



Control terminal

AMATRON 3

This operating manual is valid from software version: 01.09.00



AMAZONE

Original operating instructions

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About this operating manual

1

CMS-T-006637-B.1

1.1

Other applicable documents

CMS-T-00000217-A.1

- Operating manual for the GPS receiver
- Operating manual for the implement software

1.2

Validity

CMS-T-006632-A.1

These operating instructions are valid for software version 01.09.00

For information on the software version: *"Setup"* > *"Diagnosis"* > *"Software versions"*

1.3

Diagrams

CMS-T-00000320-B.1

1.3.1 Notes

CMS-T-00000174-A.1



NOTE

Indicates practical tips and instructions that will help you to make optimal use of all the functions of your implement.

1.3.2 Instructions

CMS-T-00000473-B.1

Numbered instructions

CMS-T-005217-B.1

Actions that have to be performed in a specific sequence are represented as numbered instructions. The specified sequence of the actions must be observed.

Example:

1. Instruction 1
2. Instruction 2

1.3.2.1 Instructions and responses

CMS-T-005678-B.1

Reactions to instructions are marked with an arrow.

Example:

1. Instruction 1
- ➔ Reaction to instruction 1
2. Instruction 2

1.3.2.2 Alternative instructions

CMS-T-00000110-B.1

Alternative instructions are introduced with the word "or".

Example:

1. Instruction 1
- or
- Alternative instruction
2. Instruction 2

Instructions with only one action

CMS-T-005211-C.1

Instructions with only one action are not numbered, but rather shown with a arrow.

Example:

- ▶ Instruction

Instructions without sequence

CMS-T-005214-C.1

Instructions that do not require a specific sequence are shown as a list with arrows.

Example:

- ▶ Instruction
- ▶ Instruction
- ▶ Instruction

1.3.3 Lists

CMS-T-001852-A.1

Lists are used, for example, to show different selection options. Entries in lists are introduced with points.

Example:

- Entry 1
- Entry 2
- Entry 3

1.3.4 Item numbers

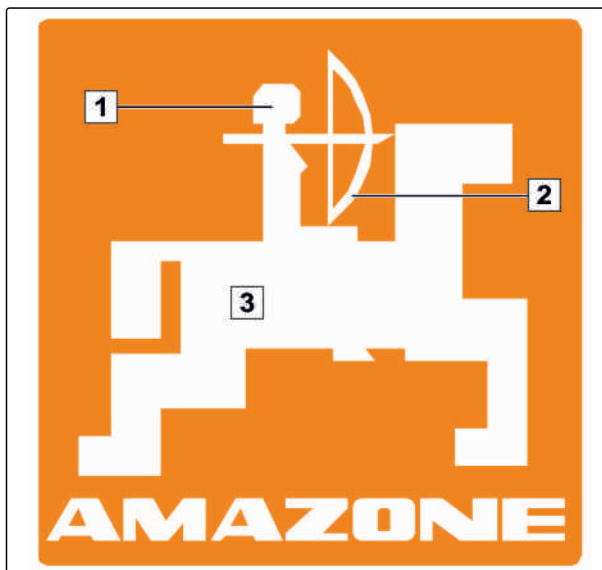
CMS-T-001857-A.1

Item numbers in the text or in the legend refer to item numbers in figures located beside or above the text. The item numbers in the figures can be connected with item lines.

1 Item 1

2 Item 2

3 Item 3



1.3.5 Orientation paths

CMS-T-00000021-A.1

Orientation paths located at the beginning of text sections with instructions for action help with rapid orientation, especially for selective reading relating to problems Example: "*Setup*" > "*Diagnosis*" > "*Software versions*"

