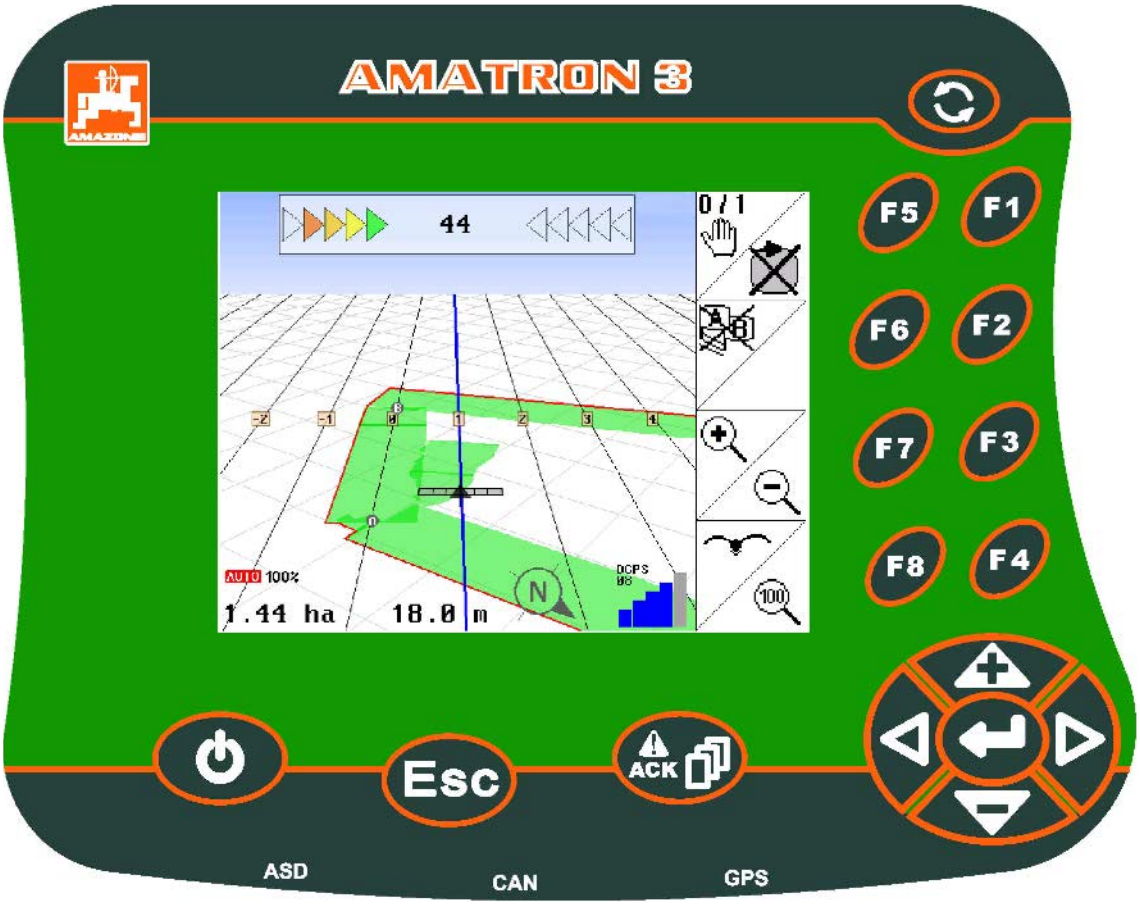
Operating Manual

AMAZONE

AMATRON 3

In-cab terminal



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Printed in Germany

Please read this operating manual before first commissioning. Keep it in a safe place for future use.

en

Reading the instruction

Manual and following it should seem to be inconvenient and superfluous as it is not enough to hear from others and to realize that a machine is good, to buy it and to believe that now everything should work by itself. The person in question would not only harm himself but also make the mistake of blaming the machine for possible failures instead of himself. In order to ensure success one should enter the mind of a thing, make himself familiar with every part of the machine and get acquainted with how it's handled. Only in this way could you be satisfied both with the machine and with yourself. This goal is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Enter the machine identification data here. You will find the identification data on the type plate.

Machine identification number:
(ten-digit)

Type: **AMATRON 3**

Manufacturer's address

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

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Spare part orders

Spare parts lists are freely accessible in the spare parts portal at www.amazone.de.

Please send orders to your AMAZONE dealer.

Formalities of the operating manual

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Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER GmbH & Co. KG. We thank you for your confidence in our products.

On receiving the machine, check to see if it was damaged during transport or if parts are missing. Using the delivery note, check that the machine was delivered in full including the ordered special equipment. Damage can only be rectified if problems are signalled immediately!

Before first commissioning, read and understand this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

Please ensure that all the machine operators have read this operating manual before commissioning the machine.

Should you have any questions or problems, please consult this operating manual or contact your local service partner.

Regular maintenance and timely replacement of worn or damaged parts increases the lifespan of your machine.

User evaluation

Dear Reader,

We update our operating manuals regularly. Your suggestions for improvement help us to create ever more user-friendly manuals. Send us your suggestions by fax.

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1 User Information

The User Information section supplies information on use of the operating manual.

1.1 Purpose of the document

This operating manual

- Describes the operation and maintenance of the machine.
- Provides important information on safe and efficient handling of the machine.
- Is a component part of the machine and should always be kept with the machine or the traction vehicle.
- Keep it in a safe place for future use.

1.2 Locations in the operating manual

All the directions specified in the operating manual are always seen from the direction of travel.

1.3 Diagrams used

Handling instructions and reactions

Activities to be carried out by the user are given as numbered instructions. Always keep to the order of the handling instructions. The reaction to the handling instructions is given by an arrow.

Example:

1. Handling instruction 1

→ Reaction of the machine to handling instruction 1

2. Handling instruction 2

Lists

Lists without an essential order are shown as a list with bullets.

Example:

- Point 1
- Point 2

Number items in diagrams

Numbers in round brackets refer to the item numbers in the diagrams.

2 General Safety Instructions

Knowledge of the basic safety information and safety regulations is a basic requirement for safe handling and fault-free machine operation.

The operation manual

- Must always be kept at the place at which the machine is operated.
- Must always be easily accessible for the user and maintenance personnel.

2.1 Representation of safety symbols

Safety instructions are indicated by the triangular safety symbol and the highlighted signal word. The signal word (DANGER, WARNING, CAUTION) describes the gravity of the risk and has the following significance:

DANGER

Indicates an immediate high risk which will result in death or serious physical injury (loss of body parts or long term damage) if not avoided.

If the instructions are not followed, then this will result in immediate death or serious physical injury.

WARNING

Indicates a medium risk, which could result in death or (serious) physical injury if not avoided.

If the instructions are not followed, then this may result in death or serious physical injury.

CAUTION

Indicates a low risk which could incur minor or medium level physical injury or damage to property if not avoided.

IMPORTANT

Indicates an obligation to special behaviour or an activity required for proper machine handling.

Non-compliance with these instructions can cause faults on the machine or in the environment.

NOTE

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your machine to the optimum.

2.2 Safety precautions for the GPS application

WARNING

In automatic mode, the spread fan of the fertiliser spreader poses a danger to persons in the working area.

The danger may arise through the automatic opening of the shutter.

3 Installation instructions

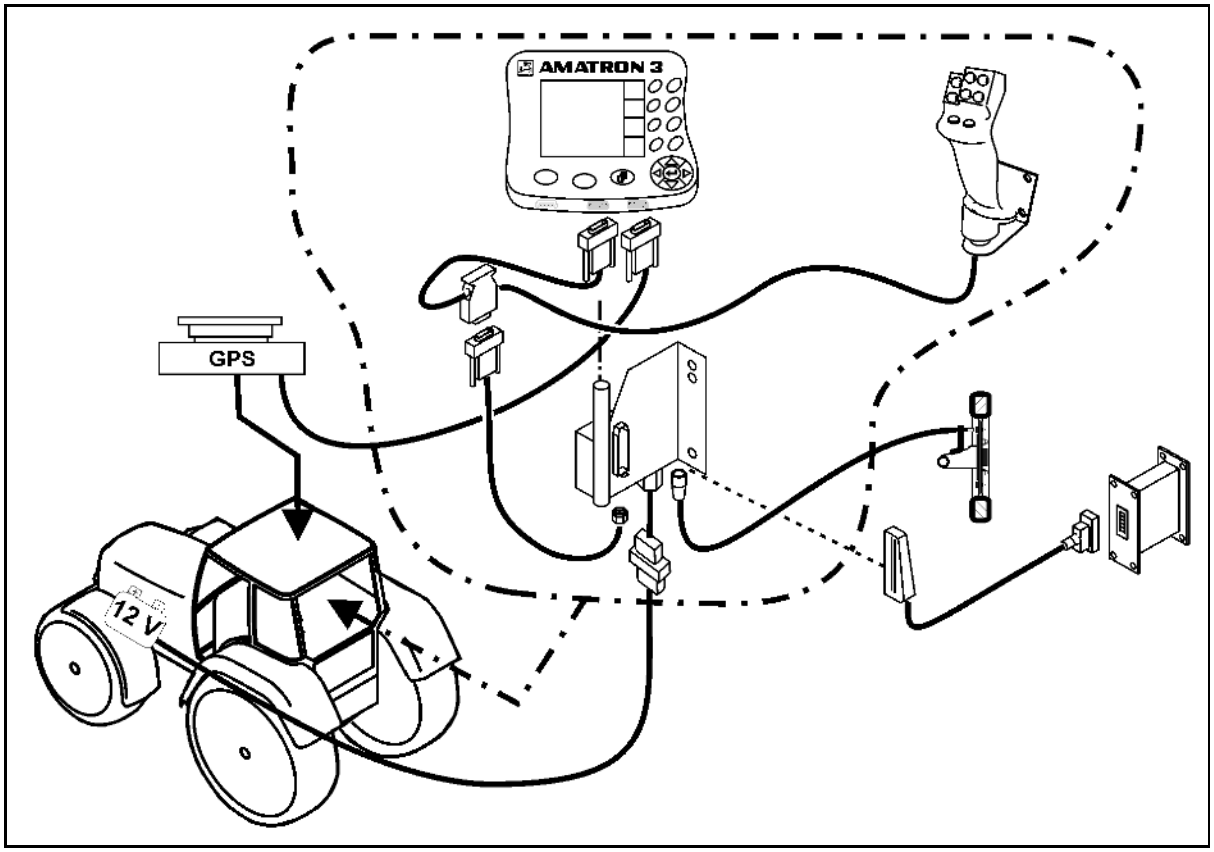
The software is configured to have the GPS antenna mounted on the tractor; see page **77**.

- The AMATRON 3 can be connected with the tractor basic equipment or with the ISOBUS wiring.
- The tractor's basic equipment (console with distributor) must be installed to the right of the driver in the cab, within visual range and easy reach, so that it is vibration-free and electrically conductive.

→ Remove the paint from the mounting points to prevent electrostatic charging.

- The distance from the radio unit or aerial must be at least 1 m.

3.1 AMABUS



3.2 ISOBUS / ISOBUS Light

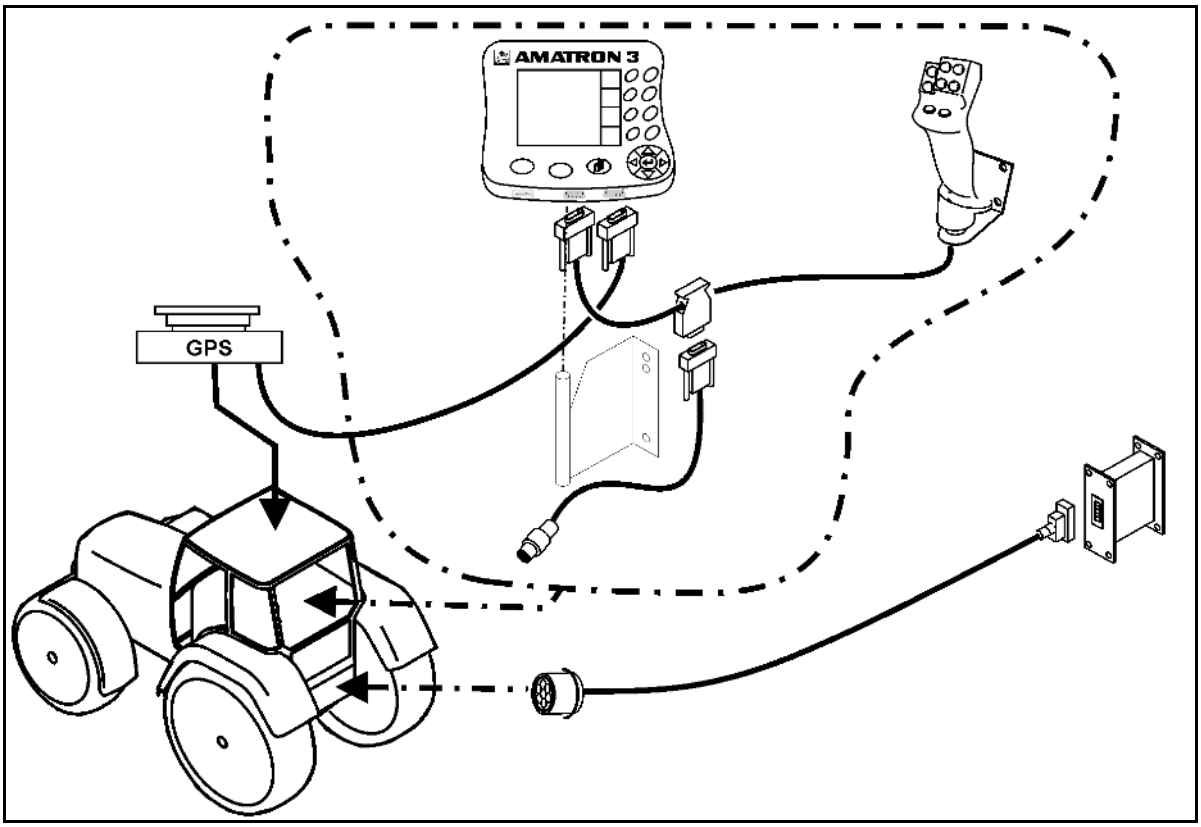
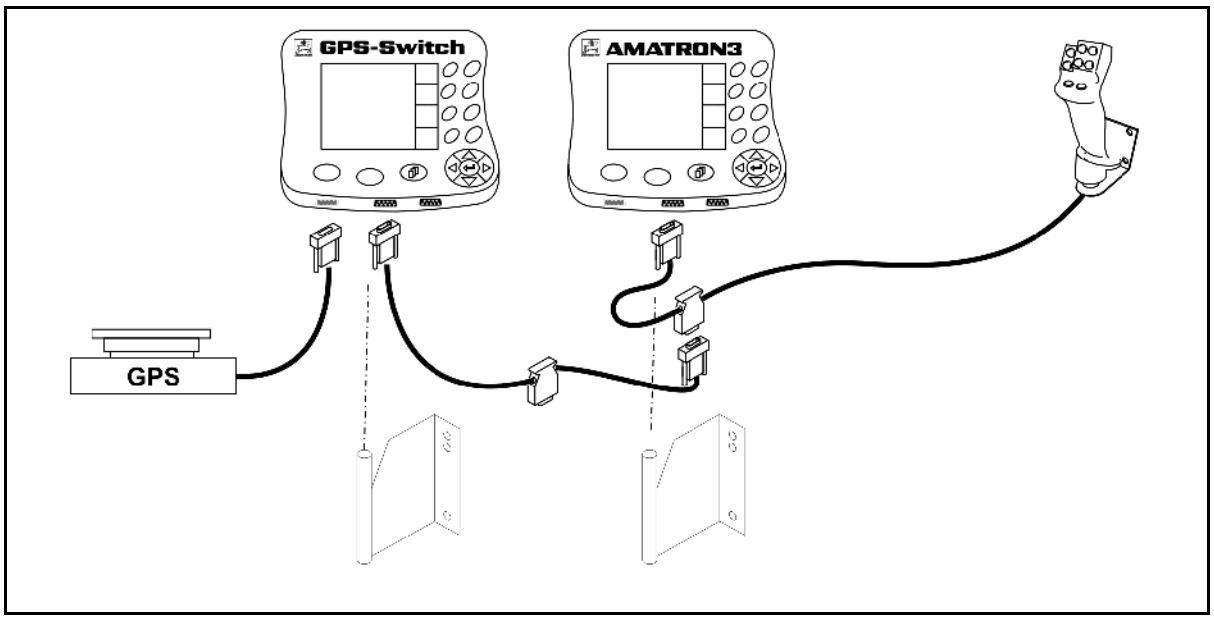


Fig. 1

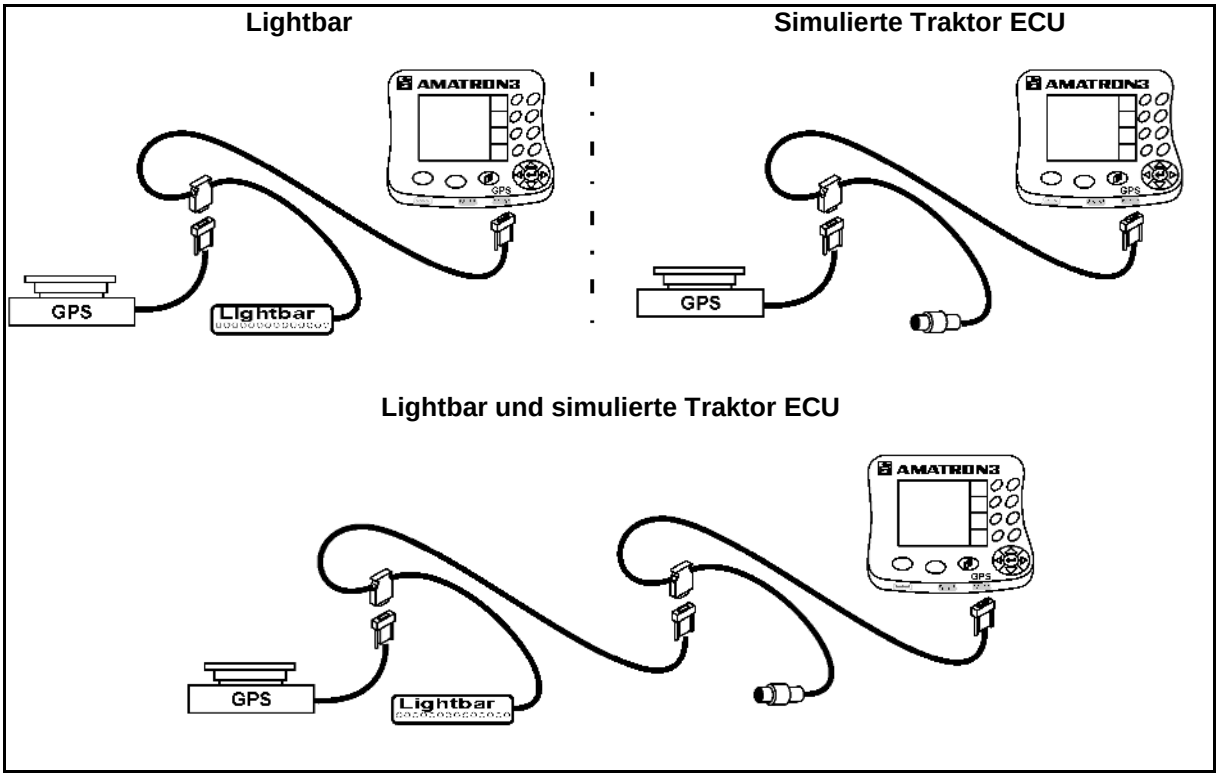
For machines that are connected to an ISOBUS tractor using the ISOBUS light cabling:

- the ISOBUS function of the tractor terminal must be deactivated.

3.3 Connecting the second terminal



3.4 Cabling of external light bars and simulated tractor ECU



4 Product description

The AMATRON 3 can be applied in two operating modes, depending on the machine equipment:

- As AMAZONE terminal for AMAZONE machines (AMABUS).
- As ISOBUS terminal for all machines with ISOBUS equipment (ISOBUS certification according to AEF 2013).

When switching on the AMATRON 3, you can select between the operating modes ISOBUS or AMABUS.

The default start application can also be set in the menu terminal setup.

4.1 Applications on the AMATRON 3

Applications on every AMATRON 3:

- Operation of the implements (ISOBUS or AMABUS)
- Terminal setup

Optional applications:

- GPS switch
- GPS track
- GPS-Maps
- GPS headland
- TaskController (job management)

4.2 Implement control application

See the separate operating manual for operation and monitoring of the AMAZONE implement.

4.3 Terminal Setup application

In the Terminal Setup you can make settings directly affecting the terminal, see page 25.

4.4 TaskController application

The TaskController manages jobs for ISOBUS machines, see page 36.

A 50 hour test version has been released.

4.5 GPS application

A GPS receiver is required for GPS application.

4.5.1 GPS switch (option)

When using agricultural machines, dosing errors cannot be prevented entirely when switching the machine on or off on the headlands and when driving across field edges.

Overlaps and other possible consequences can cause damage to the plants, increased runoff in surface water bodies or lodge grain. These disadvantages can be prevented using a GPS switch connected to a GPS receiver.

The GPS-Switch enables positionally accurate switching on the headland, on the field edge or when driving around obstacles.

Boom, part width section or spreading characteristics of the respective machine are taken into account.

When driving around the field for the first time, the field borders are recorded. Based on these borders, the GPS switch determines, depending on the machine parameters, the position in the field at which the device is switched on or off, or whether the working width has to be changed.

A 50 hour test version has been released.

4.5.2 GPS track (option)

GPS track is used for track guidance on the field.

The application is integrated into the GPS switch, see page 86.

A 50 hour test version has been released.

4.5.3 GPS Headland

To generate a virtual headland.

The application is integrated into the GPS switch, see page 86.

A 50 hour test version has been released.

4.5.4 GPS-Maps importing application maps (optional)

Fields for which the application maps are imported, are processed according to the stored set values. The set values can be edited after import.

The application is integrated into the GPS switch, see page 86.

A 50 hour test version has been released.

4.6 Software version

This operating manual is valid from software version:

AMATRON 3 SW-Version	V 01.06.00

The software version can be displayed in the Terminal Diagnosis sub-menu of the Terminal Setup.

4.7 USB interface

The GPS-Switch has a USB interface for data exchange with a USB memory stick.

