element	Function
	Select column name
Left	Scroll to the left if the table is bigger than the screen.
Right	Scroll to the right if the table is bigger than the screen.
OK	Confirm your choice

### Procedure


This is how you create a new format for the prescription map.

- You have chosen a prescription map.
- The "Choose format" screen has been called up.
- 1. Press "New".
  - ⇒ The following screen will appear: "New Format"
- 2.  - In the "Column" line choose the denotation of the column containing required values.
- 3. Press "OK" to confirm the choice.
  - ⇒ The following screen will appear: "Format name"
- 4. Enter the name of the new format.
  - ⇒ The following screen will appear: "Unit"
- 5. Choose the unit containing the values in the prescription map.
- 6. Press "OK".
  - ⇒ The following screen will appear: "Choose format".
  - ⇒ The name of the new format appears in line "Format".
- 7. Press "OK".
  - ⇒ The prescription map will be loaded. This process can take a bit longer if the prescription map is large.
  - ⇒ The following screen will appear: "Prescription maps"

### 10.5.2 Selecting from prescription map formats

#### Procedure

This is how you select an available prescription map format:

- You have chosen a prescription map.
- The "Choose format" screen has been called up.
- 1. Press "Format".
  - ⇒ The "Format" line will be marked in blue.
- 2.  - Select required format.
- 3. Press "OK" to confirm the choice.
  - ⇒ The prescription map will be loaded.
  - ⇒ The "Prescription maps" screen appears.

### 10.5.3 Deleting prescription map formats

#### Procedure

You can delete a format as follows:


The "Prescription maps" screen has been called up.

1. Press "Format".


⇒ The "Formats" screen appears.

2. Press "Format".

⇒ The line with the format name will be marked in blue.

3.  - Select the format you want to delete.

4.  - Confirm your choice.

5.  - Press to delete selected format.

⇒ The following message will appear: "Do you really want to delete this format?"

6.  - Confirm.

⇒ The format will be deleted.

### 10.6 Adjusting prescription maps to current needs

After importing the prescription map, you can change the following:

- All values by certain percentage points.
- Selected values by an absolute number.

#### Procedure

This is how you change all values at once:

You have chosen a prescription map.

The "Prescription maps" screen has been called up.

You can see a prescription map on the screen.

1. Press "All %" to change all doses.

⇒ A screen for data input appears.

2. Enter by how many percentage points all doses shall be changed.

3. Press "OK" to confirm the input.

⇒ The "Prescription maps" screen appears.

⇒ In the "Dosis" column all values will be adjusted by the percentage points entered.


#### Procedure

This is how you change a selected value:


You have chosen a prescription map.

The "Prescription maps" screen has been called up.



You can see a prescription map on the screen.

1.  - Turn the rotary knob.

⇒ In the "Dosis" column a blue frame marking a cell appears.













2.  - Mark the dosis to be changed.
3. Press "Dosis +-".  
⇒ A screen for data input appears.
4. Input a new value.
5. Press "OK" to confirm the input.  
⇒ The "Prescription maps" screen appears.  
⇒ The new value appears in the cell you have changed.

## 11 TRACK-Leader TOP automatic steering

	 <b>WARNING</b>
	<ul style="list-style-type: none"> <li>◦ Read the enclosed "Ultra Guidance PSR ISO" directions for use before beginning to use the system. Pay particular attention to the information in the Chapter "Safety".</li> <li>◦ Proceed with extreme care, particularly when using the automatic steering!</li> <li>◦ Disable the automatic steering whenever anyone comes within 55 yards of the machine while it is operating.</li> </ul>

### Controls

All function icons that you need for automatic steering control are displayed directly on the screen.



Function icon	Alternative function icon	Description
		Automatic steering TRACK-Leader TOP is deactivated or not available at all.
		The steering job computer is mounted and configured, but an error has occurred. Read the error message in the steering job computer application.
		Activate automatic steering. Automatic steering can be activated, but is not active.
		Deactivate automatic steering. Automatic steering is active.
		Steer the vehicle to the left. The function key does not work when TRACK-Leader TOP is deactivated.
		Steer the vehicle to the right. The function key does not work when TRACK-Leader TOP is deactivated.