Installation instructions

2

CMS-T-00004668-A.1

2.1

Basic installation

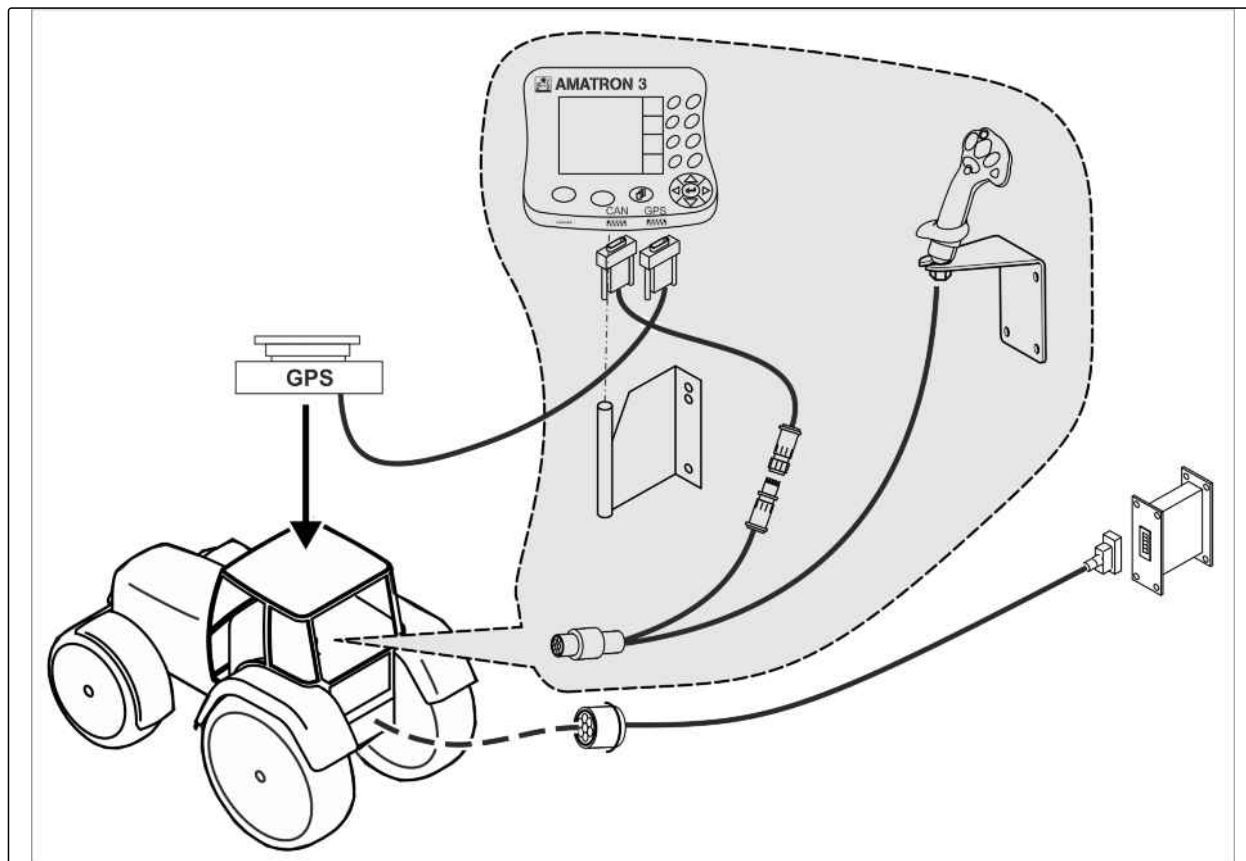
CMS-T-006367-B.1

1. Mount the GPS receiver on the tractor, please refer to the operating manual for the GPS receiver.
2. *The AMATRON 3 control terminal can be connected to the tractor basic equipment or with the ISOBUS wiring.*
The tractor basic equipment (console with distributor) must be mounted in the cab, vibration-free and with a conductive connection, to the right of the driver within his view and reach. The distance from the radio unit or antenna must be at least 1 m.
3. The paint must be removed from the installation points in order to prevent electrostatic charge.