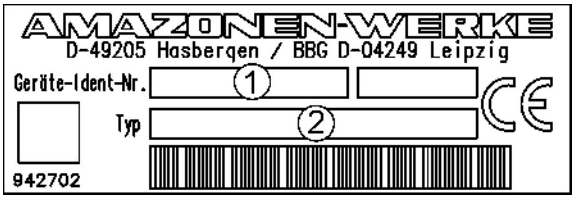
4.8 Rating plate and CE marking

The following diagrams show the positions of the rating plate and the CE marking.

The rating plate shows:

(1) Machine ID no.:

(2) Type



5 Operation of the AMATRON 3 terminal

The AMATRON 3 always starts in the operation mode which was started last.

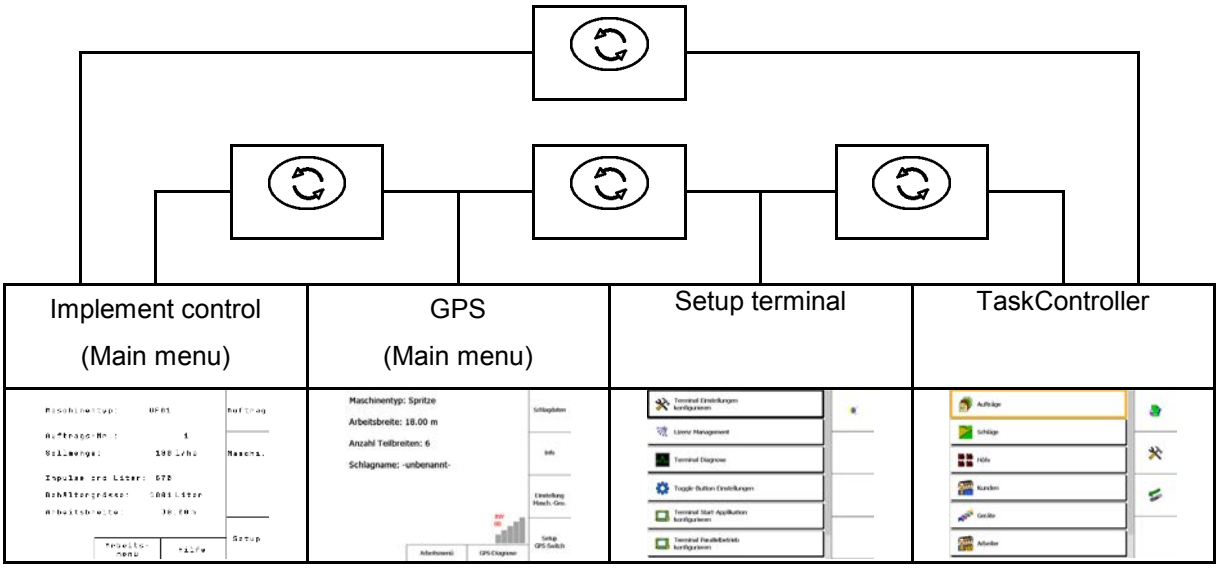
Alternatively

- the operating mode can be selected after switching the machine on.
  - o ISO-VT (ISOBUS)
  - o AMAZONE terminal (AMABUS)
- The AMATRON 3 starts in the operation mode that has been selected in the Terminal Setup by default.

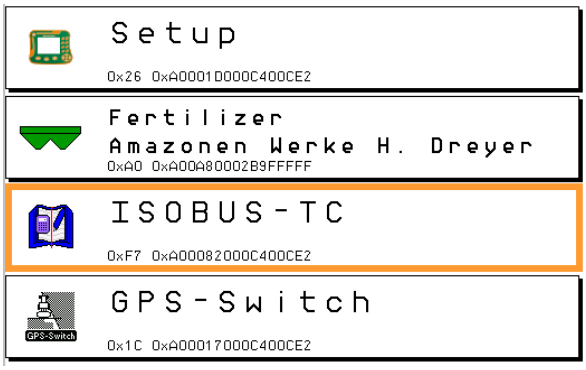
5.1.1 Selection of the AMATRON 3 application

Selection of the AMATRON 3 application

- Implement control application
- GPS switch application
- Setup terminal
- TaskController



The menu for manually selecting an application appears after pressing the button for three seconds.



5.2 Keys and function fields

The functions indicated at the right display edge by a function field are controlled via the two rows of keys to the right of the display.

AMABUS

- Quadratic function field (A)

→ Keys (F1 – F4)

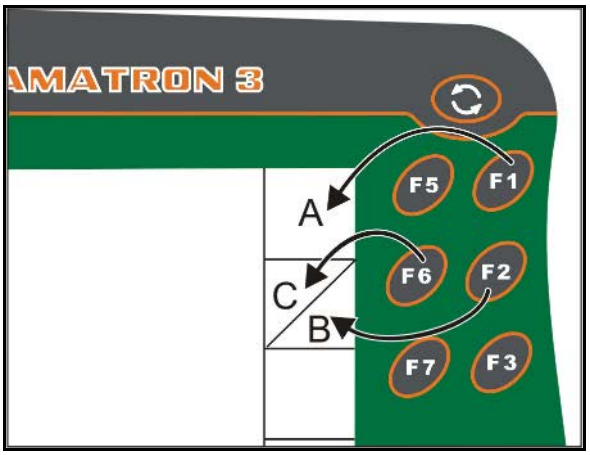
Function field divided diagonally:

- function field bottom right (B)

→ keys (F1 – F4)

- function field top left (C)

→ keys (F5 - F8)



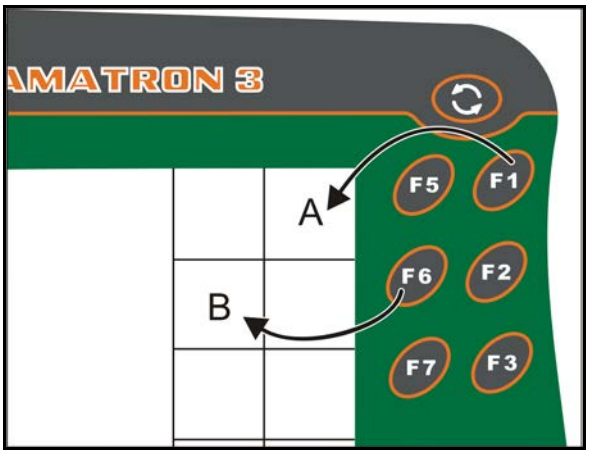
ISOBUS

- Quadratic function field (A)

→ Keys (F1 – F4)

- Quadratic function field (B)

→ Keys (F5 – F8)



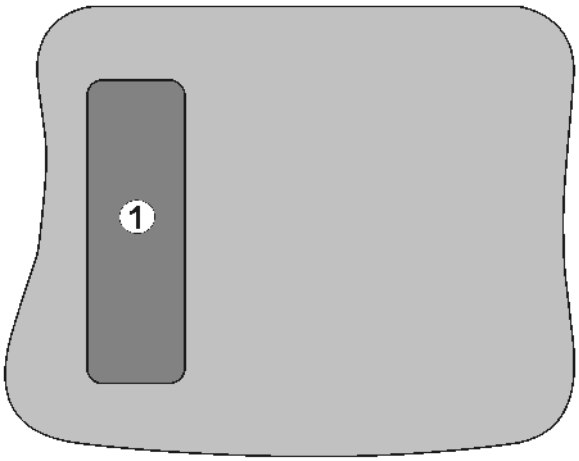
	On / Off (Always switch off the AMATRON 3 when driving on public roads).
	Switching between the applications
	• Return to last menu • Switch between work menu - main menu • Cancel entry • To work menu (press key at least 1 second)
	• Scroll to other menu pages • GPS diagnosis • Multi-function stick learning menu • Confirmation of ISOBUS alarm masks (according to application)
	• Move cursor left in display
	• Move cursor right in display
	• Take over selected numbers and letters • Confirm critical alarm • 100% quantity in work menu
	• Move cursor up in display • Increase specified quantity during work by percentage application rate increase.
	• Move cursor down in display • Reduce specified quantity during work by percentage application rate decrease.

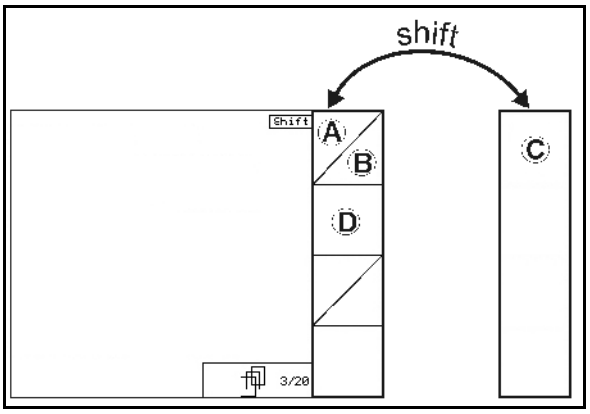
5.2.1 Shift key

The Shift key is required in the Work menu of the implement control.

Active in work menu and lot data menu.

- The shift key is located on the back of the unit (1).
- If the Shift key is active, this is indicated on the display.
- When the Shift key is actuated, further function fields appear and the assignment of the function keys is altered accordingly.





5.3 Entries on the terminal

For operation of the terminal, the function fields appear in this operating manual in order to make clear that the key for the respective function field must be pressed.

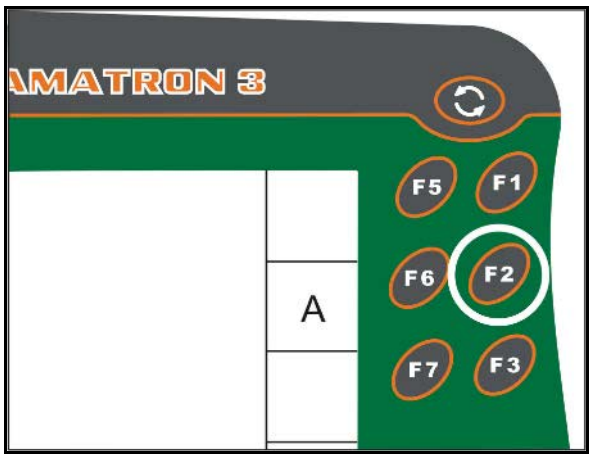


Fig. 2

Example:

- Function field A:

Description in the operating manual:

A Save the field.

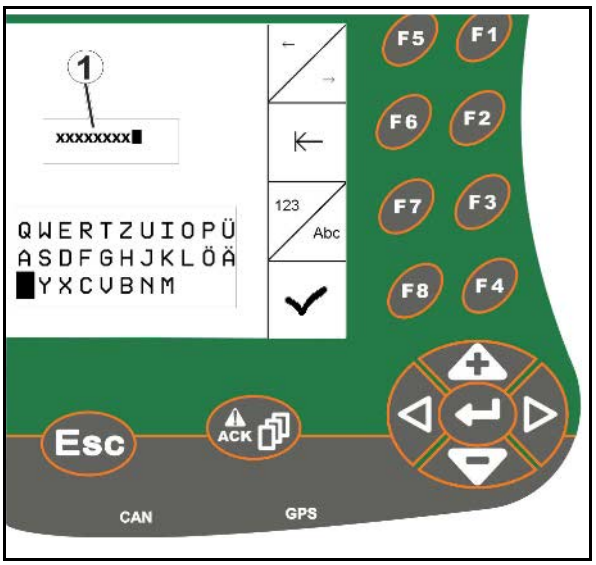
Action:

The operator presses the key assigned to function field **A** in order to save the field.

5.3.1 Entering text

If it is necessary to enter texts or numbers on the terminal, the input menu appears.

In the lower part of the display, a selection field appears with letters or numbers which can be used to compose the input line (1).



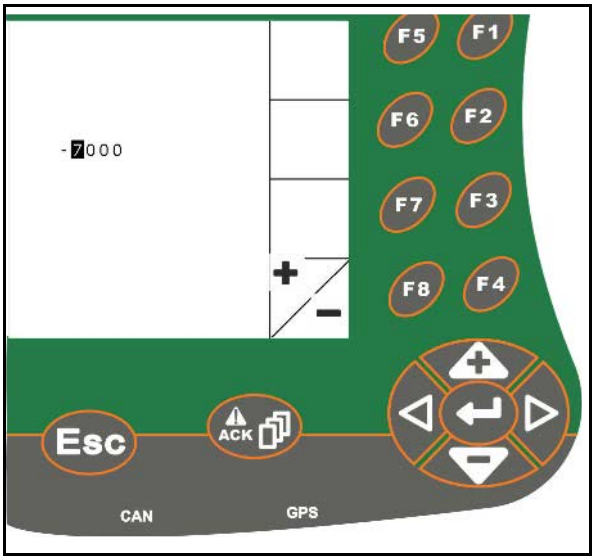
- , , , Choose letters or numbers in the selection field.
- Confirm the selection.
- Move the marker in the input line to the left.
- Move the marker in the input line to the right.
- Delete in the input line.
- 123 Numbers in the selection field
- Abc Letters in the selection field, change capital / small letters
- Confirm the text entered.

5.3.2 Entering numbers

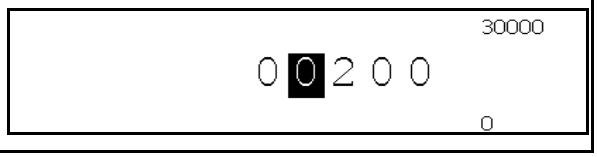
- + Increment the number
- - Decrement the number

or

- Selection of the decimal place
- Adjust the selected decimal place



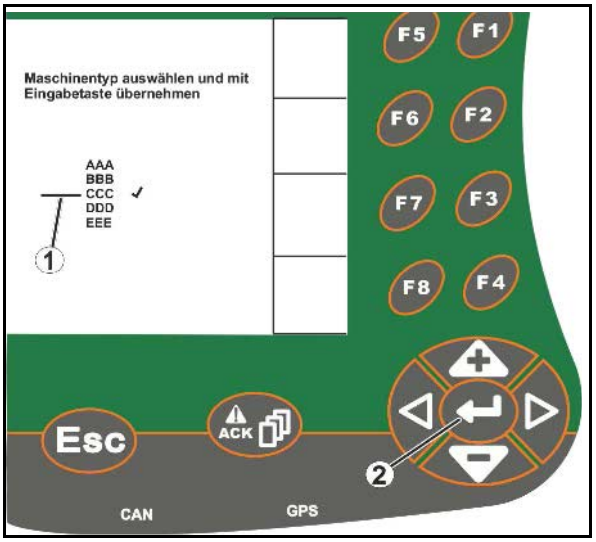
The limit values for the entry are displayed on the right of the input value:



To enter negative values (e.g. GPSx), put the decimal place to 0 via , then enter the negative region with -.

5.3.3 Selection of options

1. Position selection (1) using and .
2. Confirm the selection (2).



5.3.4 Toggle function

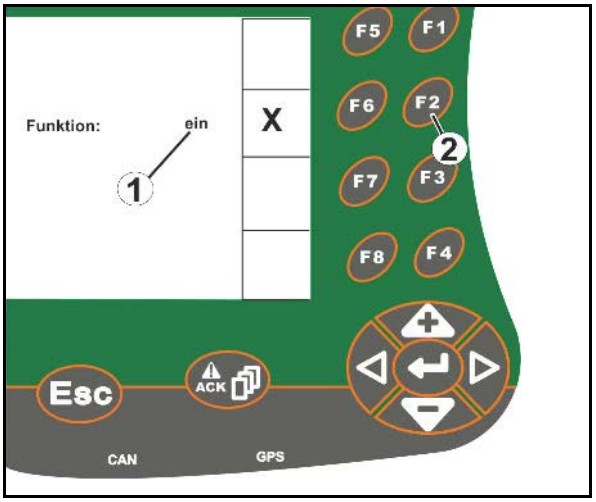
Switching functions on/off:

- Press function key (2) once

→ Function **on** (1).

- Again press function key

→ Function **off**.



5.3.5 Entry for ISOBUS, terminal setup and TaskController

(1) Entry by selecting a function line.

(2) Entry by selecting a grey function field.

- Make a selection
- Confirm the selection
- Accept the selection

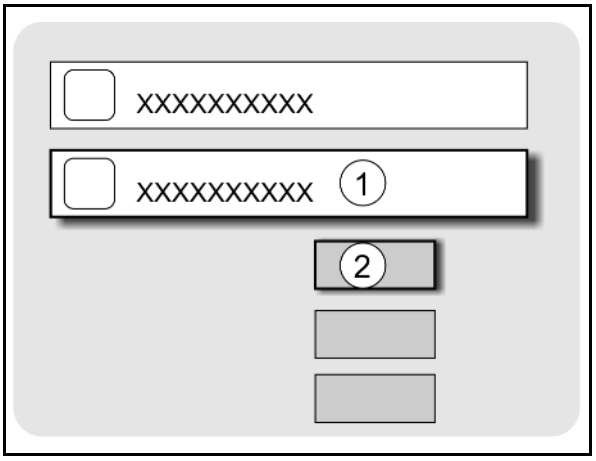


Fig. 3

6 Implement control

Switch to the implement control control menu

6.1 Operating mode as ISO-VT terminal

The AMATRON 3 can be used as an ISOBUS terminal, if the machines meet the corresponding requirements.

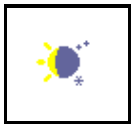
Please also observe the operating instruction of the corresponding ISOBUS software for the implement control.

6.2 Operating mode as AMAZONE terminal

Please also observe the operating instruction of the corresponding AMABUS software for the implement control.

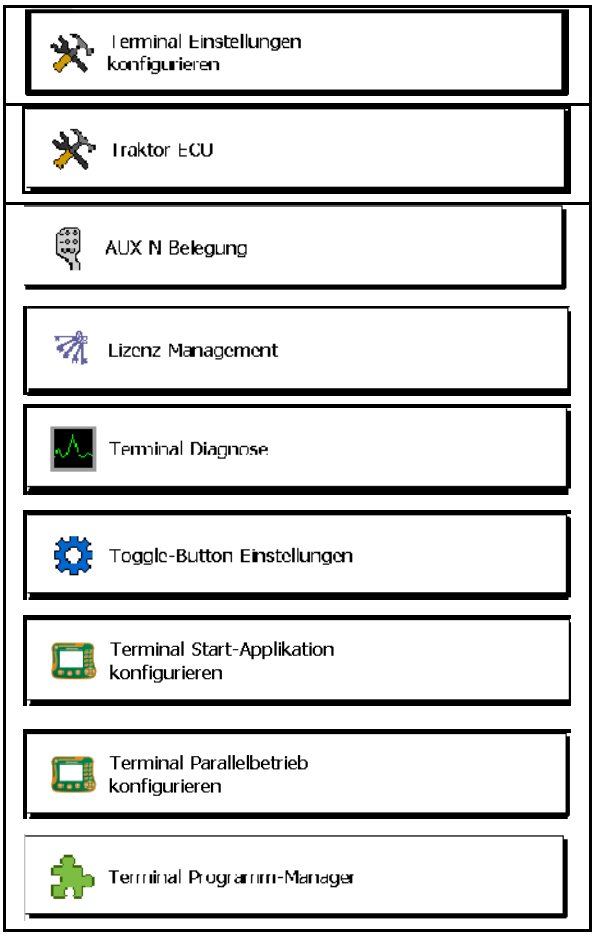
7 Terminal Setup

Change to the terminal setup menu



Day night switch

- Configure the terminal settings (see page 26)
- Tractor ECU (see page 27)
- assignment, assigning functions to the multi-function stick as desired (see page 30)
- License manager (see page 32)
- Terminal diagnosis (see page 33)
- Toggle button settings (see page 34)
- Configure the start application terminal (see page 34)
- Configure the parallel operation terminal (see page 35)
- Terminal program manager (see page **35**)

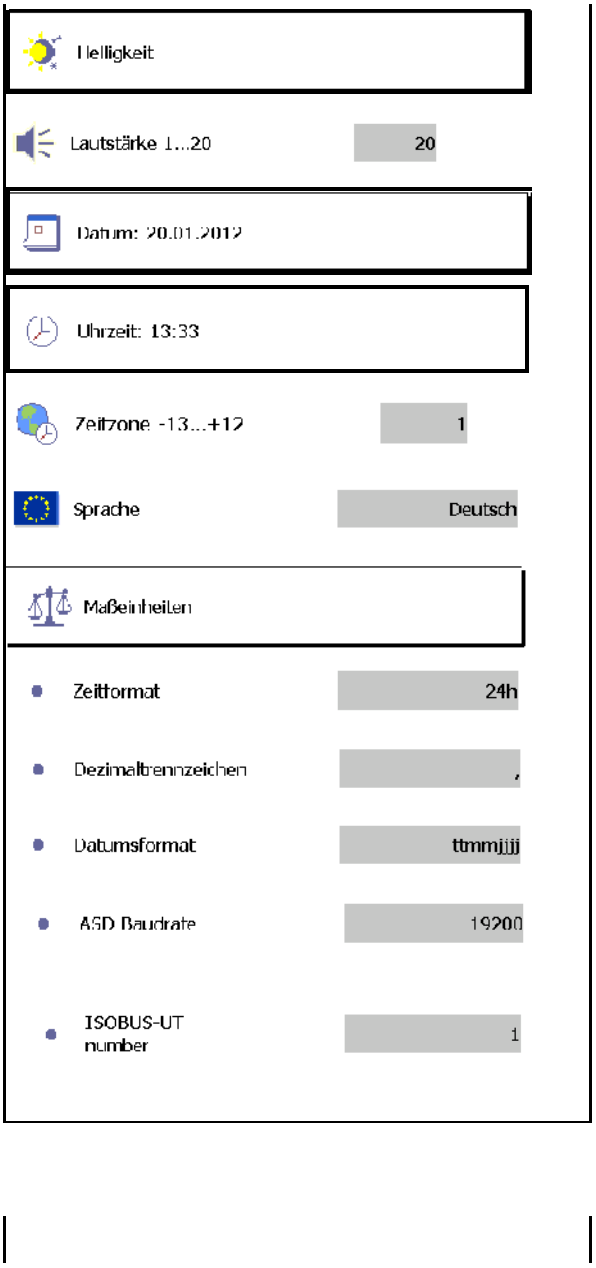


Return to the terminal setup from the sub-menu

7.1 Terminal settings

- Adjust the brightness
- Adjust the volume
- Set the date
- Set the time
- Set the time zone
- Set the language
- Set the unit (only ISOBUS)
- Set the time format
- Set the decimal separator (only ISOBUS)
- Set the date format
- ASD-Baud rate
- ISOBUS- UT number (only ISOBUS)

→ When using multiple terminals, assign a number to the AMATRON 3 for identification.