### 11.1 Driver tasks

The driver must perform the following tasks:

- The driver must pay attention to safety. The automatic steering system is blind. It cannot tell if anyone is approaching the machine. It cannot stop or take evasive action.
- The driver must brake and accelerate.
- The driver must perform turning.

## 11.2 Activating and deactivating automatic steering

	 <b>WARNING</b>
	<p><b>Risk of traffic accident</b></p> <p>When the automatic steering is enabled, the vehicle may veer from the driving route and cause an accident. This may cause human injury, or even fatalities.</p> <ul style="list-style-type: none"> <li>◦ Disable the automatic steering before travelling on public roads.</li> <li>◦ Move the steering motor away from the steering wheel.</li> </ul>

### Procedure

You can activate automatic steering as follows:

- You must first configure the steering job computer and TRACK-Leader TOP.
- You must first create the A-B tramline.
- You must have positioned the vehicle on a line of travel, and enabled a tramline.

- The work screen displays the function icon



1. Position the steering motor with friction wheel on the steering wheel.

2.  - Press.

⇒ The function icon is replaced with the following function icon:

⇒ The automatic steering is enabled.



3. When under way in the vehicle, the steering motor controls the vehicle in such a way that it proceeds along the active tramline.

### Procedure

There are several ways of disabling the automatic steering:

1. Move the steering wheel.

or:



- Press.

⇒ The automatic steering will be disabled.

⇒ The function icon  is replaced with the following function icon:



## 11.3 Driving parallel to the tramline

The automatic steering drives the vehicle along the active tramline.

You can make the vehicle drive parallel to the active tramline.



### Procedure

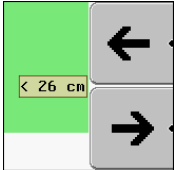
You drive the vehicle parallel to the active tramline as follows:

- The work screen displays the function icon





1. Press  or  to make the vehicle drive parallel to the active tramline.
  - ⇒ Information appears beside the function icon symbol indicating the distance and direction in which the line of travel has been shifted:
 







    - ⇒ The steering motor controls the steering wheel.
2. The vehicle will drive parallel to the tramline until another tramline is activated.

## 11.4 Turning

When turning, the driver must take control of the steering and steer himself.

### Procedure

You can make a turn as follows when automatic steering is enabled:

- The work screen displays the function icon: . The automatic steering is enabled.
1. Take hold of the steering wheel and perform the turning yourself.
    - ⇒ The automatic steering is disabled automatically as soon as the steering wheel is moved.
    - ⇒ The function icon  is replaced with the following function icon: .
  2. Turning.
    - ⇒ The next tramline is then activated if the angle between itself and the vehicle is smaller than the set "Swinging angle" parameter.
  3.  - Enable steering once the next tramline is enabled.

## 12 Cooperation with other applications

### 12.1 Cooperation with application TaskManager

You can use TRACK-Leader together with the TaskManager application.

#### Advantages

- You need not load or import any field data with TRACK-Leader. When starting an order in TaskManager, then all field data will be forwarded directly to TRACK-Leader.
- You can work by using prescription maps integrated in an order.

#### Important

To be able to use both programs, please note:

1. Activate the "Connection with TM" parameter.
2. Always start an order in the TaskManager application when working with TRACK-Leader.

#### Deactivating TaskManager

If you do not want to use TaskManager:

1. Stop the SC mode in TaskManager. Deactivate the "Connection with TM" parameter.

### 12.2 Cooperation with job computers

When an ISOBUS job computer is connected to the display, you can use all TRACK-Leader apps.

In this case, TRACK-Leader takes all parameters of connected agricultural device from the ISOBUS job computer.

For example:

- Swathwidth
- No. of sections
- Geometry of agricultural device

The job computer receives this information from TRACK-Leader:

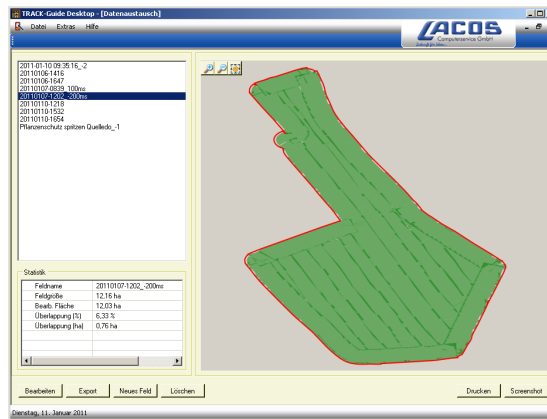
- Commands to switch on/off sections (SECTION-Control)
- Spread rates (VRC)