2.2

Mounting for ISOBUS mode

CMS-T-006370-A.1



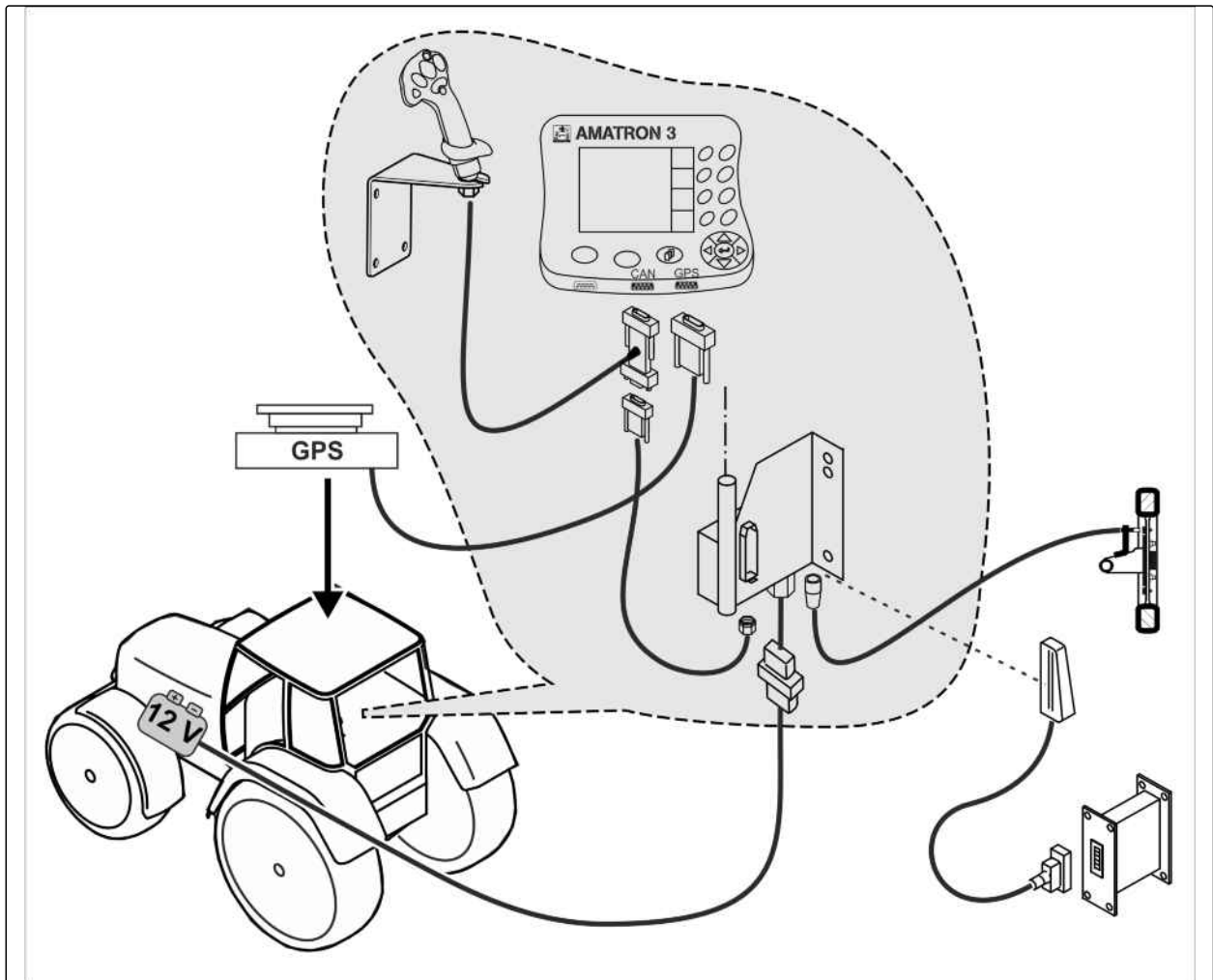
CMS-I-001583

- *For implements that are connected to an ISOBUS tractor using the ISOBUS light cabling:*
Disable the ISOBUS function of the tractor terminal.