7.2 Tractor ECU (simulated)

The tractor ECU of an ISOBUS tractor transmits tractor data that is required by the implement.

In the simulated tractor ECU, tractor data for several tractors can be entered manually.

The tractor ECU (simulated) must be created and active:

- For all AMABUS implements

  AMABUS implements cannot adopt any data from an ISOBUS tractor.

- For ISOBUS implements, if no ISOBUS tractor is available.

  ISOBUS implements require an ISOBUS tractor for data transfer.

- For ISOBUS implements, if the coupling data of the ISOBUS tractor should not be used.

  Coupling data (entries for the tractor geometry) that is required for switching using the GPS switch.

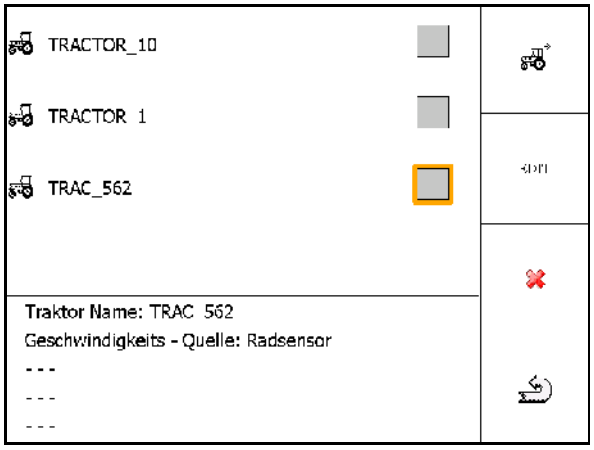
  A separate connecting cable is required for this purpose, see Page 13.

Tractor ECU created and active -

Tractor ECU created and not active -

Display selectable tractors:

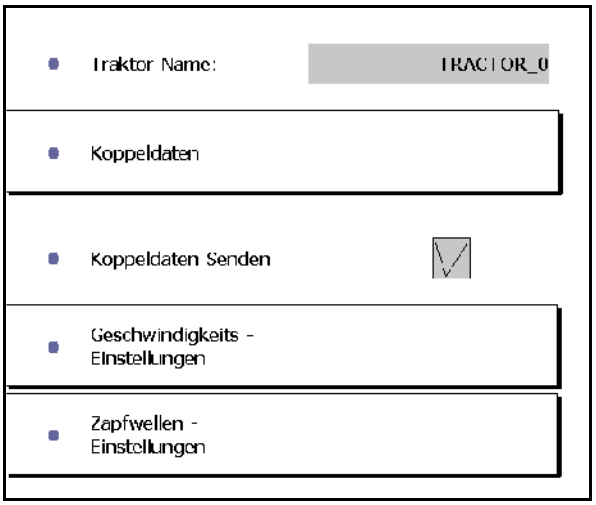
Display tractor data:



- create additional tractor
- edit selected tractor
- delete selected tractor

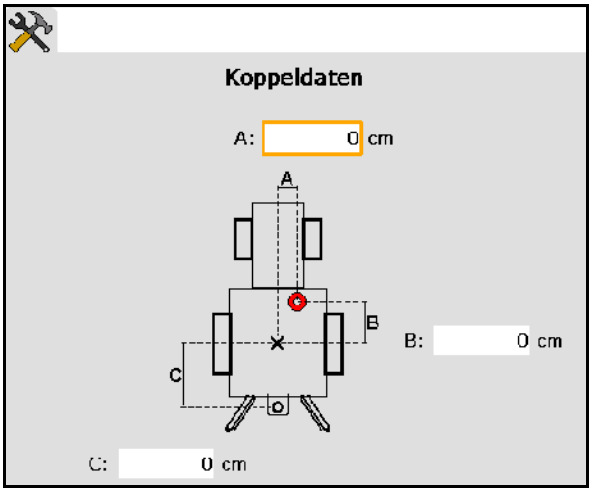
Create or edit a new tractor

- Enter any name for the tractors
- Enter dimensions for coupling points and position of the GPS receiver.
- Send coupling data.
- Speed settings
- PTO shaft settings



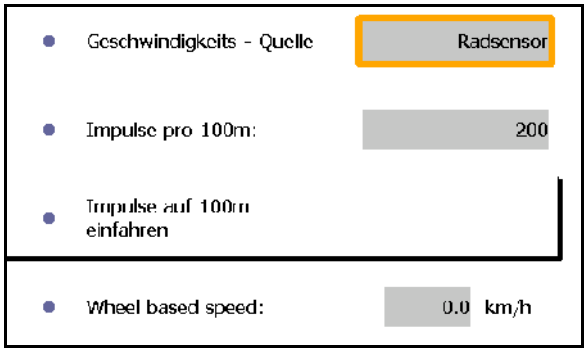
Coupling data

- A: Position of the GPS receiver at the centre of the machine in a transverse direction-
  - o right – positive value
  - o left - negative value
- B: Position of the GPS receiver in relation to the rear axle in a longitudinal direction
  - o before the axis – positive value
  - o after the axis - negative value
- C: Position of the trailer coupling / lower link mounting points in relation to the rear axle in the longitudinal direction



Speed settings

- Select source for speed signal.
- Enter value for pulse per 100 m, or



- determine value for pulse per 100 m:

1. Start
2. Drive straight ahead for exactly 100 m, stop.
3. Stop

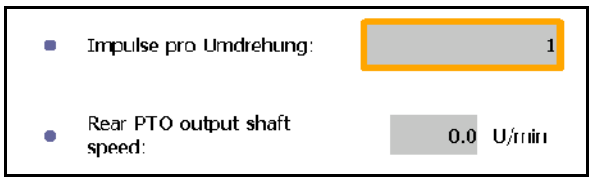
→ The pulses determined are displayed.

→ Display current speed

PTO shaft settings

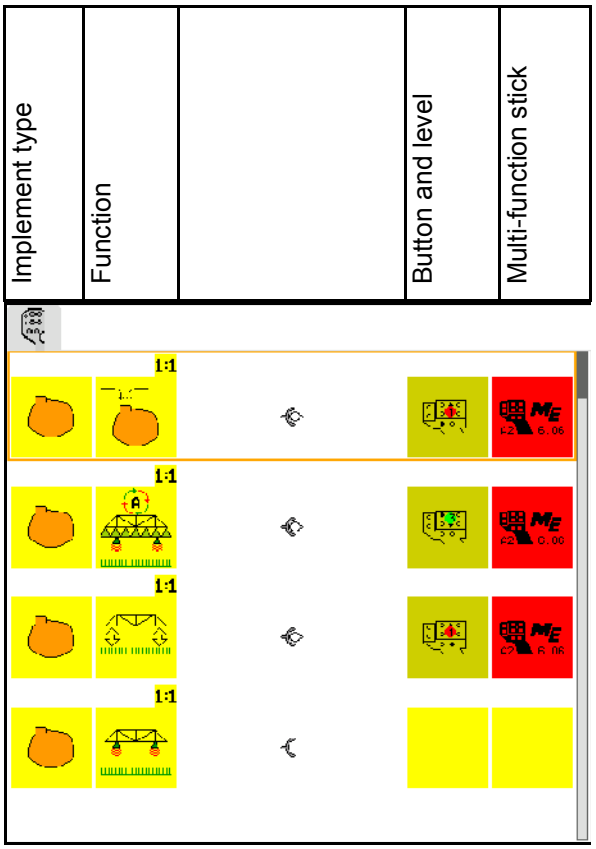
- Enter number of pulses per revolution.

→ Display current PTO shaft speed



7.3 AUX-N assignment (ISOBUS)

If a freely configurable multi-function stick is connected, the functions of an ISOBUS implement can be assigned to a button on the multi-function stick.



Perform key assignment:

→ Current key assignment is displayed.

1. Select a function from the function list.
2. Confirm selection.

→ The list of keys is displayed.

3. Press the desired key on the desired level on the multi-function stick (not possible on all multi-function sticks).

   Alternatively, select a key assignment in the menu

   and confirm the selection.

→ The selected key is assigned to the selected function.

- Delete all assignments
- Delete an assignment
- Back

WARNING

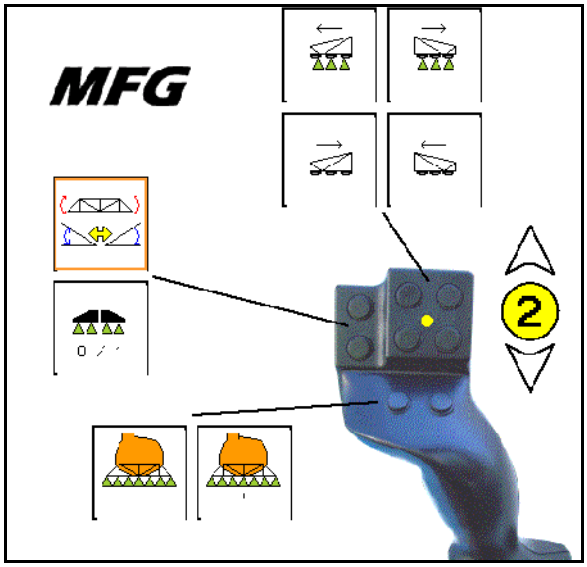
Performing unintended functions due to incorrect operation with a freely configurable multi-function stick.

After starting the AMATRON 3, the assignment of the connected multi-function stick is displayed.

1. Carefully check the key assignment.
2. Confirm the key assignment.

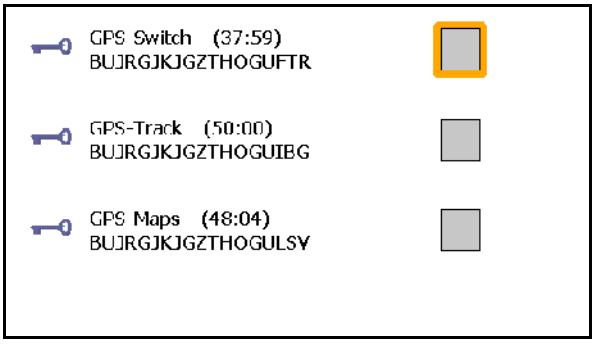
The key assignment can be displayed on the AMATRON 3.

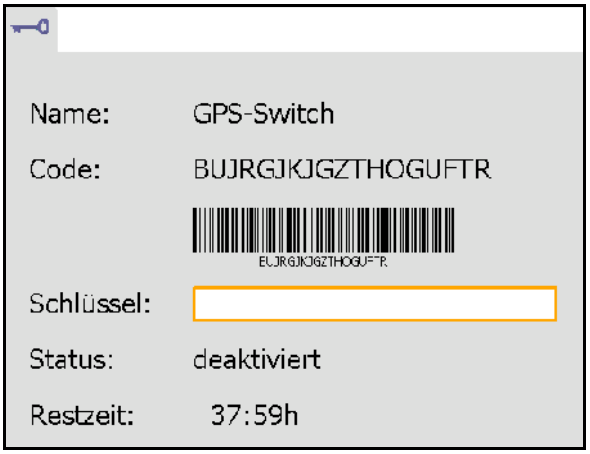
To display the key assignment on the various levels, activate the level on the multi-function stick.



7.4 License manager

- After new licenses have been purchased, select the application for activation and enter the code number provided.
- The remaining time is displayed for all 50 hour test versions.





7.5 Terminal diagnosis

- Software versions

→ The top line shows the version of the AMATRON 3.

The following lines specify the versions of the software modules.

- USB manager

Here you can view and delete task data and log files. Save the data to a USB stick beforehand. A list of screenshots is also shown.

- Pool management

Display the control masks of all machines which were loaded in the past. If a machine is no longer required, this pool can be deleted.

- Reset

Reset the GPS switch / track:

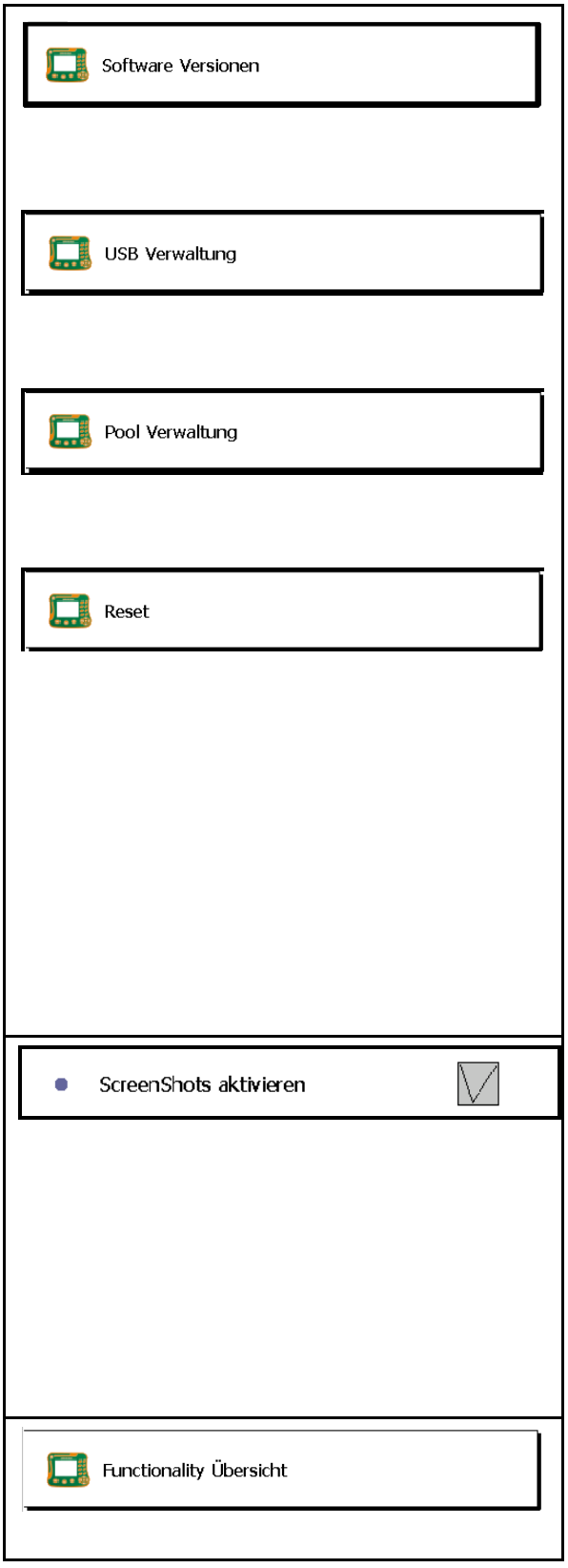
All settings in the GPS applications are reset. The created machines are deleted.

Reset the AMATRON 3 Terminal settings:

all settings in the AMATRON 3 (language, etc) are reset.

Factory settings:
reset the GPS switch / track and AMATRON 3.

the whole Amatron 3 with all of its application is reset.



- ☑ Creating screenshots possible

For this:

1. display screen content for screenshot.
2. press keys at same time.

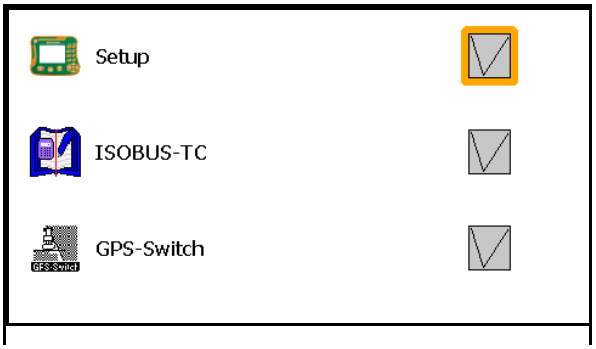
→ The Screenshots folder is created on the USB stick.

→ The file with the screen content is coped to the folder.

- Function overview
  - Job computer diagnosis
  - CanTrace settings

7.6 Toggle button settings

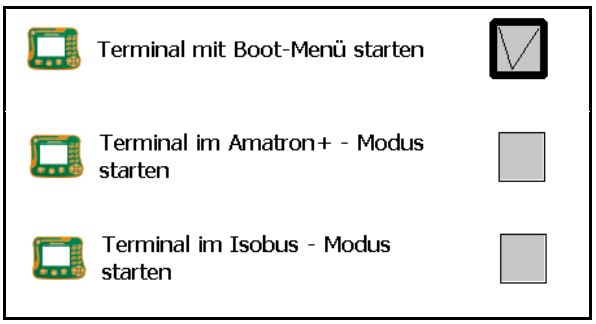
Selection of the applications that can be accessed directly by toggling with button .



If the terminal setup (service) is deactivated, it can be accessed again and activated by pressing the button for three seconds.

7.7 Terminal start application

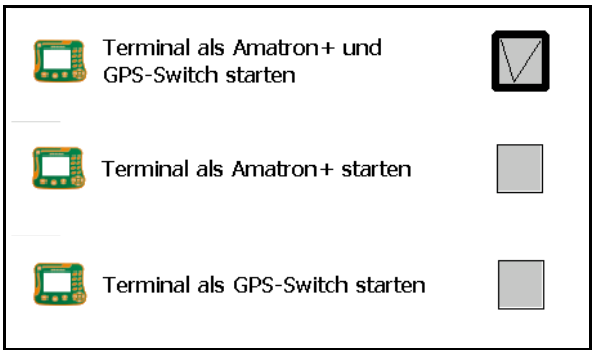
- Start the terminal with the Boot menu
- Start the terminal in AMABUS mode
- Start the terminal in ISOBUS mode



7.8 Configure the parallel operation terminal

In case the implement control and GPS application should run on different terminals, the desired function must be assigned to the respective terminal.

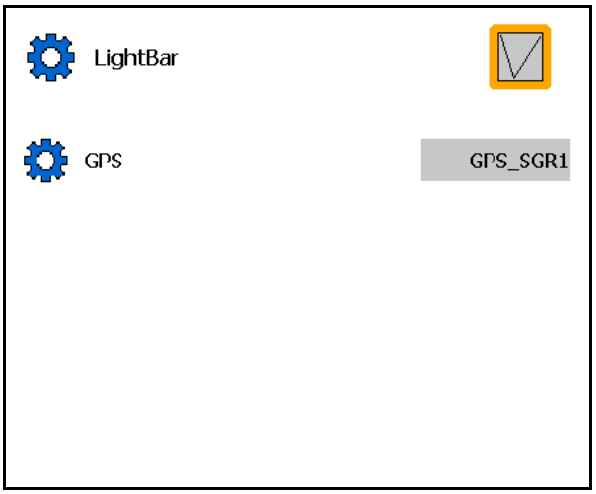
- Start the terminal as AMATRON and GPS switch
- Start the terminal as AMATRON
- Start the terminal as GPS switch



7.9 Terminal Program Manager

- activate external light bar.

  The external light bar is connected between the GPS input on the Terminal and the GPS receiver, see page 13.
- Select the GPS driver corresponding to the GPS receiver
  - Deactivated
  - GPS_A100/101
  - GPS_NovAtel
  - GPS_SGR1
  - GPS_STD (standard)



To configure the GPS receiver, see page 50.

8 TaskController Task management

Change to the TaskController menu

The TaskController is an application that represents an interface between the agricultural implement and the Farm Management System on the operating terminal.

Using the TaskController, you can

- Master data and jobs are imported.
- Create master data.
- Create and edit jobs.

Master data that is imported from the Farm Management System cannot be changed here.

The following functions are supported:

- create jobs in the terminal.
- view and process tasks which were planned with the aid of the agricultural field record.
- transfer application maps from a job to the GPS switch.
- send defaults to the ISOBUS task manager.
- document implementation of the work. The type of documented data depends on the type of the ISOBUS task manager.
- save the working results so they can evaluated using the PC software.
- record job data without gaps.

USB stick

The USB stick has two roles:

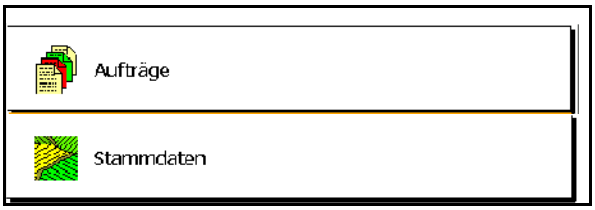
- it is used to transfer data between the agricultural field record and the terminal.
- it is used as an external memory during operation.

The USB stick must always be plugged in during operation.

Display - USB stick not inserted / Task Data folder not created:

The TaskController consists of the

- Jobs
- Master data



-

  To active the job – when a job is started

  for the job list – when **no** job is started.

-
  - TaskData folder is created on the USB stick. The ISO-XML job data from the field file is created here.
  - format USB-Stick, delete data.
  - Set TaskController mode, see page 45
- Save data to USB stick.

Save the data before removing the USB stick in all cases.

Otherwise you may lose all of the task data.

8.1 Jobs

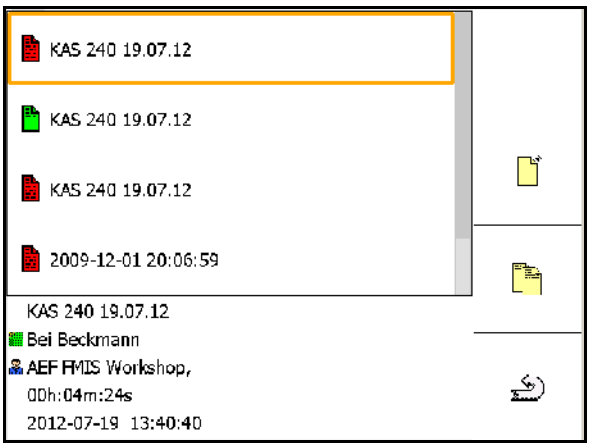
Job list:

All jobs are displayed:

Job started (green)

Job ended: (red)

New job, empty: (yellow)



Data are displayed for the selected job:

When the marked job has been selected, it can be started or finished.