### 12.3 Cooperation with TRACK-Guide Desktop

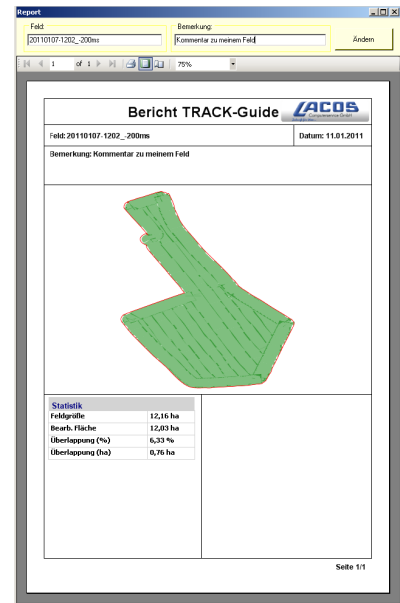
TRACK-Guide Desktop is a free program for PCs.

This allows you to:

- View work results
- Print reports for your customers



Program window



Report

You can find TRACK-Guide Desktop in the "Download" section of the website below: [www.lacos.de](http://www.lacos.de)

## 13 Procedure for dealing with error messages

Error message text	Possible cause	How to fix the problem
Caution! The memory could not be initialized. If the problem still persists after a restart, please contact the service.	The database could not be created on the USB flash drive.	Restart the terminal.
Current profile not removable!	An attempt was made to delete the currently selected machine profile.	Select another machine profile and then delete the desired machine profile.
An error has occurred while reorganizing the memory.	The USB flash drive was removed during reorganizing.	Re-insert the USB flash drive and re-start the reorganizing
	The USB flash drive is full.	Delete unnecessary data from the USB flash drive and try again.
	The USB flash drive is faulty.	Request a new USB flash drive from the manufacturer.
Could not find DGPS configuration file!	The internal file containing the DGPS settings could not be found.	Contact our Service team in order to reinstall the software.
Test phase run off! Please inform your dealer.	Test phase run off!	Request a license. Unlock the software.
No USB flash drive is inserted!		Insert the USB flash drive.
Export failed!	The USB flash drive was removed before or during the export.	Re-insert the USB flash drive and re-start the export.
	Writing is not allowed on the USB flash drive.	Disable write protection on the USB flash drive.
	The USB flash drive is full.	Delete unnecessary data from the USB flash drive and try again.
Error!		Contact the Customer service.
GPS is not working!	The serial connection to the GPS antenna has been interrupted.	Check and re-connect the cable connections to the GPS antenna.
	The position can no longer be determined.	
GPS signal too weak!	The GPS signal quality is too weak, most likely due to obstructions.	Check the mounting of the GPS receiver and your current position. The receiver must be in open view to the sky.
No DGPS available!	No DGPS is available due to signal obstruction.	Check the mounting of the GPS receiver and your current position. The receiver must be in open view to the sky.

Error message text	Possible cause	How to fix the problem
	No DGPS is available due to a failure of the correction data service, e.g. EGNOS.	Check the general availability of the service. Check and set the correct EGNOS correction satellites.
No compatible format found for this application map. Please create a new format.	No suitable format could be found for the application map content. No compatible format has been created.	The major formats have been provided. Other formats can be incorporated by the users themselves.
No profile available!	No machine profile is available!	Create a new machine profile.
Could not read DGPS configuration from GPS receiver!	The serial connection to the GPS antenna has been interrupted.	Check and re-connect the cable connections to the GPS antenna.
Could not read e-Dif configuration from GPS receiver!	The serial connection to the GPS antenna has been interrupted.	Check and re-connect the cable connections to the GPS antenna.
Settings could not be read from the Tilt module!	The serial connection to the GPS TILT module tilt sensor has been interrupted.	Check and re-connect the cable connections.
Backup failed!	The USB flash drive was removed before or during the save.	Re-insert the USB flash drive and re-start the save process.
	Writing is not allowed on the USB flash drive.	Disable write protection on the USB flash drive.
	The USB flash drive is full.	Delete unnecessary data from the USB flash drive and try again.
Invalid status!		Contact the Customer service.