2.3

Mounting for AMABUS mode

CMS-T-006473-B.1



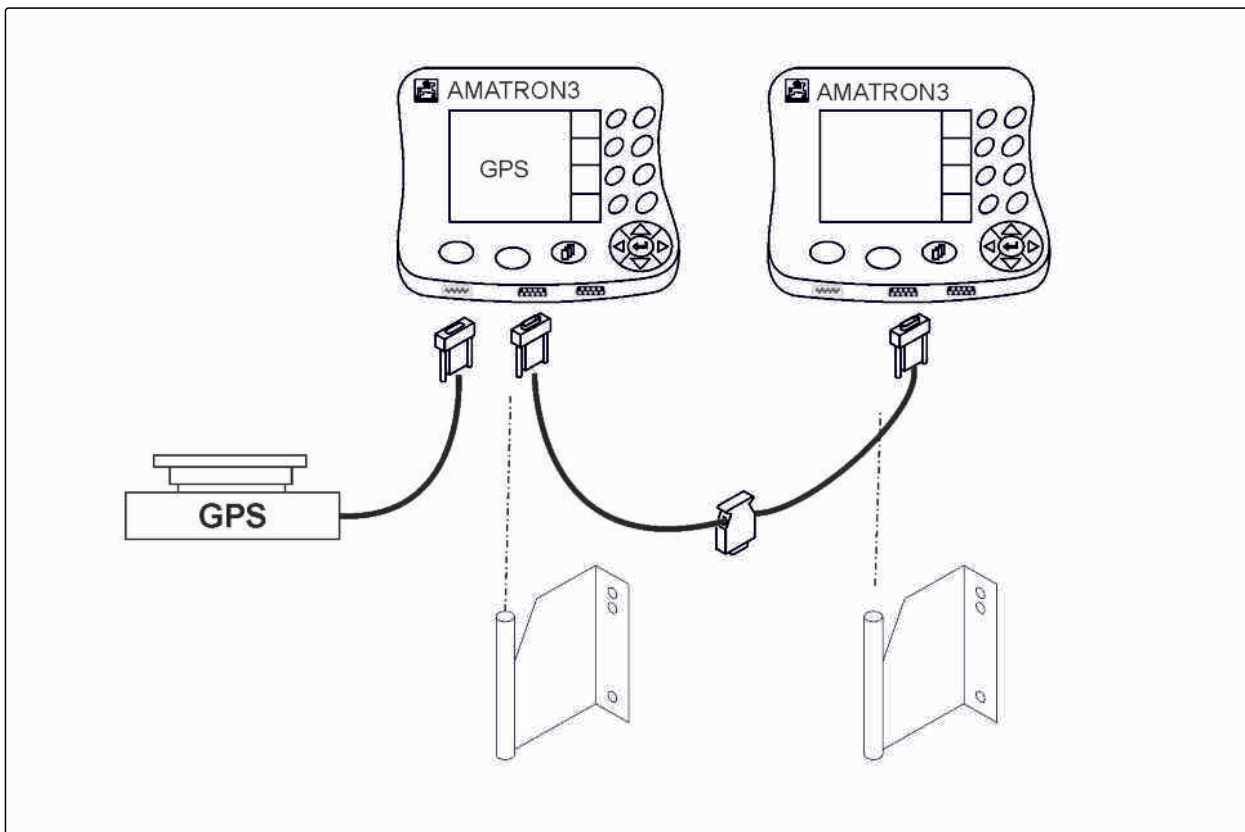
CMS-I-001582



2.4

Mounting for parallel operation

CMS-T-006476-B.1



CMS-I-002303



AMATRON 3 overview

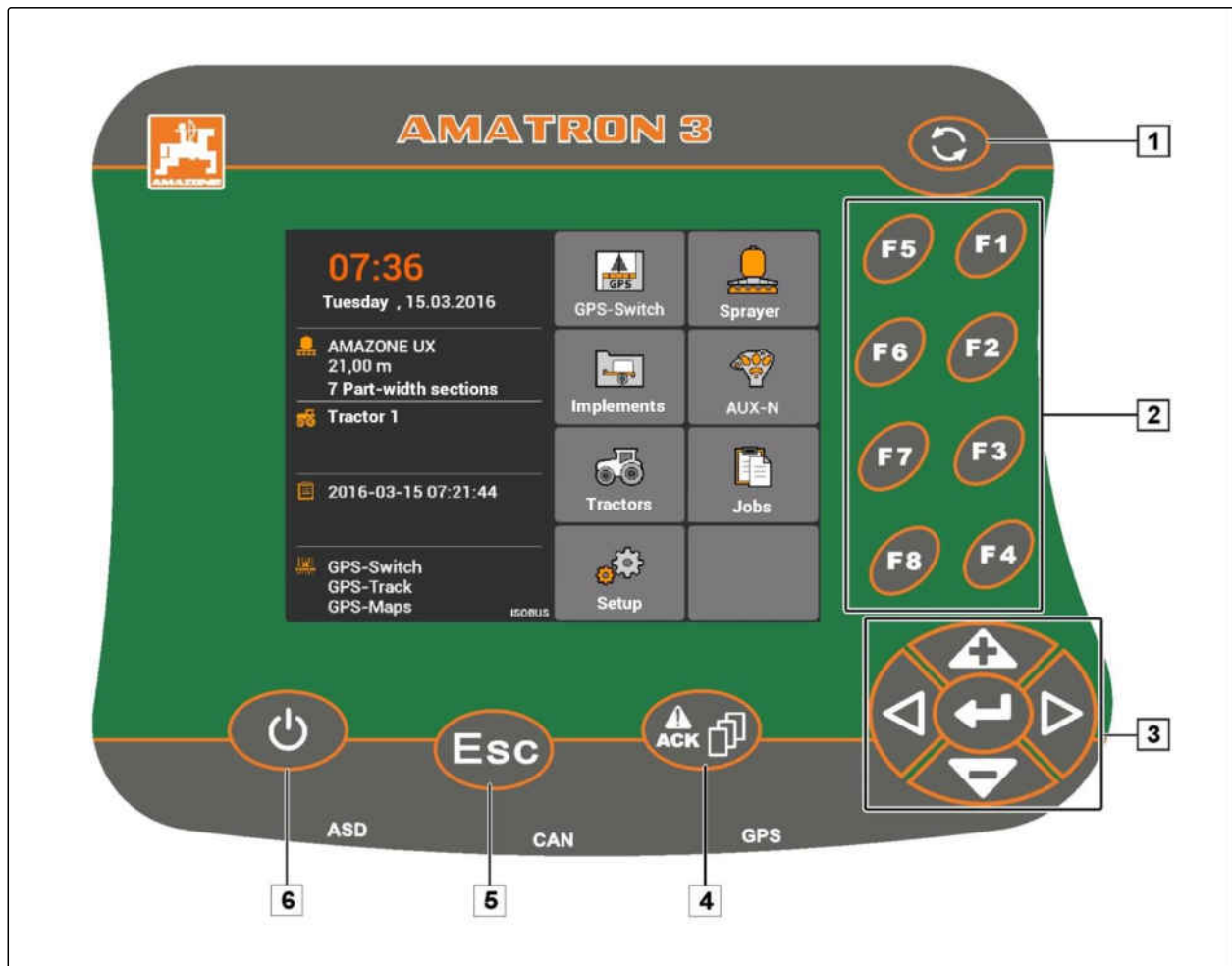
3

CMS-T-005005-B.1

3.1

Front side

CMS-T-005009-A.1



1 Toggle button: Switch between the selected menus and applications

2 F keys: Press the buttons on the display

3 Directional pad: Change the selection on the display, change numerical values, confirm selections

4 ACK: Acknowledge messages from the Universal Terminal. In AMABUS mode: Scroll through the implement controls

5 Escape: Back, cancel

6 On/Off button: Switching the AMATRON 3 on and off

3.2

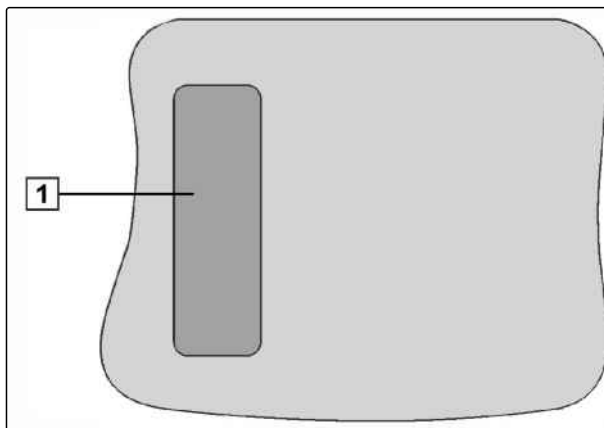
Rear side

CMS-T-00004670-A.1

Shift key

CMS-T-005609-A.1

- 1** Shift key for the work menu of the implement controls



CMS-I-001943

Rating plate and CE mark

CMS-T-005605-A.1

The following information is listed on the rating plate:

- 1** Implement ID no.
2 Type



CMS-I-001944

Basic operation

4

CMS-T-005654-C.1

4.1

Using the toggle button

CMS-T-001877-B.1

The toggle button **1** can be used to switch among the selected menus.