- create new job
- copy job / split ended task
- back

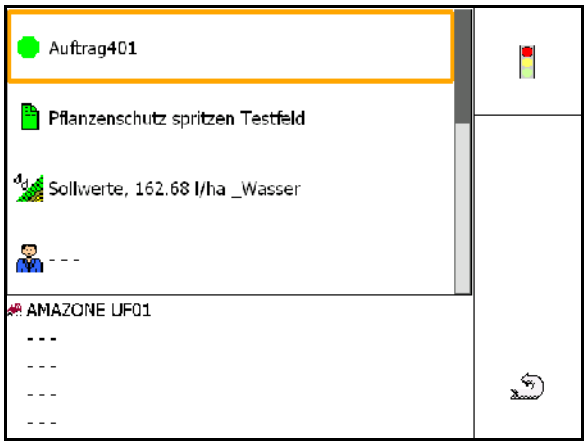
Empty jobs cannot be changed:

1. Open marked job.
2. EDIT Edit job

Starting a new or finished job:

- Start the marked job before starting work
- back

Started job:



- Enter setpoint.

→ Application maps are automatically assigned (GPS maps, ASD, job with application map).

The started job with setpoint / application map can be processed.

- end jobs already started

→ A job that has been ended can be restarted.

- back

Fixed setpoint:

- A setpoint must be entered for each job.

Variable setpoint through application map:

- Imported jobs can contain an application map.
- Application maps imported through GPS maps can be assigned to the job.
- Setpoints can be assigned to the job through the ASD interface.

The application map is shown in GPS switch and is used for monitoring the target rate.

- Entries in the started job

  - Working phases
  - Adjust the target quantity and allocate the implement
  - Customer
  - Farm
  - Field
  - Worker responsible
  - Tractor
  - Driver
  - Type of work

8.2 Master data

The following objects are included in the master data:

Setpoints		See page 41
Fields		
Farms		
Customers		
Equipment		See page 42
Workers		
Products		

The sub-menus can be called up separately. Changes cannot be carried out here.

- Open highlighted object
- Search for object
- Create new object
- Delete object
-

Edit object
- back (always back to the main page)

8.2.1 Setpoints

- Individual setpoints can be created.
- Jobs can contain application maps

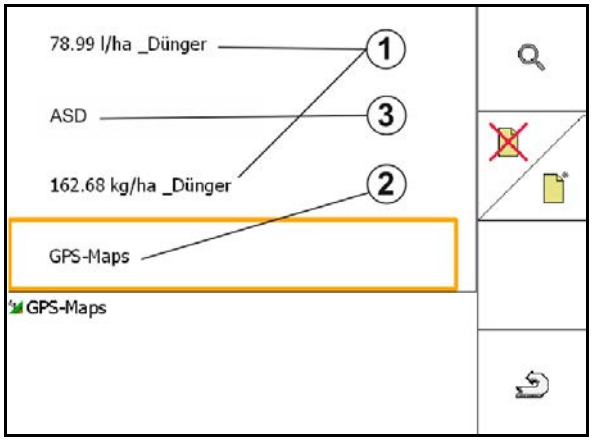
  Display: digit, unit, medium

- Setpoints can be imported via GPS maps (shape file).

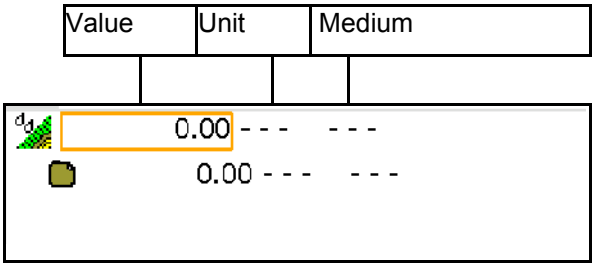
  Display: GPS maps

- Setpoints can be provided through the ASD interface.

  Display: ASD



Enter setpoints



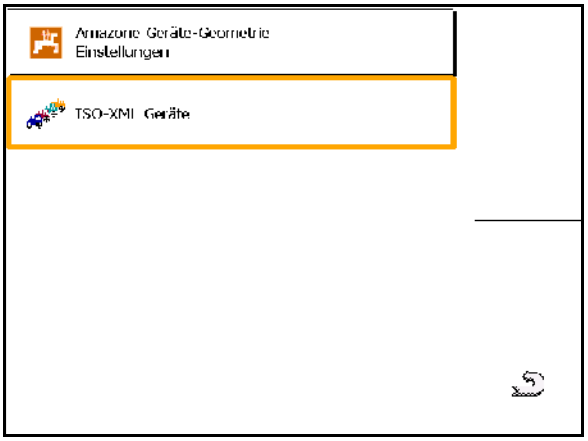
8.2.2 Enter implements

Amazone eqpt. geometry settings

- AMABUS implements must be logged in.
- ISOBUS and AMABUS: other implements can be logged in.

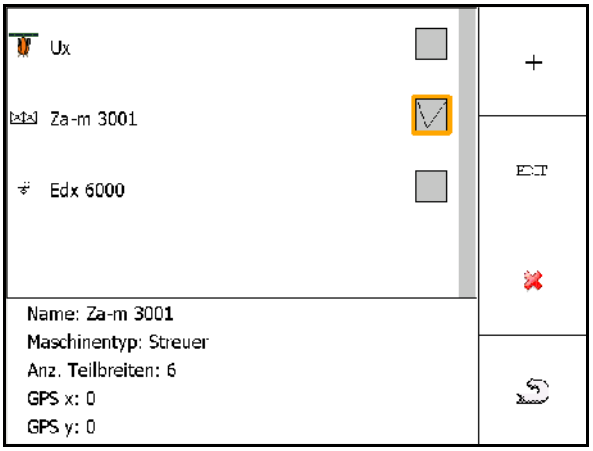
ISO-XML eqpt.

- All implements on the ISOBUS login here automatically.



Amazone eqpt. geometry settings

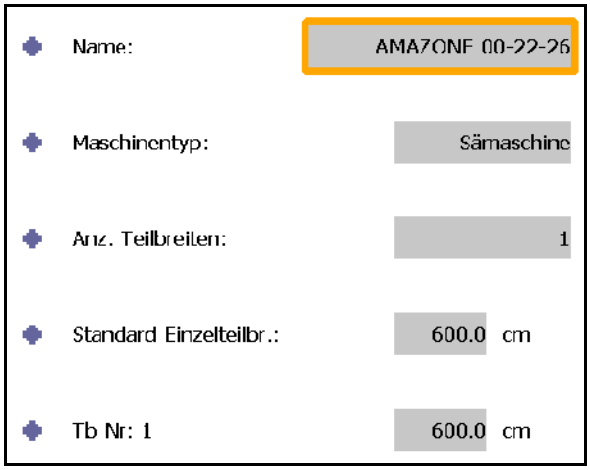
- Implement active
- Implement not active
- Create new implement
- Change settings for an existing implement
- Delete highlighted implement
- Back and confirm the activation of a new or changed implement



Create or change implement

- Name
- Implement type

  ISOBUS: only manual implements possible.
- Number of part width sections
- Standard individual section width
- Part width sections 1, 2, etc. (enter individually if different from the standard individual section width)
- GPS x enter



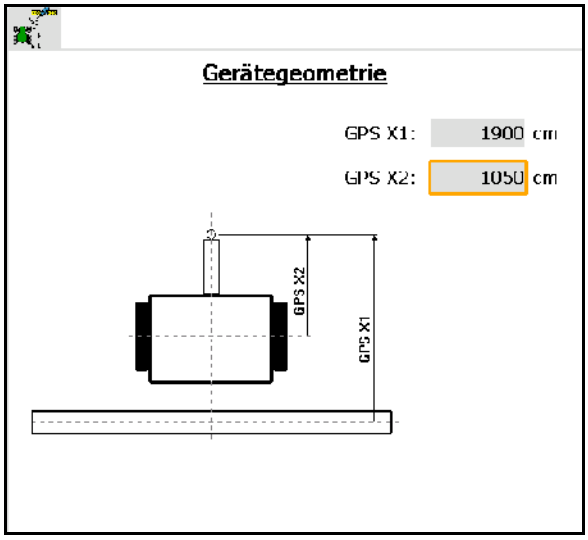
GPS X1

The dimension GPS X1 describes the distance between the coupling point to the metering device.

- Field sprayer: distance to the spray nozzles.
- Fertiliser spreader: distance to the centre point of the spreading discs.
- Seed drill: distance to the rear coulter.

GPS X2

The dimension GPS X1 describes the distance between the coupling point to the axle.



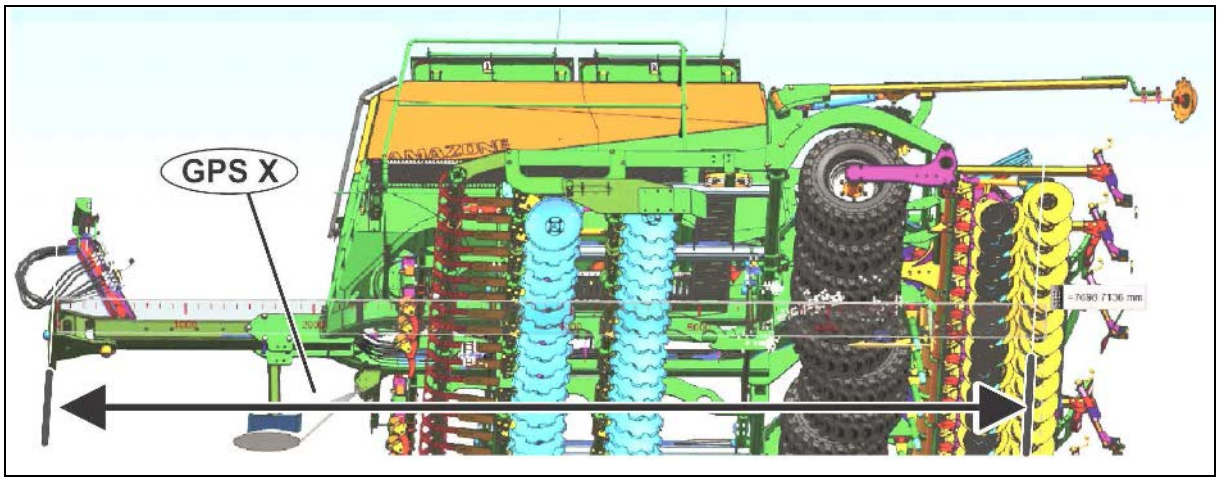
Fertiliser spreader (AMABUS):

To adjust the switch-off point of the fertiliser spreader, the GPS X1 value can be manipulated.

Manipulate the switch-on point over the headland distance, see page 59.

GPS X for seed drills

Example:



Implement		GPS X1 [cm]			Implement		GPS X1 [cm]	
		min.	max.				min.	max.
EDX	9000-TC	815			Cirrus	6000 Activ	685	
	6000-2	170				6001 Activ	685	
	6000-TC	725				6002 Activ	685	
	6000-2C	170				3001	718	
	9000-T	815				4001	718	
AD-P	303 Special WS	224	236			6001	718	
	303 Special RoteC	210	221			3002	718	
	353 Special	224	236			4002	718	
	403 Special	210	221			6002	718	
	303 Super RoteC	205	209		Cirrus	3003	588	703
	303 Super RoteC+	217	221			3003 compact	612	727
	403 Super RoteC	205	209			3503	612	727
	403 Super RoteC+	217	221			4003	612	727
Citan	6000	649- 666- 682 (Standard)				6003 -2 min.	612	727
					Cayena	6001	423	503
	8000	771				6001-C	423	503
	9000	771			Condor	12001	1107	1257
	12000	921				15001	1107	1257
	12001	955			PS	RoteC	222	
	15001	1105				RoteC+	234	

Especially for seed drills, the GPS X1 value should be entered / determined with the maximum accuracy.

8.3 Working with or without the TaskController

- Switching the TaskController on/off.

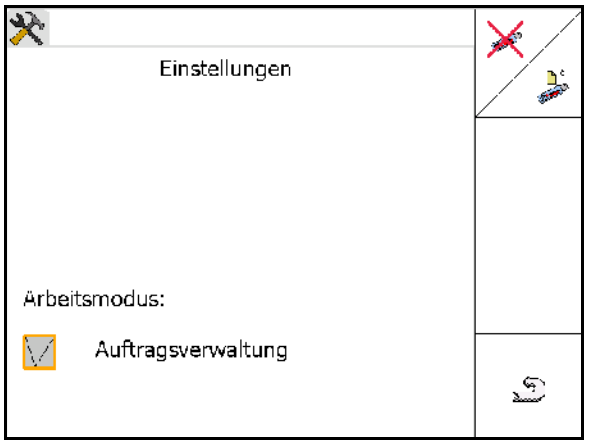
The TaskController application can be run in two modes:

- With job management using TaskController
  - The TaskController is fully functional.
  - Before starting work, a job must be started in TaskController.

- Without job management using TaskController
  - Implement-internal job management active
  - Use this mode if you do not use the TaskController or it has not been activated.
  - GPS switch is possible without TaskController.
  - Only the connected implement is displayed.
  - Possible to work without a USB stick.

This is how to change the mode of the TaskController application:

- with job management using TaskController
- without job management using TaskController (implement-internal job management)



8.3.1 Implements with AMABUS software and TaskController (ISO)

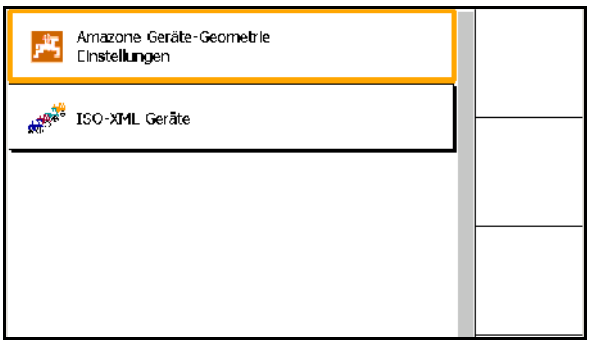
The TaskController cannot be used with:

- Seed drills with AMABUS software V 6.04 and older, V 2.21 and older.
- Precision airplanters with AMABUS software V 5.30 and older.

→ Master data menu

With AMABUS software, the implement geometry must be manually entered in the Implements sub-menu in the TaskController.

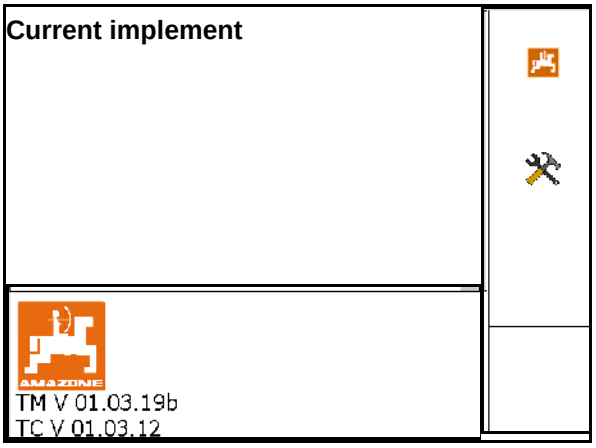
- AMAZONE implement geometry settings, see page 42



8.3.2 Implements without TaskController

Instead of the TaskController, the screen to enter the implement geometry appears.

- AMAZONE implement geometry settings, see page 42
- Switch TaskController on/off



9 Overview GPS application

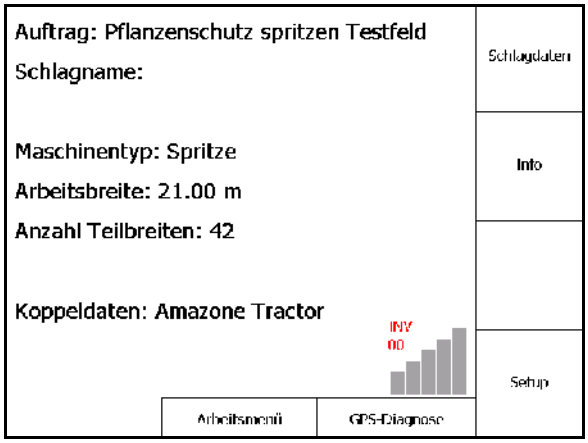
	Change to the GPS menu.

9.1 Main menu

For working with GPS switch, the following entries must be made.

The main menu displays the data:

Job started Alternative working mode: no job management	
Implement in the TaskController (automatic with ISOBUS or create with AMABUS)	
Coupling data of the tractor: (automatic with ISOBUS or TECU entry simulated)	



The main menu is divided into submenus into which the required data must be entered before beginning work.

-

Lot data menu
-

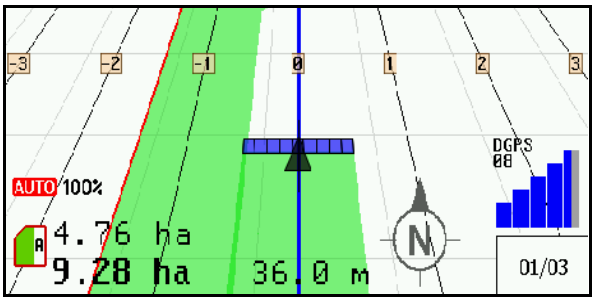
Application information
-

GPS-Switch menu

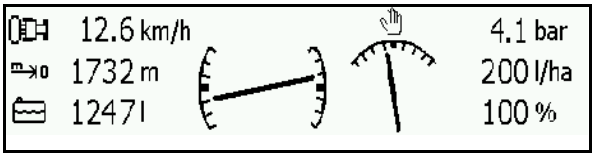
9.2 Work menu

	Main menu	ESC ⇔	work menu

GPS switch Work menu

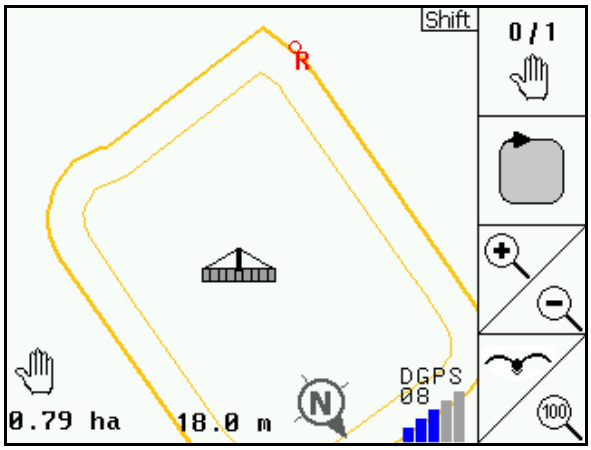


Working data from Implement control Work menu



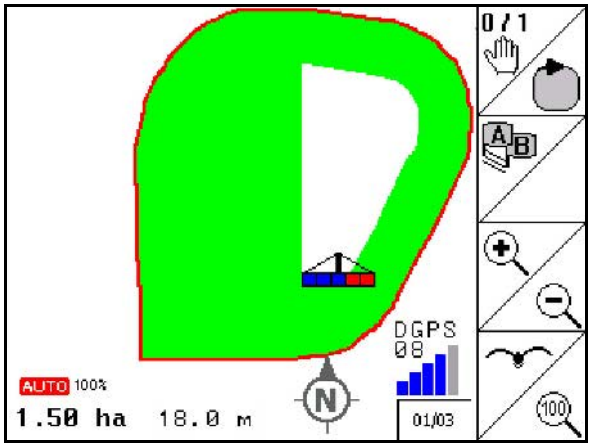
- Display depends on the software version
- Work data is only shown when Section Control and the implement control are running on one terminal.

Display of field border in the work menu.



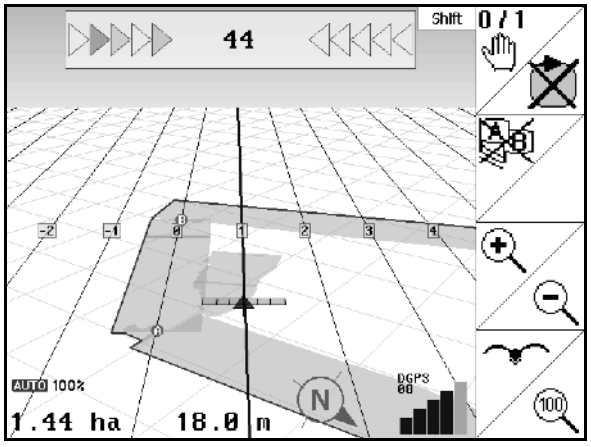
Display of partially treated field in the work menu.

(2D mode)

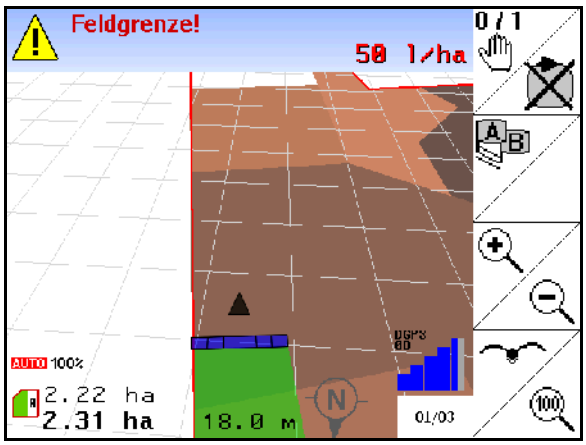


Display of treated headlands with parallel driving support systems GPS track in the Work menu.

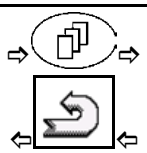
(3D mode)

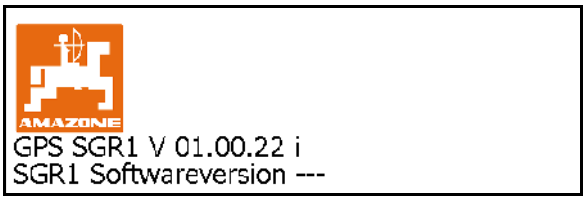


Display in 3D, Application maps loaded in the Work menu.



9.3 GPS diagnosis menu

	Main menu		GPS- diagnosis menu



The GPS receiver selected in the Setup Terminal is displayed:

Before making adjustments:

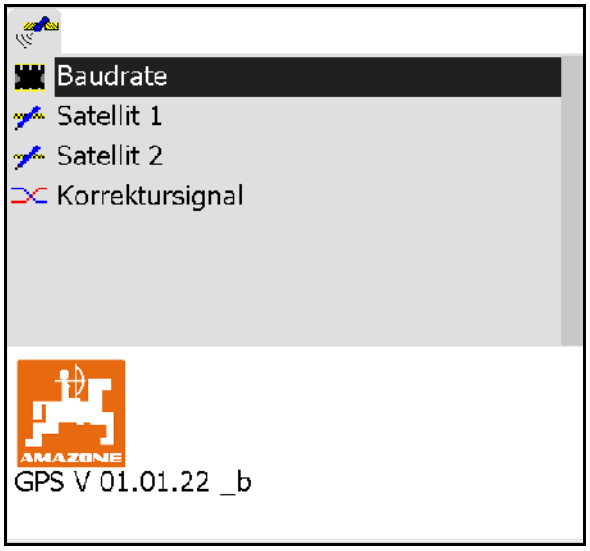
- The light bar must be deactivated in the Terminal Program Manager sub-menu in the Setup Terminal, see page 35.
- Connect the GPS receiver directly to the AMATRON 3 (remove the light bar).

GPS receiver A100 / A101, NovAtel, standard

- baud rate to 19200. (standard)

Change the baud rate:

1. Adjust the baud rate.
2. Restart AMATRON 3.
3. Changed baud rate is transmitted to the GPS receiver.

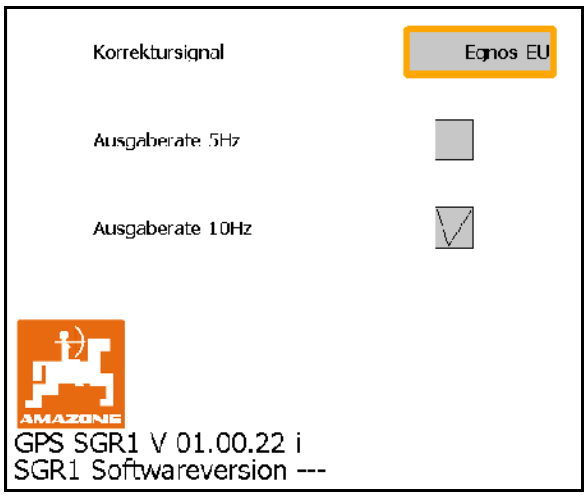


A100 / A101, NovAtel:

- Set satellite 1: 120.
- Set satellite 2: 126.
- Correction signal: set EGNOS.

GPS receiver SGR1

The configuration is done automatically. For higher accuracy of the signal evaluation, the output rate can be increased.



- Select correction signal
- Select the output rate for the data.

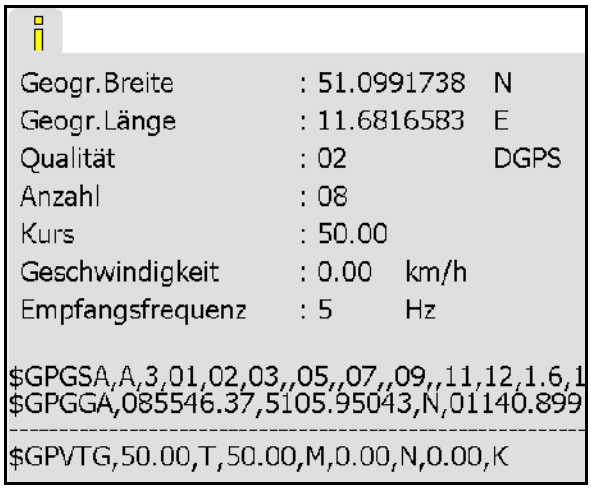
→ Output rate of 5 Hz is standard

→ Output rate 10 Hz

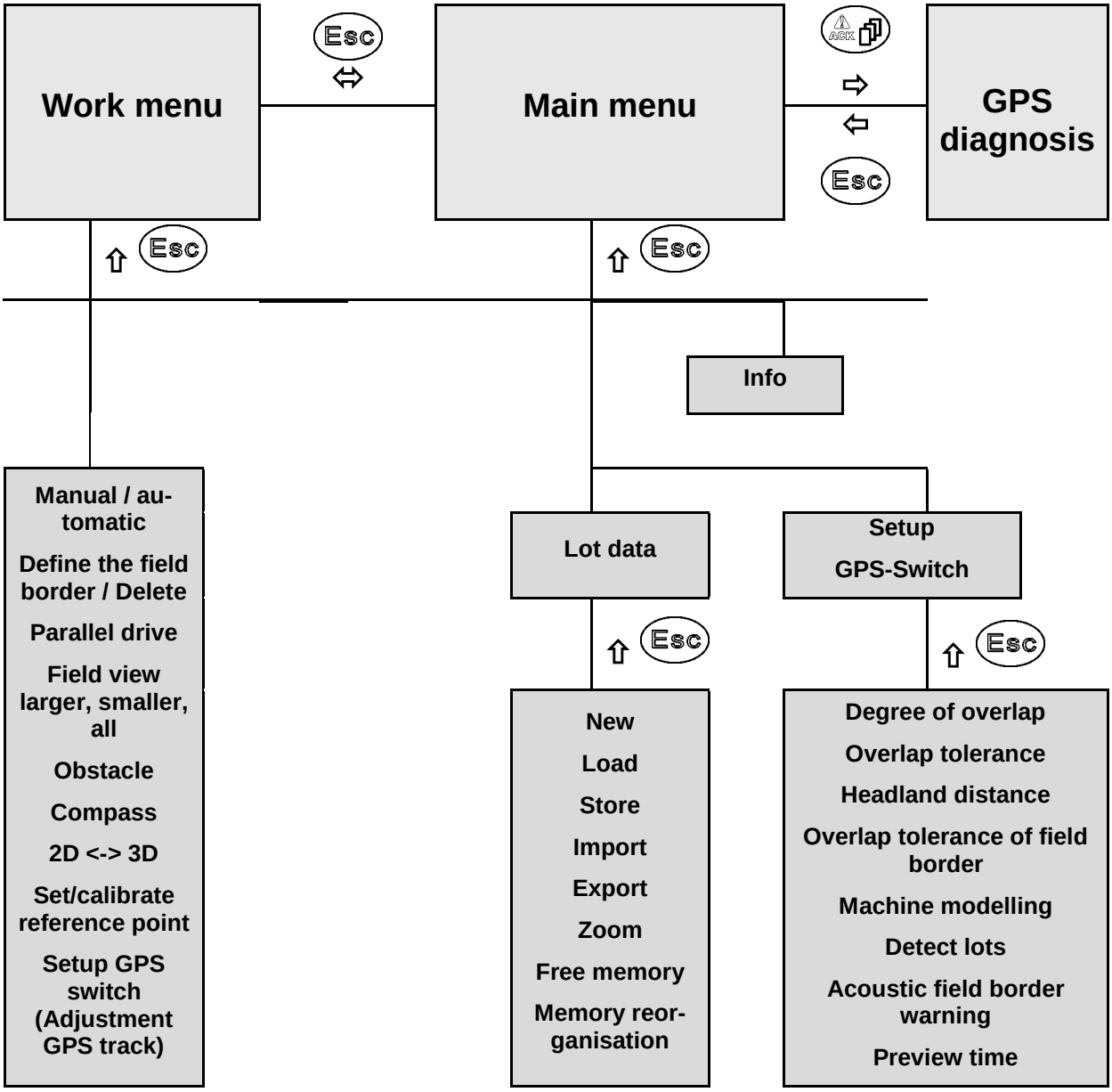
- OK Confirm output rate

- **GPS data display**

The GPS diagnosis shows current data about the GPS signal and the raw data for troubleshooting.



9.4 Hierarchy of the GPS-Switch menu



9.5 Definition of the GPS parameters

GPS

Global Positioning System

DGPS

Differential GPS

Correction system increases accuracy to +/- 0.5 m (0,02 m with RTK).

HDOP

Horizontal Dilution of Precision (Quality of GPS values)

9.6 Requirements for the GPS quality

GPS quality for the GPS-Switch depending on parameters GPS, DGPS and HDOP.

		GPS quality
DGPS	0 to 6 (target state)	Good
	HDOP 6 to 8	Medium
	HDOP greater than 8	Poor
GPS	HDOP 0 to 6	Medium
	HDOP 6 to 8	Poor
	HDOP greater than 8	Poor

Good quality:

- Working in automatic mode is possible:

Medium quality:

- Working in automatic mode is possible.
- Worked area is shown in yellow

Poor quality:

GPS too imprecise. Field is no longer shown on the GPS-Switch. Thus the worked area is also not marked, which means that neither automatic mode nor creating a field border is possible.

Poor GPS or malfunctions always cause the GPS-Switch to switch over to manual mode!

Switching to manual mode always causes the machine to switch off.

10 Commissioning the GPS application

10.1 Initial commissioning

- When a new GPS receiver is used for the first time, it needs a few minutes to initialise. Only then does the GPS-Switch receive signals.
- When it is used later, it takes approximately 30 seconds for the GPS-Switch to receive DGPS signals.

10.1.1 Connection to a third-party GPS system

If using a third-party GPS system instead of the AMAZONE GPS receiver, the following entries must be made on the GPS system:

- Serial interface must be present, Connection via 9-pin sub-D RS232 connector
  - Speed: 19200 baud
  - Data: 8 data bits
  - Parity: No parity
  - Stop bits: 1 stop bit

    (8N1)
- Compatible data records (NMEA protocol)
  - GPGGA, GPVTG(in 5 Hz), GPGSA (in 5Hz or 1 Hz) data records
- Correction signal (DGPS) must be present

10.1.2 Basic state

Basic state is the state that the machine is to be in after it is switched on and before functions are actuated.

After the entire system is switched on, the system is in manual mode. The machine is in the **basic state**.

Sprayer:

- Part width section valves closed

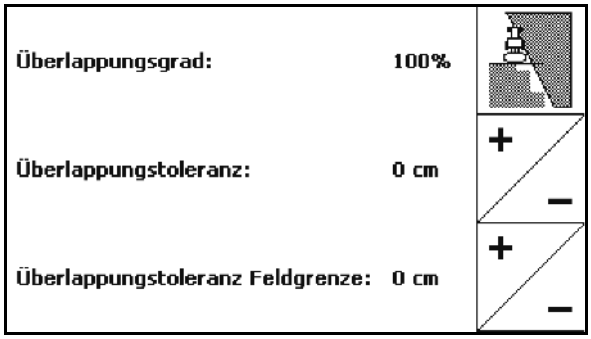
Spreader:

- Spreader discs off
- Shutter closed

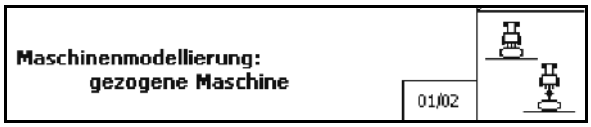
10.2 Setup GPS switch menu

→ **Select** Setup **from the Main menu:**

Page one 01/02

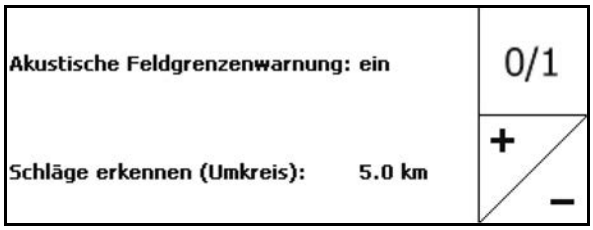


- Enter degree of overlap - see page 57.
- Enter overlap tolerance - see page 58.
- Enter overlap tolerance at field border, only for field sprayer, - see page 59.

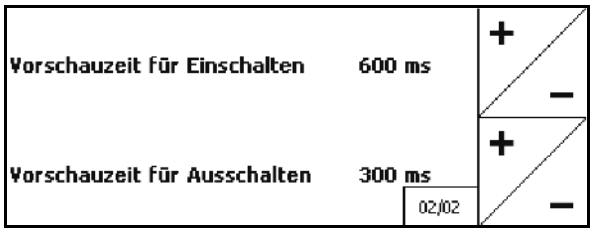


- By means of machine modelling, the various characteristics of the different machine types are simulated.
  - o deactivated (machine with three-point attachment)
  - o Pulled machine
  - o Self-propelled machine

Page two 02/02



- Switching on/off the acoustic field border monitor when going beyond the field border.
- ‚Specify radius in km in which fields are displayed when loading.



- Switch preview time for width sections on in advance, only for field sprayers and seed drills, see page 60.
- Switch preview time for width sections on with delay, only for field sprayers and seed drills, see page 60.

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- Field sprayer, AMABUS:

  Automatic boom lowering within the field boundary.

  Enter the time in milliseconds.

  Time before switching on the sprayer in which the booms are lowered.

  Default: 0 ms

  Maximum: 5000 ms

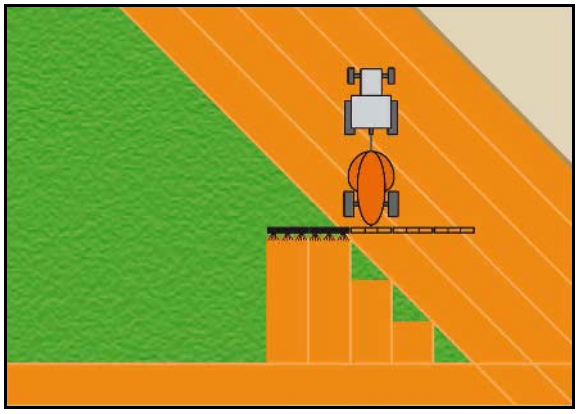
10.2.1 Degree of overlap

When working, it is possible that areas of a part width will be covered that have already been tilled or are not supposed to be tilled.

The degree of overlap specifies whether the corresponding part width section is switched during this process.

Degree of overlap 0 %:

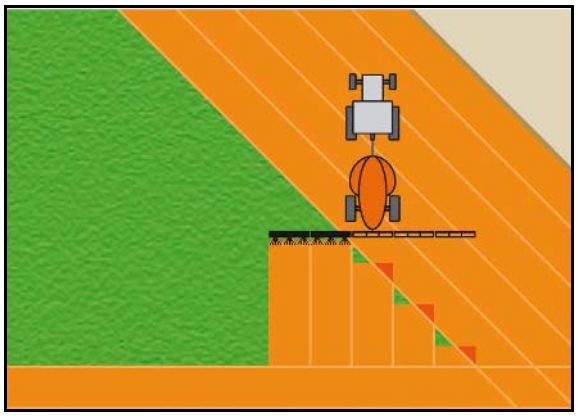
→ As soon as there is overlap, the corresponding part width section is switched off.



Degree of overlap 50 %:

→ As soon as 50 % of a part width section overlaps, the part width section is switched.

Recommendation for fertiliser spreaders!



Degree of overlap 100 %:

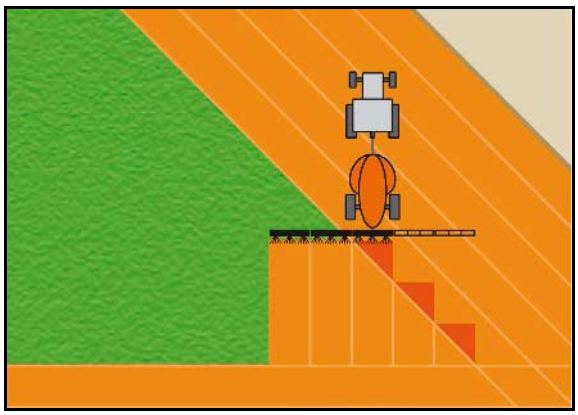
→ The part width section is not switched off until there is complete overlap of a part width section.

For field sprayer and fertiliser spreaders:

At the border, work is always carried out with a degree of overlap of 0%.

Only for seed drills:

Degree of overlap of 100 % is recommended.



10.2.2 Overlap tolerance

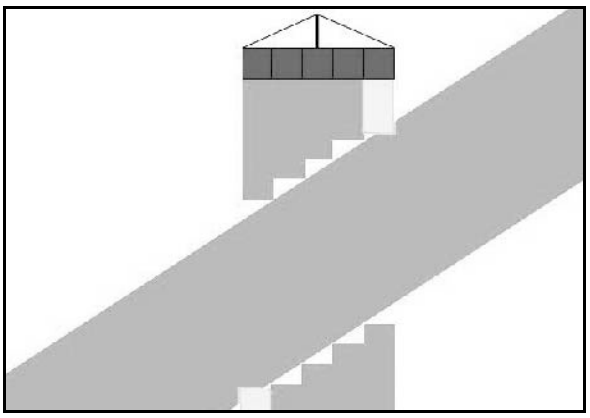
Specifies the insensitivity of the outer part width section and prevents constant switching of the part width sections with minimum overlap.

Setting range: 0 to 50 cm.

Example 1:

Degree of overlap: 0 %

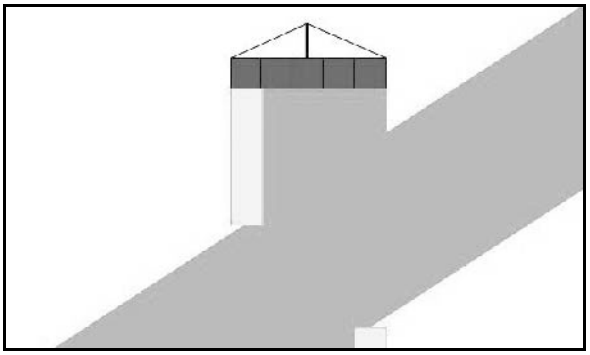
Overlap tolerance: 50 cm



Example 2:

Degree of overlap: 100 %

Overlap tolerance: 50 cm



10.2.3 Overlap tolerance at field border

To prevent constant switching of the outer part width sections at the border, the overlap tolerance at the border can be configured separately.

Set the border overlap tolerance.

- Maximum 25 cm
- Standard / recommendation: 0 cm

At his or her own responsibility, the user can change (warning message when changing) this value to a maximum of 25 cm (one-half the distance between the nozzles).

10.2.4 Headland distance

Fertiliser spreader (AMABUS):

(V) The headland distance determines the switch-on point of the fertiliser spreader when driving from the tramline into the field. (Clearance between the headlands and spreading disc)

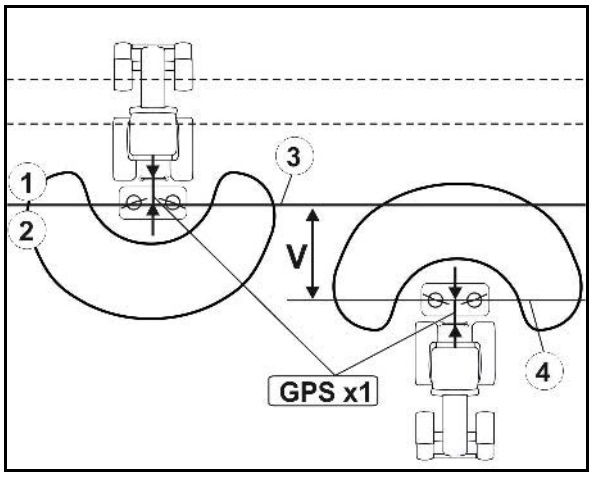
(1) Headland

(2) Field

(3) Switch-off point when driving into the headland (depending on GPS x1)

(4) Switch-on point when driving into the field (depending on GPS x1 and V)

See page59.



The headland distance V is set as standard to half the working width.

With a working width greater than 30 m or special kinds of fertiliser, adjustment may be necessary.

In order to adjust the switch-on and switch-off points of the fertiliser spreader, the value GPS X1 and headland distance can be manipulated.

Set the switch-on point by entering the headland distance only when the switch-off point (GPS X1) is correct.

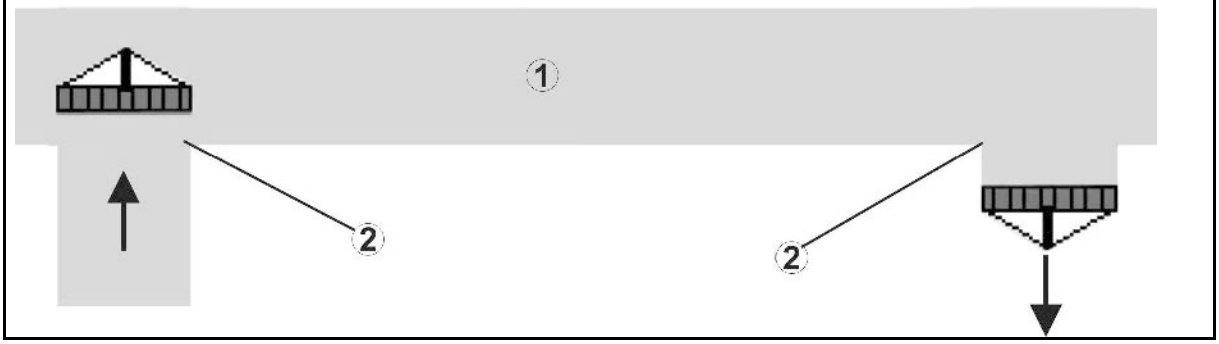
10.2.5 Preview On / Off

Not for fertiliser spreaders and ISOBUS field sprayers!

Only for seed drills and AMABUS field sprayers!

- The lead in/delay off time is used for setting a seamless working of the field
  - During the transition from non-worked to worked areas.
  - During the transition from worked to non-worked areas.
- The size of the overlapping/underlapping depends, amongst other things, on the forward speed.
- The lead in/delay off time is a time entry in milliseconds.
- Longer lead in/delay off times and higher speeds may lead to undesired switching conditions.

Optimal working of the field



(1) Headlands / worked field

(2) Seamless working of the field without overlapping

Overlapping of worked areas

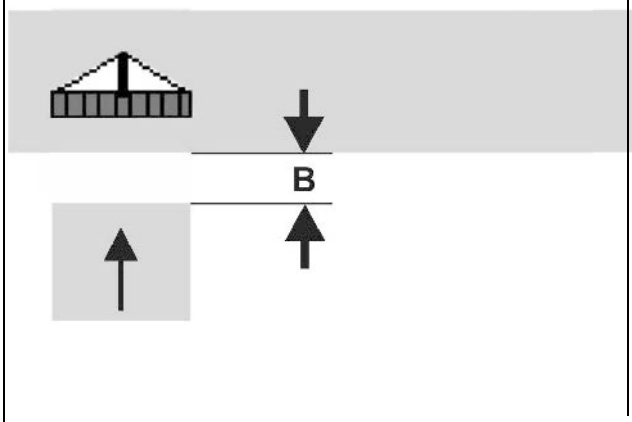
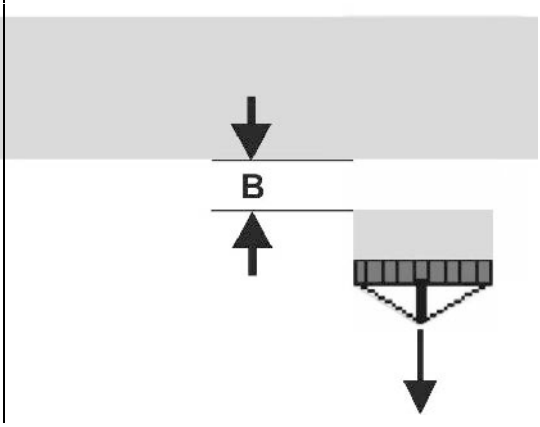
Lead in/delay off time for switching off

Lead in/delay off time for switching on

(A) Length of the overlap

- Switching off - Entering a worked area:
  - Sprayer: decrease lead in/delay off time.
  - Seed drill: increase lead in/delay off time.
- Switching on – Moving off a worked area:
  - Sprayer: decrease lead in/delay off time.
  - Seed drill: decrease lead in/delay off time.