- To switch among the selected menus consecutively,

press  briefly.

- To switch to the main menu,

press  and hold.



NOTE

The menus for the toggle button can be selected in the setup menu, see page 29.

In the factory settings, the GPS switch is enabled by default. If other implements such as a sprayer, AmaPilot+ or new, ISOBUS-compatible implements are on the bus, they are automatically enabled.




CMS-I-002162


4.2

Using the F keys

CMS-T-001882-B.1

The arrangement of the keys "F1" to "F8" corresponds to the arrangement of the buttons on the display. When explaining the procedures, this operating manual uses the symbols on the buttons. To execute the procedures, the corresponding F key must be pressed.

 : To select the top right button

 : To select the top left button



CMS-I-001942





4.3

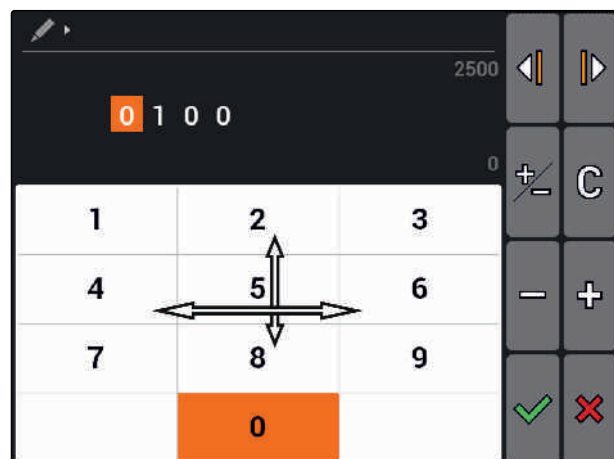
Using the directional pad

CMS-T-002407-B.1

 and  : Move the selection up or down

 and  : Move the selection to the left or right

 : Accept the number



CMS-I-002304





4.4


Entering text




CMS-T-005121-A.1

When text must be entered, a menu is opened with a character area and additional buttons.