Unworked area

Lead in/delay off time for switching off	Lead in/delay off time for switching on
	
(B) Länge des unbearbeiteten Bereichs	
• Switching off - Entering a worked area: o Sprayer: increase lead in/delay off time. o Seed drill: decrease lead in/delay off time.	• Switching on – Moving off a worked area: o Sprayer: increase lead in/delay off time. o Seed drill: increase lead in/delay off time.

Recommended on / off point delay time sowing technology

	Delay time for	Grain kg / ha		Rapeseed kg / ha		Fertiliser kg / ha	
	[ms]	100	200	2	8	40	120
AD-P 3 m	Switch on	2500	2400	2800	2600	–	–
	Switch off	2600	2800	2400	3000	–	–
AVANT 4000	Switch on	3500	3400	3900	3400	4000	3800
	Switch off	3600	3800	4300	4800	3900	4300
AVANT 5000	Switch on	3800	3600	4100	3700	3900	3800
	Switch off	4400	5000	4000	4300	4300	4700
AVANT 6000	Switch on	3600	4000	5000	4900	4300	3900
	Switch off	4600	4700	6500	6200	5100	5200
CAYENA 6001	Switch on	2900	2700	3000	2400	–	–
	Switch off	3100	3500	2800	3200	–	–
CAYENA 6001-C	Switch on	2300	2100	1900	2300	2600	2600
	Switch off	2600	2700	1400	2600	2700	3000
Cirrus 3001 Special	Switch on	3000	2700	2900	2500	–	–
	Switch off	3400	3200	2900	3000	–	–
Cirrus 3001 Compact	Switch on	3000	2600	2400	2600	–	–
	Switch off	2900	2900	1800	2600	–	–
Cirrus 3003-C	Switch on	2400	2200	2200	2400	2500	2300
	Switch off	2600	2800	1900	2200	3000	3300
Cirrus 4002	Switch on	2600	2500	2800	2600	–	–
	Switch off	2900	3100	2800	2900	–	–
Cirrus 6002	Switch on	2800	2600	2900	2700	–	–
	Switch off	3400	3600	3400	3800	–	–
Cirrus 6003-2	Switch on	3800	3500	3800	3400	–	–
	Switch off	3800	3700	3600	3700	–	–
Cirrus 6003-2C	Switch on	2500	2300	3000	2700	2700	2700
	Switch off	2800	2900	3100	3600	3400	3500
Citan 6000	Switch on	2600	2300	2700	2400	–	–
	Switch off	2800	3100	2500	2800	–	–
Citan 12000	Switch on	3200	3100	2000	2000	–	–
	Switch off	3600	3700	1600	1600	–	–

EDX: Section Control switches complete singling units or individual rows.

EDX singling unit	Switch on	1200
	Switch off	200
EDX single row control	Switch on	1160
	Switch off	600

The stated values are recommendations, they should be checked in every case.

Correction times for switch on / off delay times when overlapping / unworked areas

Forward speed [km/h]	Length of the overlapping (A) / Length of the unworked area (B)					
	0,5 m	1,0 m	1,5 m	2,0 m	2,5 m	3,0 m
5	360 ms	720 ms	1080 ms	1440 ms	1800 ms	2160 ms
6	300 ms	600 ms	900 ms	1200 ms	1500 ms	1800 ms
7	257 ms	514 ms	771 ms	1029 ms	1286 ms	1543 ms
8	225 ms	450 ms	675 ms	900 ms	1125 ms	1350 ms
9	200 ms	400 ms	600 ms	800 ms	1000 ms	1200 ms
10	180 ms	360 ms	540 ms	720 ms	900 ms	1080 ms
11	164 ms	327 ms	491 ms	655 ms	818 ms	982 ms
12	150 ms	300 ms	450 ms	600 ms	750 ms	900 ms
13	138 ms	277 ms	415 ms	554 ms	692 ms	831 ms
14	129 ms	257 ms	386 ms	514 ms	643 ms	771 ms
15	120 ms	240 ms	360 ms	480 ms	600 ms	720 ms

Correction times for speeds and distances (A, B) which are not listed can be interpolated / extrapolated or calculated using the following formula:

$$\text{Correction times for switch on / off delay times [ms]} = \frac{\text{Length [m]}}{\text{Tractor speed [km/h]}} \times 3600$$

The lead in/delay off times for seeding technology for switching on and off is influenced by the following factors:

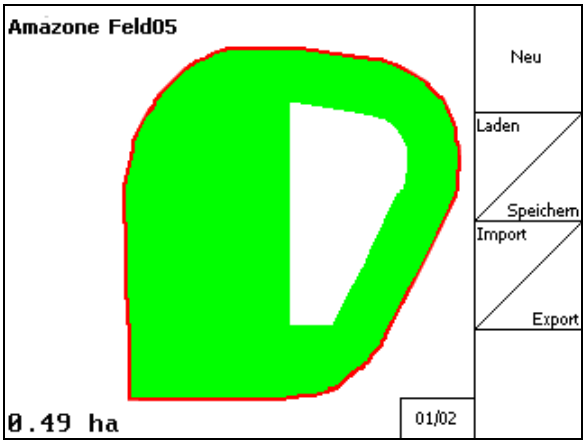
- Delivery times depending on the
  - Seed type
  - Delivery path
  - Blower speed
- Driving behaviour depending on the
  - Speed
  - Acceleration
  - Braking
- GPS accuracy depending on the
  - Correction signal
  - Update rate of the GPS receiver

For precise switching on the headland – particularly in the case of seed drills – the following points are essential:

- RTK precision of the GPS receiver (update rate min. 5 Hz)
- Even speed when driving onto and leaving the headland

10.3 Lot data menu

→ **Select** Schlagdaten **from the Main menu:**



- Neu New trace of a field a field.

→ White display indicates readiness for new trace a field.

Name of the field: -**unspecified-**.

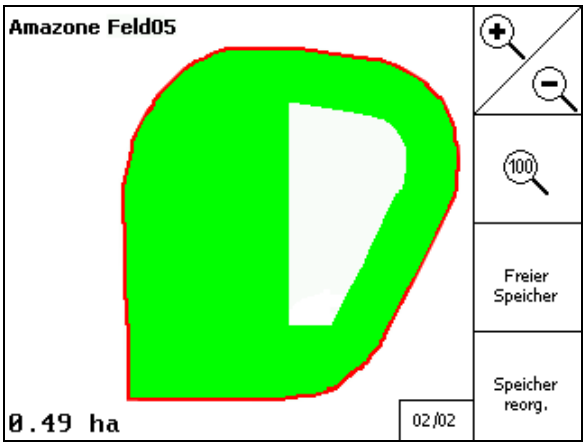
When the field is saved, the name of the field is assigned.

- Laden Load an existing field from USB stick, see page 65.
- **Speichern** Save a lot to a USB stick after work.

→ Enter name.

- Daten importieren Import shape files from USB stick, see page 67.
- **Export** Export the lot file in the shape (shp) format for use in other PC applications.

Page 2 02/02



- Increase field view
- Decrease field view
- Centre location
- Freier Speicher Display the available storage capacity of the USB stick.
- Speicher reorg. Optimise the memory of the USB stick if the available memory is not sufficient.

After 50 save procedures, the memory is optimised automatically.

→ Confirm message on the display.

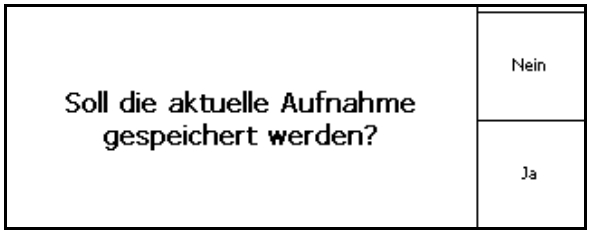
10.3.1 Loading/deleting lot data

The following field data can be called up:

- Loading the field border at the beginning of tilling the field.
- Worked area (field border with worked area of the field), if work has been interrupted and is now being resumed.
- Lead track for GPS-Track
- Obstacles
- Exclusion zones
- Application maps
- Headlands

→ Field data which cannot be called up are shown in grey.

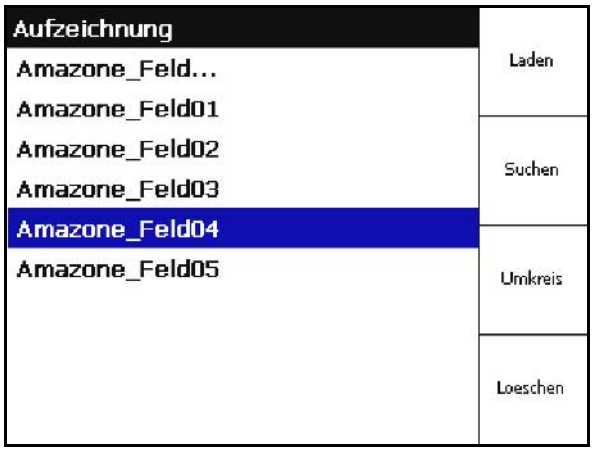
1. Insert the USB stick.
2. [Laden] Call up load submenu.
3. [Ja] / [Nein] Save the current area.



4.
   - o [Umkreis] Only fields in the set radius are displayed - see page 55.
   - o [Alle] Display all fields.
   - Select desired field

   or

   - o [Suchen] search for field after entering a text passage.



5. [Laden] Confirm selection.

6. , Mark the desired field attributes individually.
7. Select field attribute.

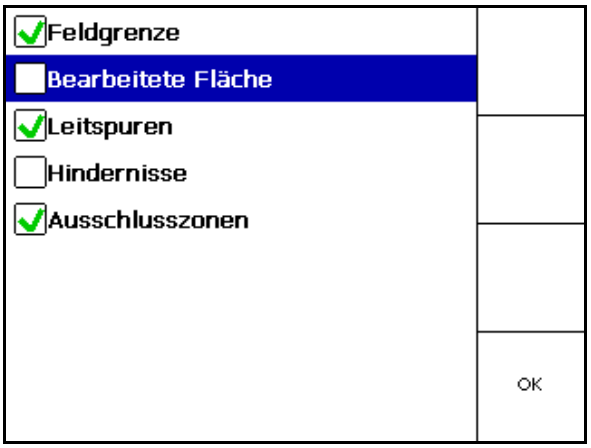
→ ☑

→ Grey field attributes cannot be selected.

8. OK Load field attribute.

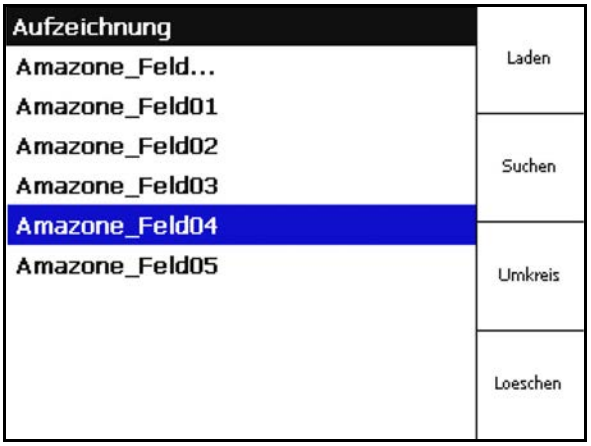
→ Selected field appears on the display.

9. Esc Back to main menu.



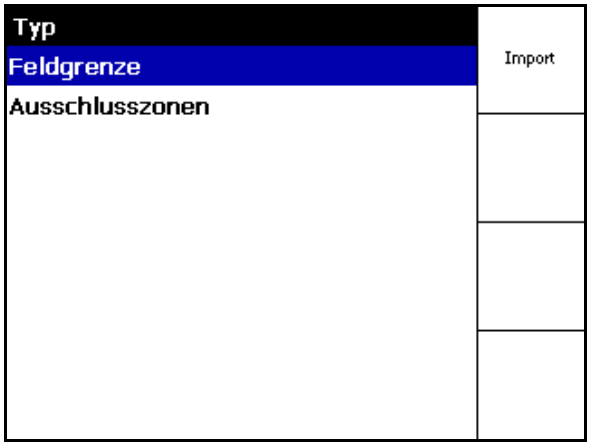
- Loeschen Delete a field on the USB stick

1. , Select desired field.
2. Press Ja / Nein.



10.3.2 GPS-Maps - Importing shape files

1. Insert the USB stick.
2. Import Open the Import data submenu.
3. , Select "Select desired content".
4. Import Confirm selection.



5. , Select the directory where the Shape file is located.

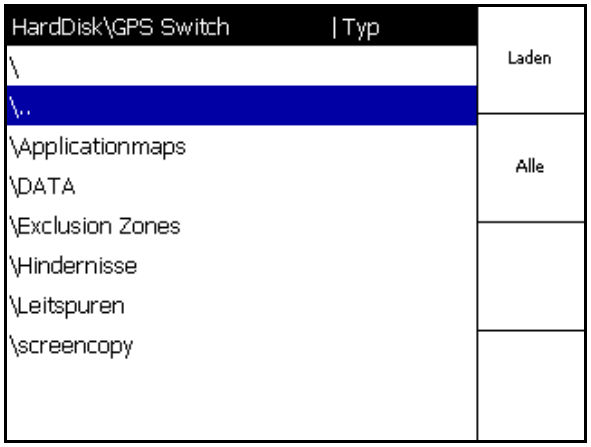
→ Change directory

\ Highest directory level

\.. One directory level higher

\xxx Change to this directory

6. Laden Shape file was saved to the current field.



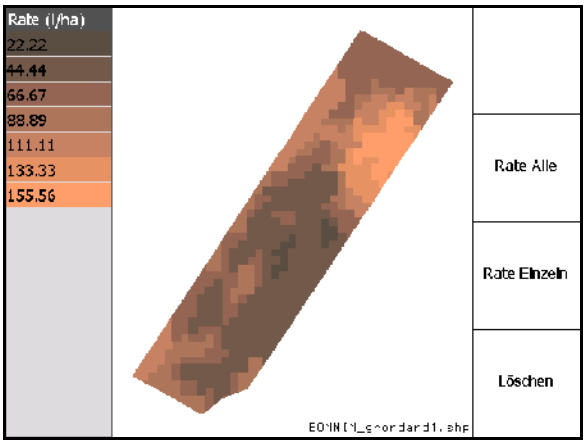
Import application maps

It is recommended that application maps are stored in the **applicationmaps** folder, the system accesses this folder directly during import.

Select the following when importing the application maps:

- Spray rate
- Proportion of active substance: kg or litre of active substance/ha (specify active substance in %)

→ In the application map, the spray rate is recomputed based on the proportion of active substance.



- Rate Alle Change all spray rates of the application map to the entered value in %.
- Rate Einzeln Select individual spray rate , and change it.
- Löschen Delete application map.

The imported application map is shown in the Work menu.

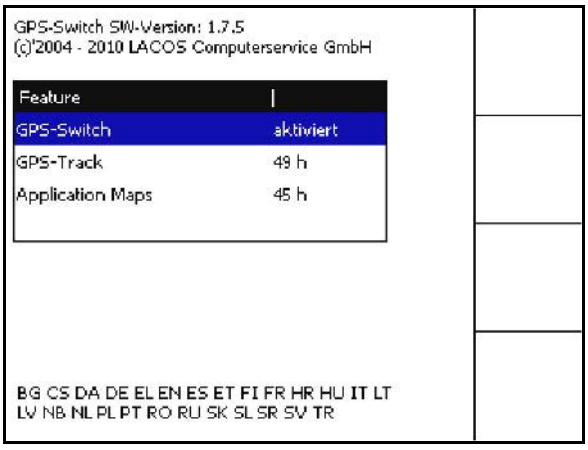
10.4 Info menu

→Select Info in the Main menu:

The available applications are displayed in the Info menu.

The following is displayed along with the applications:

- the remaining running time for test versions
- the activation for full versions



11 Use of the GPS switch application

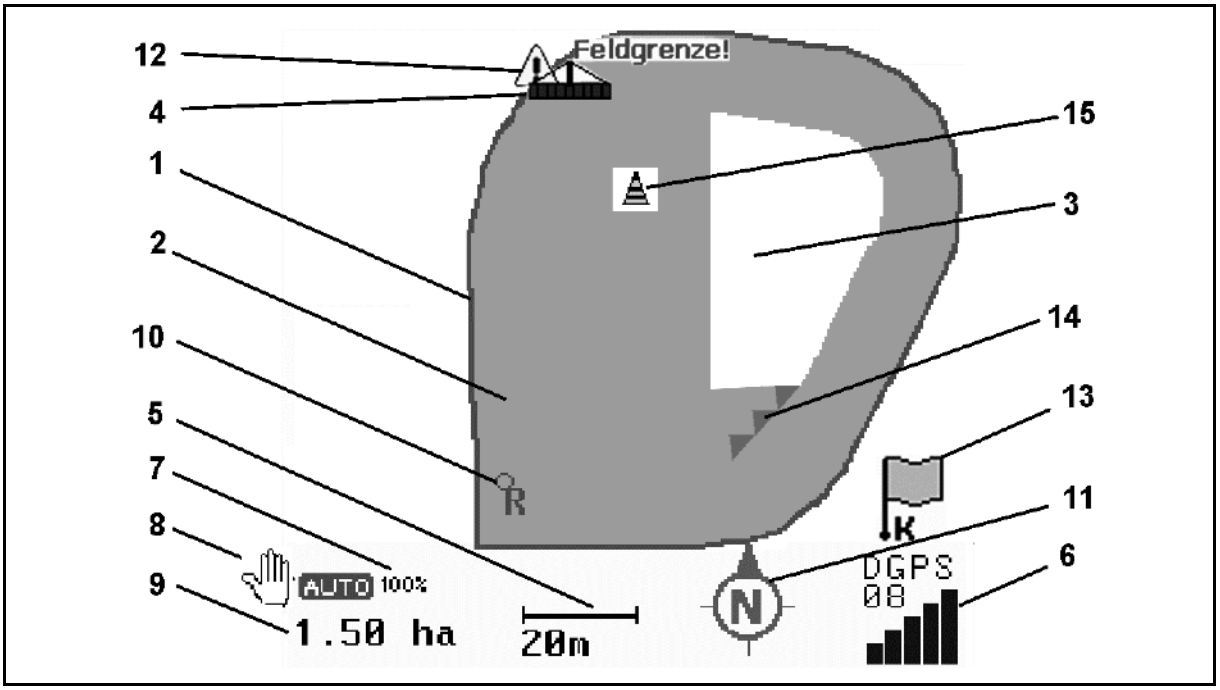
Before work can begin, the following information must be entered:

- Enter lot data (see page 55).
- Set machine geometry (page 55).
- Carry out setup configuration (page 55).

Depending on the working method, it may be useful to do the following:

- Always carry out a new trace of a field (see page 80)
- After a new trace of fields or field borders, save them to the USB stick and load them before tilling the field (see page 82).

11.1 Work menu display GPS-Switch



(1) Field border (red)
(2) Worked area (green)
(3) Unworked area (white)
(4) Symbol for implement
(5) Working width
(6) GPS signal strength
(7) Degree of overlap
(8) Automatic mode or manual mode
(9) Total area of the lot (within the field border)
(10) Reference point, point for calibration
(11) Compass
(12) "Machine at field border" warning
(13) Prompt to calibrate
(14) up to three overlaps (only for field sprayer)
(15) Inserted obstacle

Symbol for implement with part width sections in work menu.

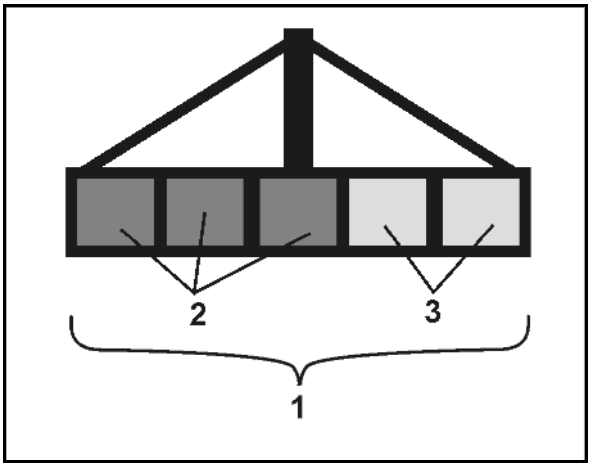
(1) Part width sections (grey – machine not in working position)

(2) Switched-on part width sections

- o blue

(3) Switched-off boom part width section

- o red



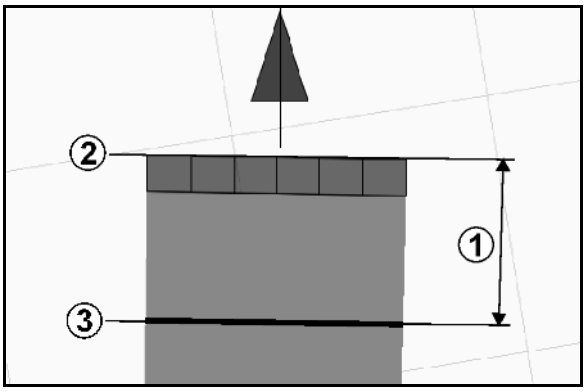
ISOBUS machine:

if the working length of the machine is transmitted, this is indicated with a black line.

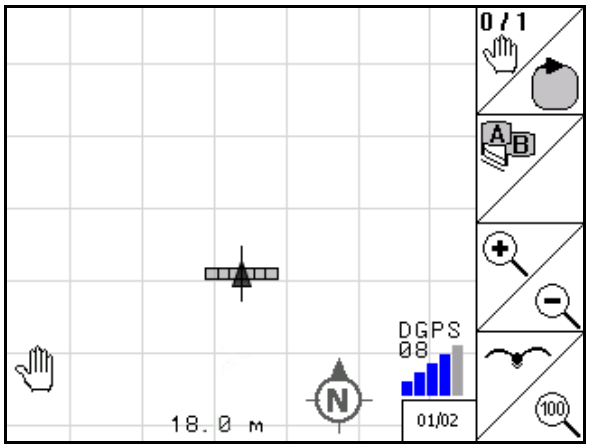
(1) Working length

(2,3) Switch-on / off point, depending on the machine setting

AMAZONE field sprayer: see ISOBUS operating manual, configure part width section.



11.2 Function fields in work menu GPS-Switch



-

Changeover between manual/automatic mode.

Confirm automatic mode within five seconds.

→ Manual/automatic mode is shown in the display.

-

Exception for manual device geometry (no automatic part width section control), see page 85.

-
Define field border (immediately after driving around the field the first time for new trace of a field).

-
Delete field border.

-
GPS track: Create GPS track guidelines

-
GPS track: Delete guidelines

-
Increase field view

-
Decrease field view

-
Display entire field

-

Centre location

Page 2 02/03

- Mark the obstacles on the field on the terminal, see page 79.
- Delete obstacle.
- Orientation of display
  - o Orientation with north towards the top
  - o Orientation with direction of travel towards the top
- Change display view 2D ⇔ 3D
- Set the reference point on the field for GPS signals or select an existing reference point from the list, see page 77.

→ Before a new trace of a field.

- Calibrate the field.

→ When working an already traced field.

- Switch to Setup menu, machine remains in automatic mode, see page 55 and page 89.

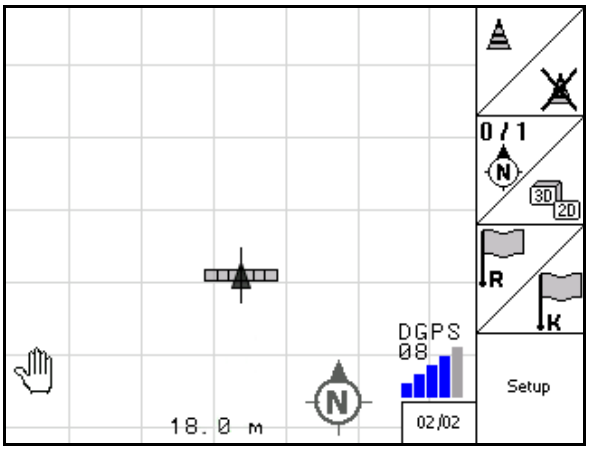


Fig. 4

11.2.1 Configurable headland / GPS headland

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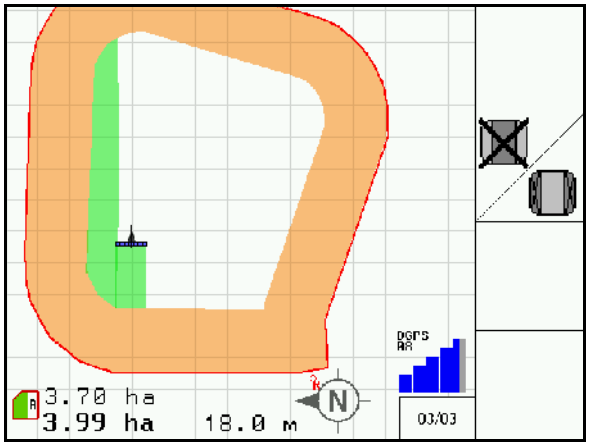
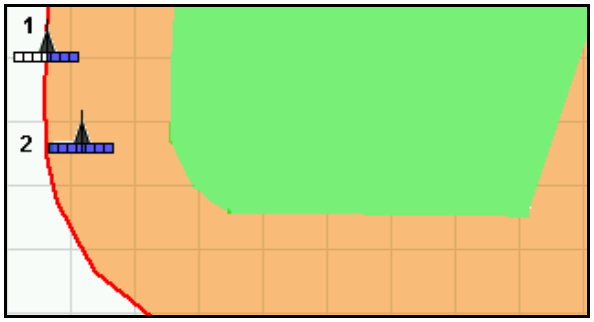


Configurable headland:

If a headland is configured before use, the inside of the field can initially be tilled in Automatic mode. Afterwards, the headland is tilled. Guide traces are created in the headland.

1. Create headland
   - o enter width of headland
   - o enter position of first guide track. Begin with half the working width (1) / full working width (2)?



→ orange headland– boom part width sections switch off at headland.

2. Till the inside of the field.
3. Activate headland

→ grey headland – headland tillable.

4. Till headland.

- Delete headland.
- Switch to till the inside of the field

11.3 Automatic mode and manual mode

The GPS switch application can be used both in manual and automatic mode.

In automatic mode, switching the part width sections is automatic both in the field and in the headland.

Automatic mode:

- Automatic switching on/off

Manual mode:

- No automatic boom section control.
- Operation of the machine via implement control, Joystick, AMACLICK
- Only display and marking on the terminal.

ISOBUS:

Section Control always starts in the mode in which it was exited.

Automatic mode remains after

- Switching on the control terminal,
- Starting a new job
- GPS failure

→ If necessary, operate Section Control through the implement software.

AMABUS:

Section Control always starts in manual mode.

Automatic mode

1. Move the implement into working position.
2. Select the GPS switch application.
3.

Select the GPS switch work menu.
4.

Select automatic mode.
5. Select implement control application.
6. ISOBUS: if necessary, set Section Control to automatic in the implement control.
7. If necessary, switch on the implement
8. Start up and begin work.

→ Part width sections are switched automatically.

→ **Worked area is shown in the GPS switch work menu.**

Manual mode

1. Move the implement into working position.
2. Select the GPS switch application.
3. Select the GPS switch work menu.
4. Select manual mode.
5. Select implement control application.
6. Switch the part width sections manually via the implement control.

→ **Worked area is shown in the GPS switch work menu.**

Conditions for working in automatic mode:

- The machine must be **prepared**:
  - Sprayer: boom extended and swing compensation unlocked.

    → Single-sided spraying with swing compensation is possible in manual mode only. .
  - Seed coulters must be in working position.
  - Spreader: the spreading discs must be switched on.
- The GPS signal must have sufficient quality:
  - GPS with HDOP </= 6
  - DGPS with HDOP </= 8

Switch individual boom part width sections using implement control and multi-function stick in Automatic mode

- possible (AMABUS field sprayer from software version 7.15)
- not possible (other machines).

Field sprayer:

- Switching off part width sections on the AMACLICK oversteers the GPS-Switch switch application.

  However, the area behind the part width sections switched off in this way remains marked in green.

→ As a result, an area that is oversteered manually is switched off automatically when driving over the next time.

- Selecting individual part width sections on the implement control is possible in automatic mode.

  In doing so, part width sections that are disengaged on the outside are also switched off at all times in the GPS-Switch, and this area is not marked in green.

→ This provides the ability, for example, to disable the 2 outer part width sections for a 27m sprayer at all times and thus to till a lot using 21m tramlines.

Switching off the sprayer/switching off the spreader disc drive of the fertiliser spreader on the implement control is also possible in automatic mode.

Exiting the work menu, malfunctions or a poor GPS signal cause the GPS-Switch to switch to manual mode.

→ Sprayer: Close part width sections.
→ Spreader: Close shutter.

CAUTION

There is a risk of unintentional spreading of spray liquid/spreading of fertiliser when reversing in automatic mode due to automatic switching of the part width sections.

The GPS-Switch functions properly in the direction of travel only. Therefore, for safety reasons, switch the GPS-Switch to manual mode for shunting, particularly in combination with reversing.

Alternatively on the implement control:

- Field sprayer - switch off sprayers
- Fertiliser spreader - close shutters,

11.4 The reference point

The reference point is the reference of the GPS signal to the position of the field.

The reference point:

- must be set before saving a field / or use an existing one.
- should be calibrated when requested or if a deviation from the terminal for the field has been detected.

The reference point:

- is the point on the field above which the GPS receiver on the tractor is located.
- Must be approached using the tractor and recorded with the vehicle at a standstill
- Serves to calibrate the location for the GPS signal.
- is an arbitrary point which can be found again. This point must be on or in the immediate vicinity of the field to be tilled.

  (e.g. drive until front tractor wheel makes contact with a border stone).
- Must be noted for later work cycles when saving the field border.

Be careful and thorough when defining the reference point.

At each calibration, approach the reference point in the same way from the same direction.

The existence of a correction signal is recommended for setting and calibrating the reference point.

If a warning appears before an imprecise reference point do not set it.

If the position of the GPS antenna has changed after being refitted on another tractor, the reference point must be reset.

→ In this case, calibration is not sufficient.

11.4.1 Incorrect calibration

Incorrectly calibrated data cannot be used.

Should you have inadvertently carried out a calibration at a wrong location, it is possible to drive to the correct location and repeat the calibration.

11.4.2 Assign new reference point

The following procedure is needed to set a new reference point:

1. Loading the field
2. Calibrating the field

→ Now you can set a new reference point or select one from the list

11.4.3 Using RTK-GPS

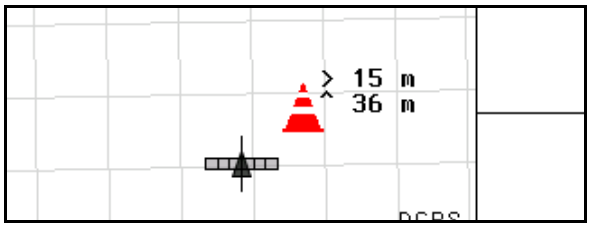
This procedure presupposes use of an RTK station.

A reference point should also be set when using an RTK station as this makes a calibration of the field possible when the RTK signal fails.

- Processing the GPS data when setting or calibrating the reference point takes approximately 15 seconds and is indicated on the display.
- Confirm the reference point.

11.5 Marking of obstacles

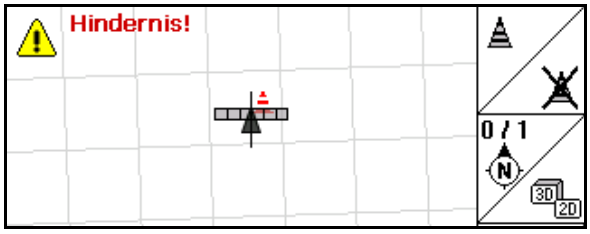
Obstacles on the field can be marked on the terminal



1. Insert obstacle.
2. Displace obstacle.

→ The position of the obstacle in relation to the GPS antenna is displayed.

3. Confirm position
4. Delete the obstacles within a circumference of 30 metres.



Before reaching the obstacles, an acoustic and visual warning is released.

11.6 Procedure for new trace of the field

If the headland is usually treated at the beginning of the field-work:

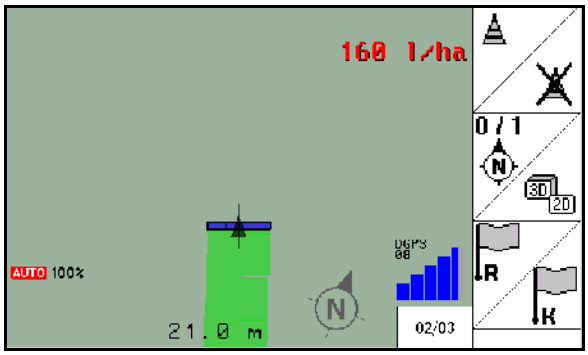
→ Always carry out a new trace of the field.

→ Carry out the first drive around the field in manual mode.

→ Field sprayer: The first drive around the field can also be carried out in Automatic mode.

For this purpose, switch the spraying on and off manually also in Automatic mode when manoeuvring and reversing.

Before new trace: Display without field/field border.



1. Switch on the AMATRON 3.

→ After approximately 30 seconds, the AMATRON 3 receives DGPS signals.

2. Select GPS application.
3. Schlagdaten Select the Lot data menu.
4. Neu New trace of a field.

→ Field **-unspecified-** created.

5. Esc Back to main menu.
6. Esc Select the work menu.
7. Set / load the reference point when wishing to save the field / field boundary.

   o R drive to the reference point and set, or

   o R select the reference point from the list.

- The reference point must be set / loaded if the newly traced field is to be saved.
- The reference point should be set / loaded, if the fields are large fields with correspondingly long working time, as only this way is it possible to calibrate the field.

→ This makes it possible to avoid inaccuracies due to satellite drift.

→ Perform the first field perimeter drive, see Page 74.

After driving around the complete field perimeter:

8. Stop.
9. Determine the field border.

→ The field border is displayed.

10. Till the inside of the field.

→ The part width sections are switched automatically.

→ After the entire field has been covered, all part width sections are disengaged automatically.

11. Switch between the GPS and implement control applications were necessary.

After use:

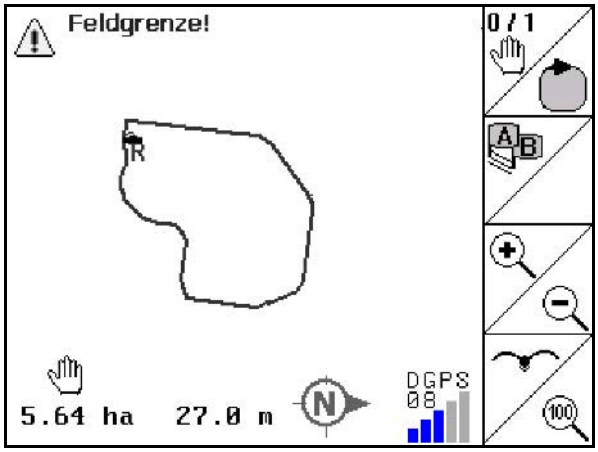
1. **Implement control**: Switch off machine.
2. **If necessary:** Save lot data to USB stick (see page 65).
3. Switch off the AMATRON 3.

11.7 Procedure for loading a field border / a field

→ Driving around the field is possible in automatic mode.

For this purpose, switch the spraying on and off manually also in Automatic mode when manoeuvring and reversing.

Stored/loaded field border



1. Switch on the AMATRON 3.

→ After approximately 30 seconds, the AMATRON 3 receives DGPS signals.

2. Select GPS application.
3. Load field border / field via Lot data menu (see page 65).
4. Esc Back to main menu.
5. Esc Select the work menu.
6. Drive to the reference point.
7. Calibrate the field and remain in place for 15 seconds.
8. 0/1 Set the GPS-Switch to **auto**, see page 74.
9. Select implement control application.

→ Work the field in automatic mode.

After use:

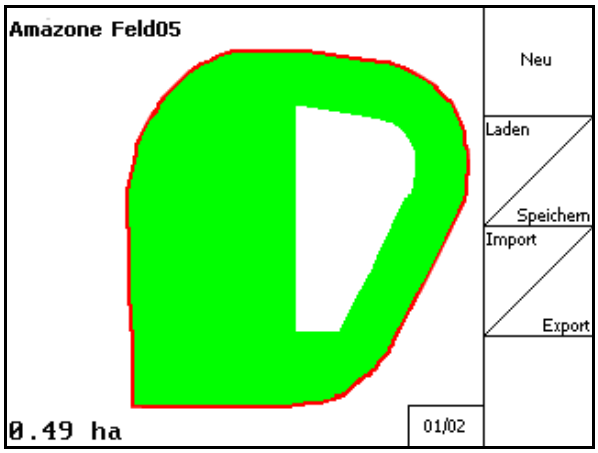
1. **When interrupting work:** Save lot data to USB stick (see page 65).
2. **Implement control**: Switch off machine..
3. Switch off the AMATRON 3.

11.8 Interrupting the work

When interrupting field work / switching of the operating terminal, pay attention to the following:

- The reference point should be set.
- After the on-board computer is switched on again, the tilling status of the field appears in the working display and work can resume.
- Saving the field to a USB stick is necessary if tilling another field after the interruption and before resuming work.

Field loaded after interrupting the work.

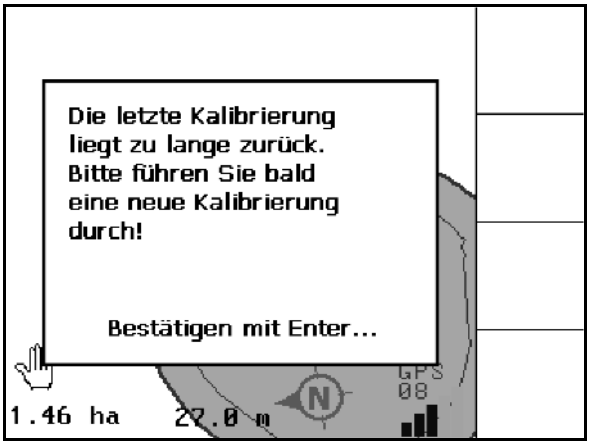


11.9 During the work

Before reaching the field boundary, an acoustic and visual warning is released.

If a reference point has been set:

Carry out a new calibration as soon as possible if the last calibration was four hours ago and the GPS-Switch prompts you to do so.



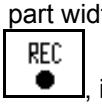
11.10 REC for manual device geometry

For machines without automatic part width section control

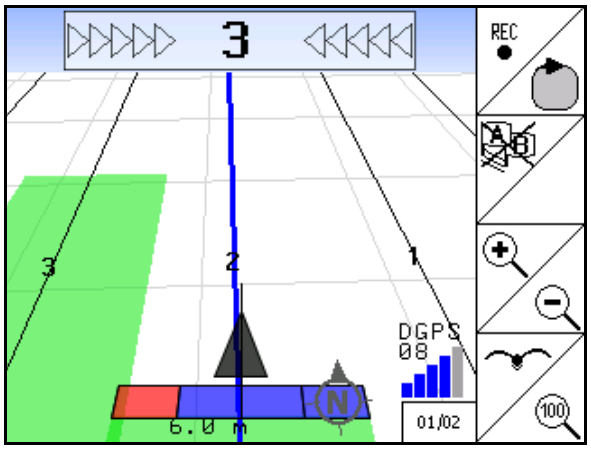
1. Switch on the boom part width sections manually on the machine.

and simultaneously

2.

Begin with the recording of the worked field.
3. Every time boom part width sections are switched off with 

, interrupt the recording at the same time.



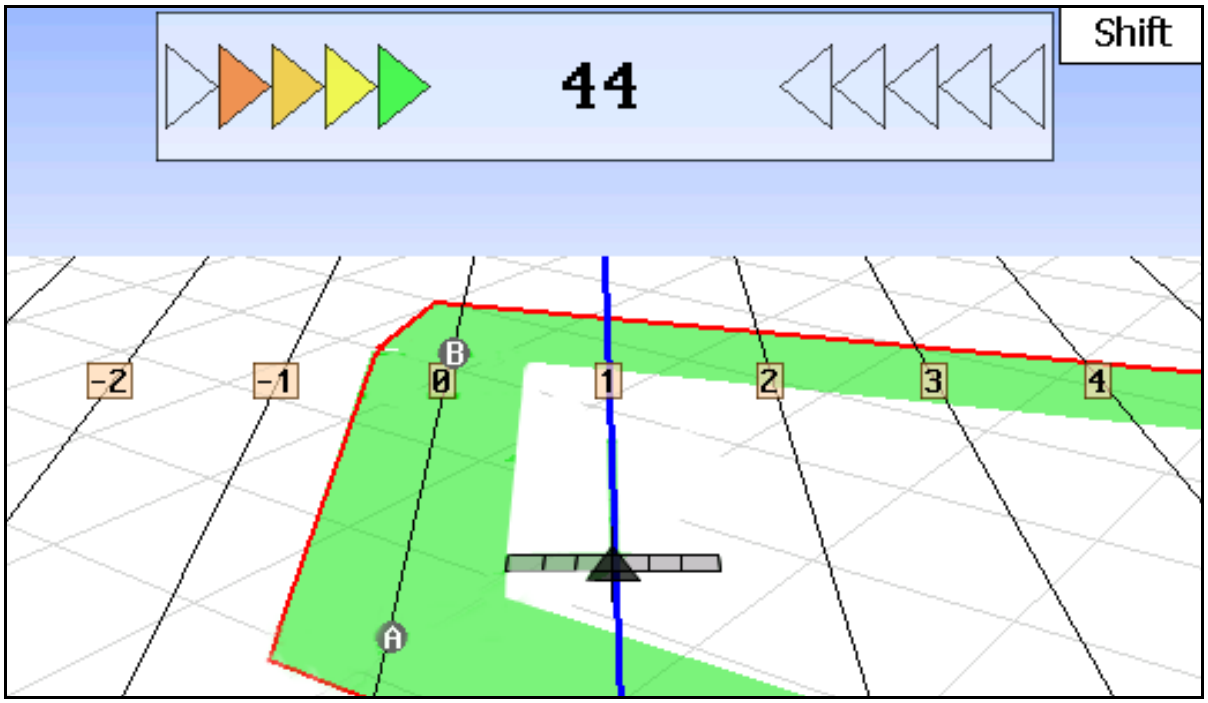
Once the field borders have been recorded by driving around the perimeter, the field borders can be created and saved in the terminal, and used for machines with automatic part width section control.

12 GPS track application

12.1 Function

GPS track is an application for track guidance on the field. Parallel to the first lead track, other lead tracks are laid.
The lead tracks are shown on the terminal.
The light bar shows the deviation of the tractor from the lead track and thereby enables an exact travelling along the lead tracks.

12.2 GPS Track im Arbeitsmenü



(1) Numbered lead tracks
(2) Active lead track (blue)
(3) Following lead track
(4) Light bar for finding the lead track
(5) Distance from the lead track in cm
(A) Starting point for creating the lead tracks
(B) Terminal point for creating the lead tracks

12.3 Use of the GPS track

1. Setup GPS switch:
   - o Select guide pattern, see page **89**.
   - o Enter beds, see page 90.
   - o Enter lead track spacing, see page 89.
2. Make lead tracks during the first run on the guideline, see page 88.

→ The lead tracks made are displayed in the selected guide pattern.

3. Search for the next numbered lead track.

→ When the lead track is reached, it is marked in blue.