Text menu overview

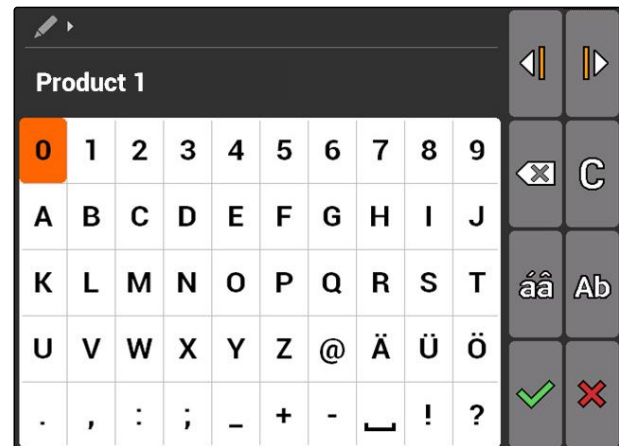
 and : Move the cursor left and right


: Deletes the character in front of the cursor


,  or : Switch between upper and lower case letters

: Shows letters with accents


: Clears the input field



1. Use the directional pad to select the desired character in the character area.
2. Add the selected character to the input field with .

3. Confirm the entry with .

or

Cancel the entry with .



4.5

Entering numerical values


CMS-T-005126-A.1


When numerical values must be entered, a menu is opened with a number area and additional buttons.


Number menu overview

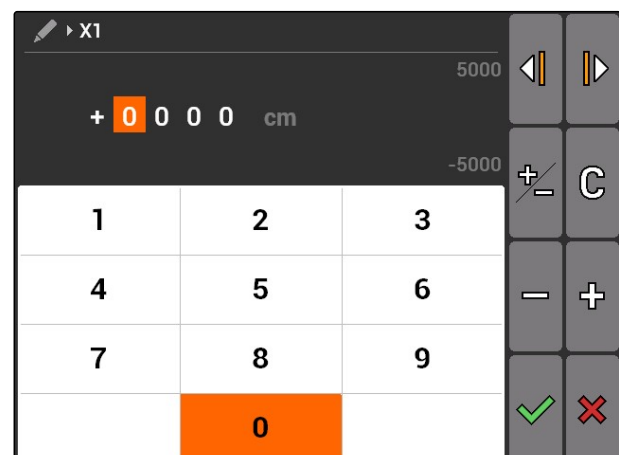
 and : Move the cursors left and right

: Reverses the sign

: Increases the marked number by 1

: Reduces the marked number by 1

: Clears the input field



1. Use the directional pad to select the desired number in the number area.
2. Add the selected number to the input field with



NOTE

The maximum and minimum values are shown to the right beside the input field.

3. Confirm the entry with

or


Cancel the entry with

4.6

Using the shift key

CMS-T-005601-A.1

The shift key is needed for the work menu of the implement controls. When the shift key is active, it is shown on the display.

- ▶ Press  on the rear side of the AMATRON 3.
- ➔ Other function field will be shown, which changes the assignment of the function keys.

After switching on

5

CMS-T-00004671-A.1

5.1

Selecting the BUS mode

CMS-T-003915-A.1

After starting the AMATRON 3, it is possible to select between 2 BUS modes. The selection of the BUS mode depends on the connected implement.




BUS modes:

- AMABUS
- ISOBUS



NOTE

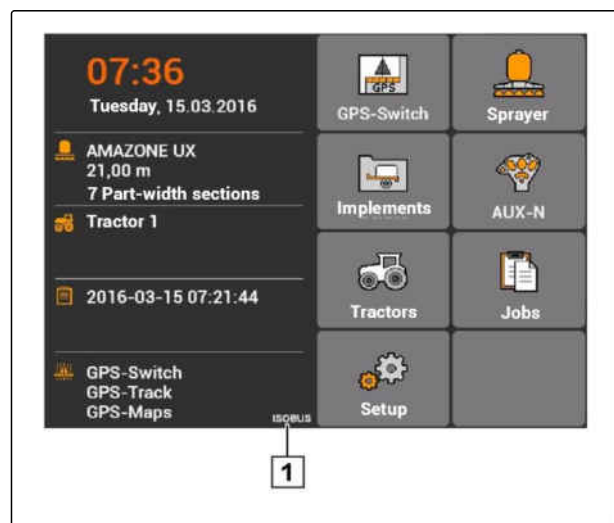
After 10 seconds, the AMATRON 3 automatically starts in the previously selected BUS mode. If the AMATRON 3 should start directly in the previously selected BUS mode, the corresponding mode must be activated in the setup, see page 30.

1. Select the mode with  or .
2. Confirm with .



CMS-I-002103

- ➔ The set BUS mode is shown in the main menu 1.



CMS-I-002124



5.2

Checking the AUX-N assignments

CMS-T-003920-A.1

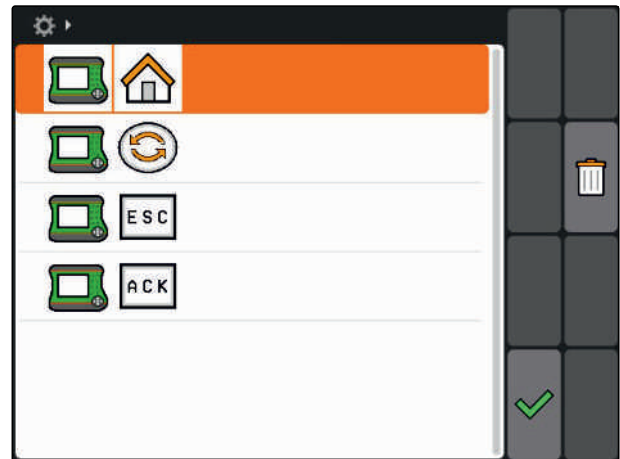
Each time the AMATRON 3 is restarted, the assignment of the external input devices must be checked and confirmed for safety reasons. The AMATRON 3 only recognises external input devices in ISOBUS mode.

A list of all available functions is opened. The list contains the functions of the AMATRON 3 and the functions of the devices connected.

1. Scroll through the assignment list with  and .
2. If the AUX-N assignments should be changed, see page 17

or

If the AUX-N assignments are correct, confirm the AUX-N assignments.




CMS-I-001449

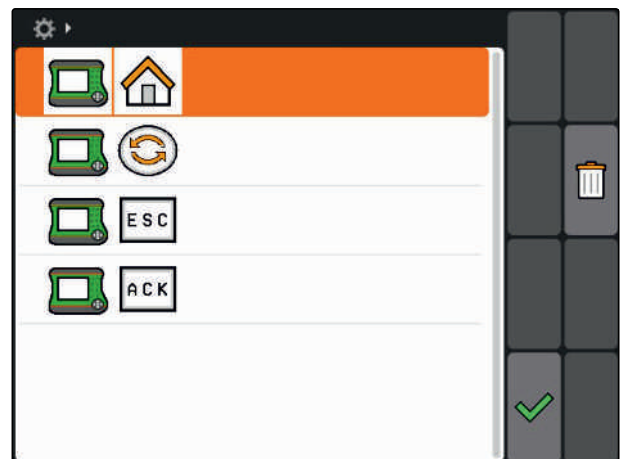
5.3

Changing the AUX-N assignments


CMS-T-003925-A.1

1. Select a desired function from the list with .

➔ A list with the input buttons will be opened.



CMS-I-001449

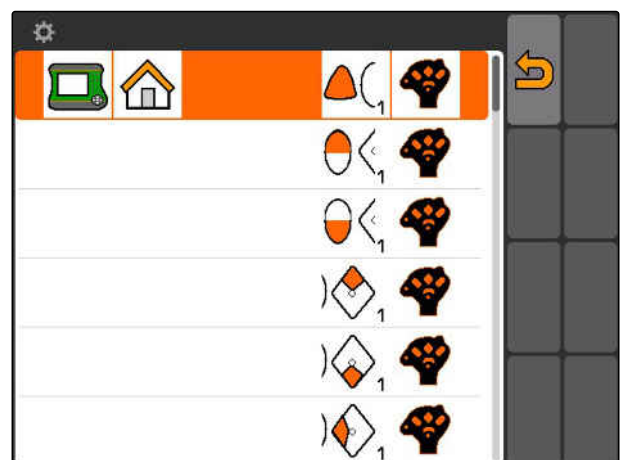
2. Select a desired input button with .

➔ The input button is assigned to the selected function.

3. Assign other functions

or

Confirm the assignment with .



CMS-I-001452



NOTE

The button assignment can be changed at any time in the setup, see page 31.

Main menu overview

6

CMS-T-003525-A.1

- 1 Time and date
- 2 Selected implement
- 3 Selected tractor
- 4 Started job
- 5 Activated GPS applications with remaining time in hours



: Opens the GPS switch. Using the GPS switch, see page 74



: Opens the implement controls. The symbol varies depending on the connected implement.



: Opens the implement management. Configuring the implement, see page 42



: Opens the AUX-N assignment overview. Using the AUX-N assignment overview, see page 131