4. Drive down the lead track.

→ Observe the light bar in the process.

5. When travelling the first time, register the obstacles present, see page 79.

12.4 Creating lead tracks

12.4.1 Lead tracks via AB guide pattern or identical

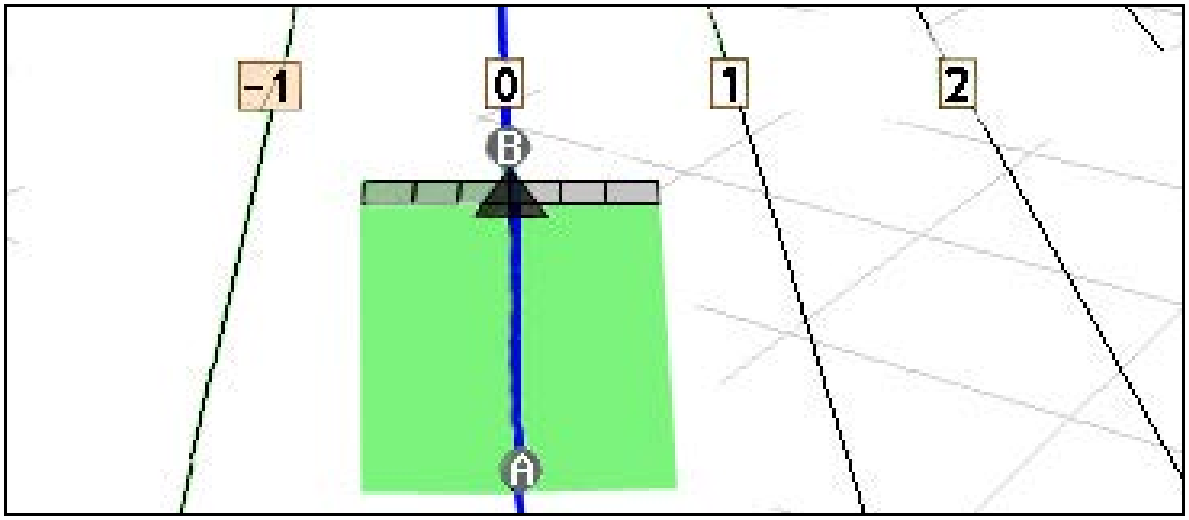
Before creating lead tracks, the following steps have to be carried out in the Setup menu, see page 89:

- Select guide pattern
- Drive on beds
- Lead track spacing

1. Establish starting point A to create the lead tracks.
2. Make the run to create the lead tracks.
3. Establish stopping point B to create the lead tracks.

→ The lead tracks are calculated and displayed on the terminal.

4. Delete the lead tracks.



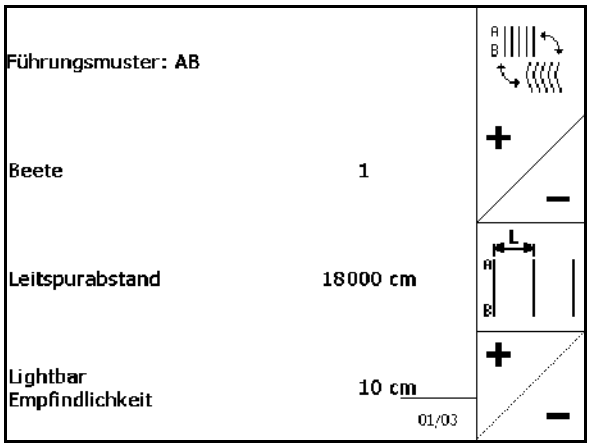
12.4.2 Lead tracks via A+ guide pattern

1. Establish starting point A to create the lead tracks.
2. Enter the angle for the course of the lead tracks.

→ The lead tracks are calculated and displayed on the terminal.

12.5 Setup GPS switch (GPS track)

In the Work menu: Setup.



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- o Straight connection line guide pattern or any contour between points A and B.
- o , Beds.
- o Lead track spacing
  The working width of the implement as standard. To ensure an overlapping, the value can be somewhat reduced.
- o , Set the sensitivity of the light bar in cm.

→ 02/03, 03/03, see page 55.

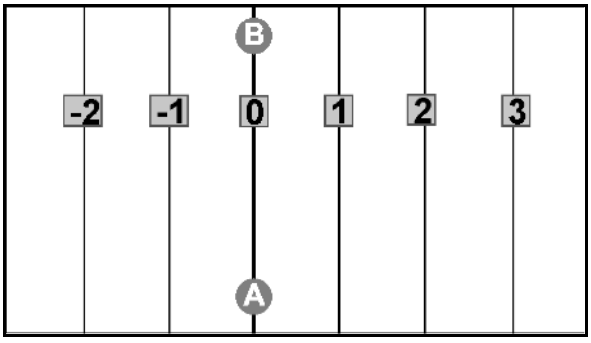
12.5.1 Guide pattern

GPS track makes possible the creation of various guide patterns.

Parallel travel

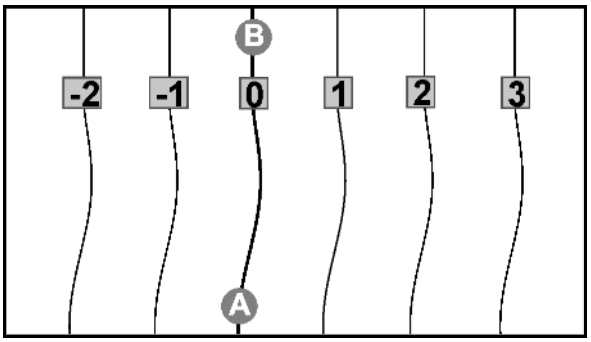
The lead tracks are parallel lines:

- AB → The lead tracks are straight, parallel lines to connect the set points A and B.
- A+ → The lead tracks are straight, parallel lines established by points A and B. and an angle in which the lead tracks should run.

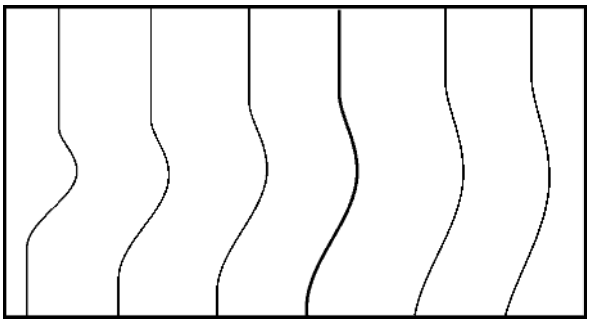


Contour travel

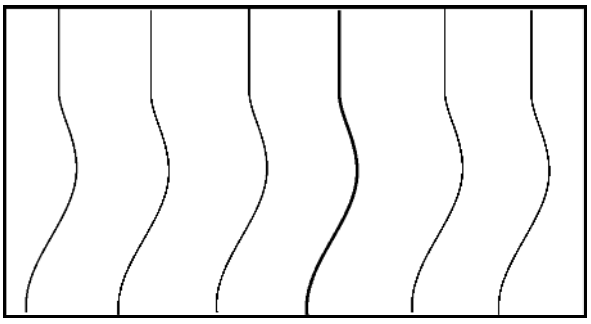
The lead tracks are random contours.



- Smoothed contour → The lead tracks contain curves where the radius of the first lead track is adjusted accordingly. Next to the inner curve, the radius gets smaller; next to the outer curve, the radius gets larger.



- Identical contour → The lead tracks contain curves where all lead tracks correspond with the first lead track.



12.5.2 Travel beds

When travelling the beds, one lead track is not travelled after the other, but one or more lead tracks are left out and worked later.

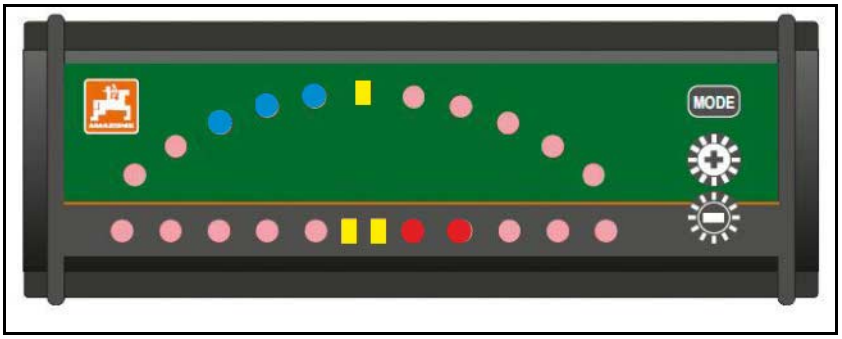
Thus, the adjacent lead track can be avoided when manoeuvring.

The lead track interval is to be entered.

12.6 Light bar

The light bar shows the track being followed.

- The lower LED strip shows the deviation from the guide track to the left or to the right.
- The upper LED strip shows the required steering angle to return to the guide track.
- If only the yellow LEDs are lit, the implement is on the guide track.



The light bar is set to a baud rate of 19,200 as standard. The AMATRON 3 and the GPS receiver must be set to the same baud rate as the light bar.

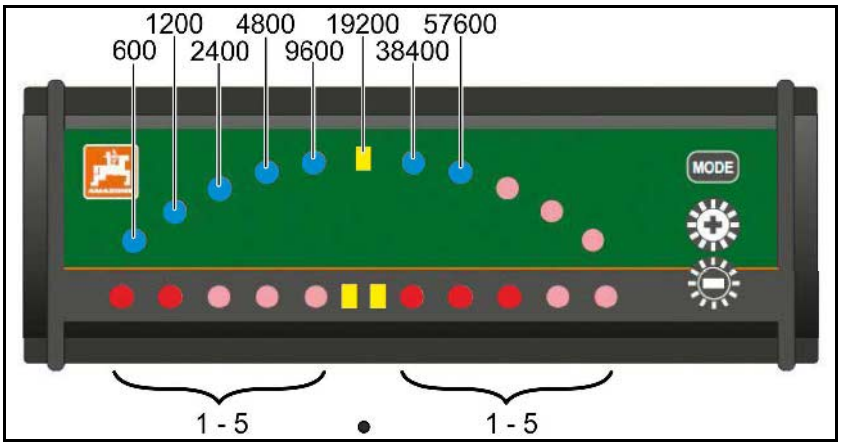
The baud rate of the light bar can be adjusted in the Configuration menu.

The upper LED strip shows the baud rate in the configuration menu.

→ Baud rates (600 to 57,600) rising from the left.

The lower LED strip shows the software version in the Configuration menu.

→ Software version: x.x (x = 1-5 illuminated LEDs).



- Calling up the configuration menu: Press and hold MODE and turn on the AMATRON 3.
- + /- Change the baud rate in the Configuration menu.
- To exit the Configuration menu: Turn the AMATRON 3 on again.

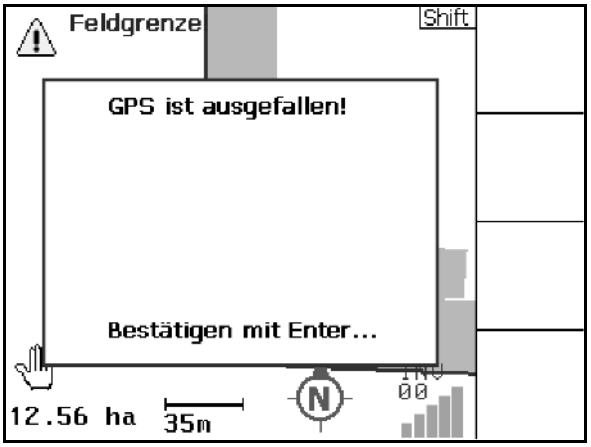
13 Fault

Fertiliser spreader	
The GPS switch switches	**Task Controller – implement geometry:**
• off too early in direction of travel	→ Increase GPS X1-value
• off too late in direction of travel	→ Reduce GPS X1-value
• on too early in direction of travel	→ Increase headland distance V
• on too late in direction of travel	→ Reduce headland distance V
Example:	
Problem:	Solution:
Fertiliser spreader switches off 5m too early, current GPS X1-value -3000.	GPS X1-value: increase to -8000. → Fertiliser spreader switches off correctly, but now switches on too late. Solution: Reduce headland distance V by 5000.
• transverse to direction of travel, incorrectly	**TECU:**
	→ Value A wrong
	→ incorrect prefix
Strips forming between the tracks	→ Tramlines incorrect
	→ GPS drift, calibrate reference point.
No reception:	
Call up GPS diagnosis menu.	
Data available ? No	• Check connections of antenna / external GPS. • Lamp on antenna lights up? (Red: Power, Orange: GPS, Green: DGPS) • Check external GPS unit. Settings 19200 baud, 8 data bits, Parity: none, 1 stop bit
Data available ? Yes ->	• Check external unit NMEA data records. GGA, VTG, GSA, 5Hz • Check GPS quality. Is the GPS signal too poor? See list of signal requirements.
AMATRON 3 cannot be switched on	
AMATRON 3 switched on and off too fast.	• Wait a few seconds and switch on again. • Pull out 9-pin connector of basic equipment and reconnect.
The GPS switch does not switch correctly (mostly too late).	• Check external GPS. Are GGA, VTG and GSA transmitted with 5Hz?

Machines - Symbol does not move during travel, but is shown and responds to switching on and off (blue/red/grey).	• Check external GPS. Are GGA, VTG and GSA transmitted with 5Hz?
Fault message: Creation of a field border not possible. → Field border already exists. It was forgotten to create a new lot. The lot can be made visible via the bird's perspective.	• Create a new lot, go round again (if necessary without spraying/spreading), then determine field border.
The GPS switch does not respond to the machine.	Is the correct implement set in the TaskController? • Does the implement have the correct software? → Spreaders: as of version 2.31 → Sprayers: as of version 7.06.01/02m → Seed drills: as of version 6.04 / 2.22 • TECU from the tractor? → No? Setup Terminal: Enter/activate tractor TECU (simulated). • Start job.
One or more part width sections in the AMATRON 3 do not respond to the GPS switch, or vice versa.	• Check whether the number of part width sections in the GPS switch corresponds to those in the AMATRON 3.
Individual part width sections switch too early or too late	• Check whether the width of the individual part width sections in the GPS switch corresponds to those in the job computer.
The field border is displaced after loading.	• Calibrate the reference point. Is the field border still displaced? • Reference point not found / driven to exactly.
GPS switch does not respond, or responds incorrectly.	• Pull out 9-pin connector of basic equipment and reconnect. • Switch on the GPS switch • Create a new field! • Do not store the old field!

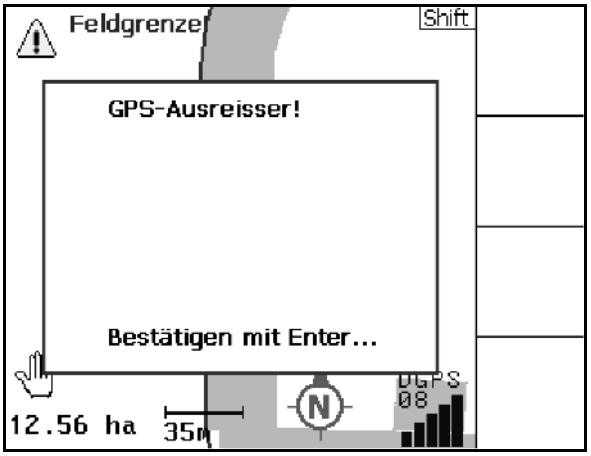
If the GPS-Switch does not receive a GPS signal, this is indicated in the display.

→ The GPS-Switch switches from automatic to manual mode.



If the GPS-Switch identifies a signal as an outlier, this is indicated in the display.

→ The GPS-Switch switches from automatic to manual mode.

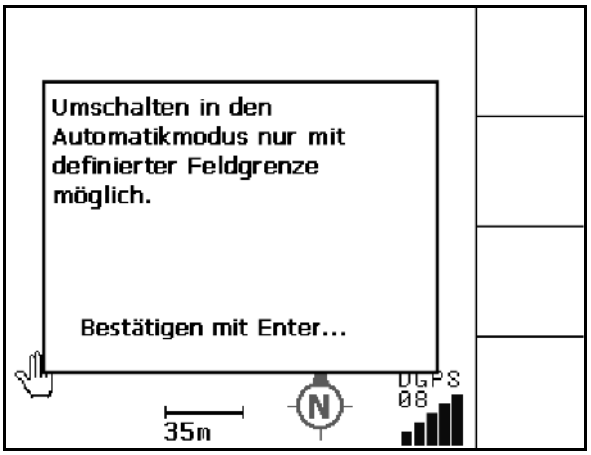


A switch to automatic mode is possible only with defined field border.

→ Define the field border in manual mode.

Or:

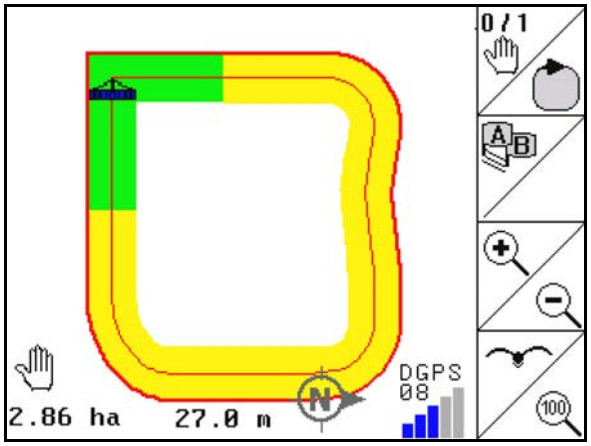
→ Load field border.



Poor GPS signal while driving around the field for the first time:

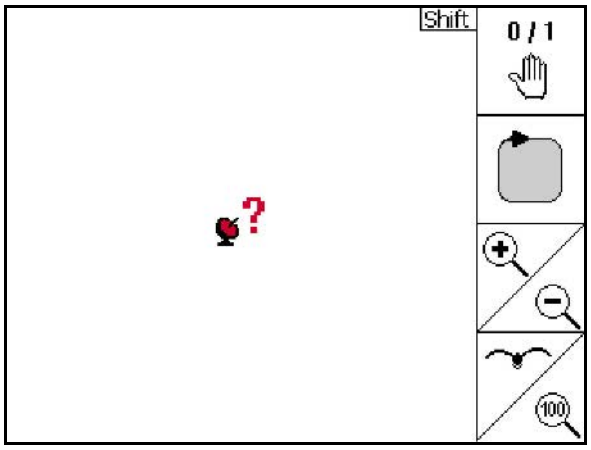
- The area in which work was carried out with a poor GPS signal is marked in yellow.

→ The safety zone is increased.



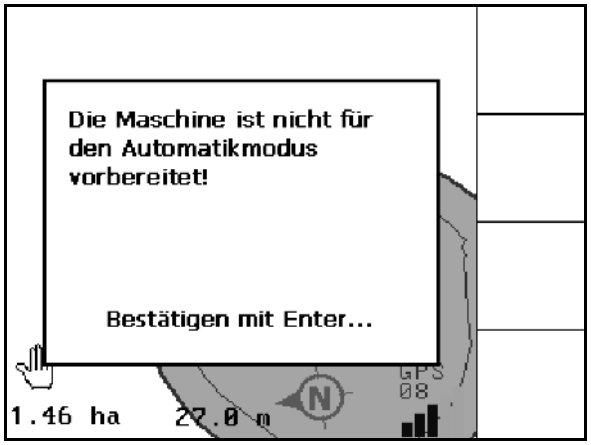
No GPS signal present.

→ Display of the field is not possible.



Machine not prepared:

- Spreader disc drive not switched on?
- Sprayer boom not unlocked?



14 Maintenance

14.1 USB stick data management

The USB stick contains two folders for storing the data:

- Data

  Three files with all stored fields and field borders.

→ "Data" folder for storage on computer, if memory of the USB stick is full.

- GPS-Switch Export

  Shape data for GIS program.

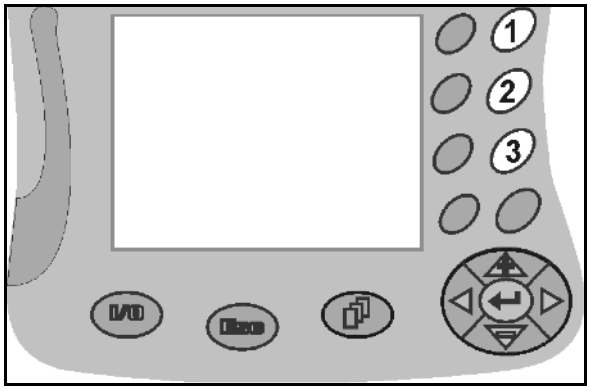
14.2 Carrying out a software update

On the PC:

3. Decompress the zip file.
4. Copy the data to the main directory of the USB stick.

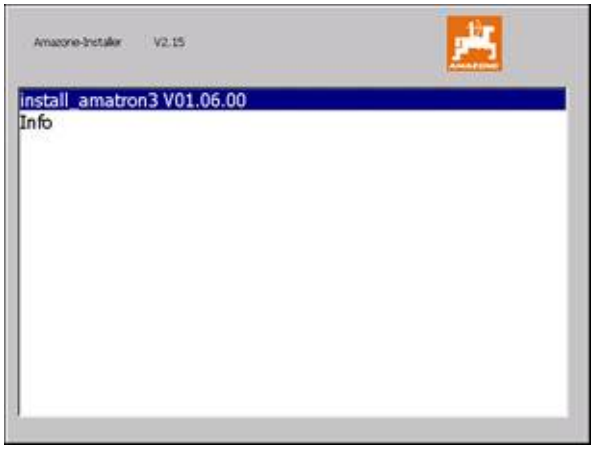
- Any files that are already on the stick can remain there.

5. Insert the stick into the switched-off AMATRON 3.
6. Press Esc and hold, ⏻ Switch on the AMATRON 3.
7. Press buttons 1, 2, 3 in sequence.



→ The following appears on the display.

8. ↵ to confirm.



→ The new software is installed automatically.

The installation is complete as soon as the AMAZONE logo appears.

9. Remove the stick and delete the five files from the computer.
10. ⏻ Switch off the AMATRON 3.
11. ⏻ Switch the AMATRON 3 back on.

14.3 Storage

Store the on-board computer in a dry place when you remove it from the tractor cab.

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Manufacturers of mineral fertiliser spreaders, field sprayers, seed drills, soil cultivation machines, and communal units