: Opens the tractor management. Tractor configuration, see page 47



: Opens the job management. Managing jobs, see page



: Opens the setup menu. Setup menu configuration, see page



AMATRON 3 configuration

7

CMS-T-00000267-B.1

7.1

Entering the basic settings

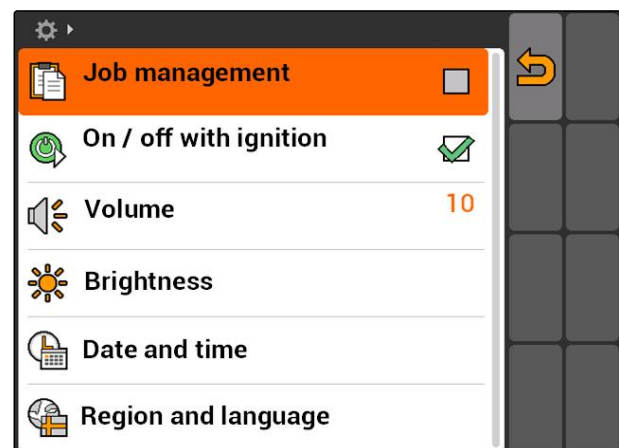
CMS-T-00004672-A.1

7.1.1 Enabling or disabling job management

CMS-T-004829-A.1

Job management can be used to process jobs in ISO-XML format. Job management can be enabled or disabled. Job management is disabled per default. If job management is enabled, GPS switch can only be used with a started job in ISO-XML format.

1. Select "Setup" > "Settings" > "Basic settings".
2. Enable or disable job management
3. Restart the AMATRON 3.



CMS-I-001209

7.1.2 Enabling or disabling ignition switching

CMS-T-004834-A.1

This setting defines whether the AMATRON 3 is coupled with the vehicle ignition.



REQUIREMENTS

- ✓ The AMATRON 3 is in ISOBUS mode, see page 15

1. Select "Setup" > "Settings" > "Basic settings".

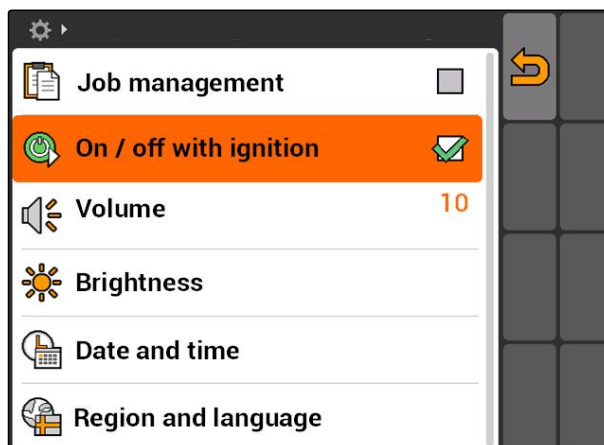
Possible settings:



: When the vehicle ignition is switched on or off, the AMATRON 3 is switched on or off.



: The AMATRON 3 must be switched on and off manually.



CMS-I-002050

2. Enable or disable ignition switching

7.1.3 Adjusting the volume

CMS-T-005131-A.1

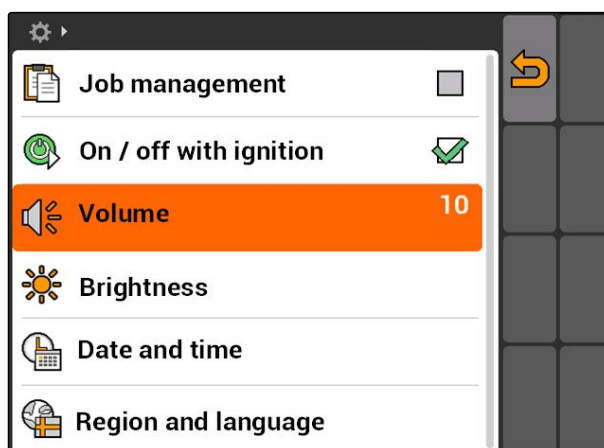
In this menu, the volume of the signal tones can be adjusted.

1. Select "Setup" > "Settings" > "Basic settings" > "Volume".
2. Enter a value between 1 and 20.
3. Confirm the entry.



NOTE

The AMATRON 3 cannot be muted.

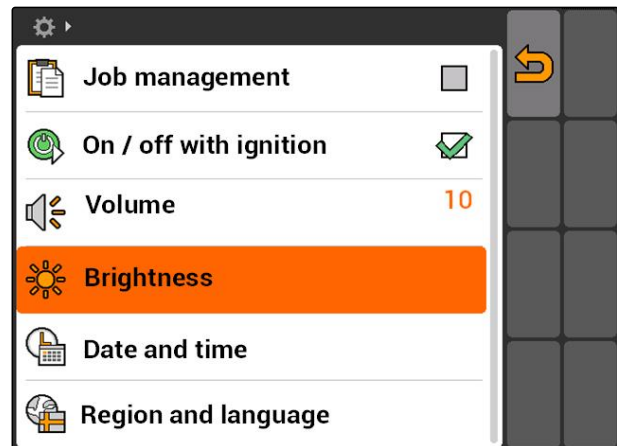


CMS-I-001519

7.1.4 Setting the brightness

- Select "Setup" > "Settings" > "Basic settings" > "Brightness".

CMS-T-001958-A.1



CMS-I-001695

Possible settings:



: Percent value for the display brightness during the day



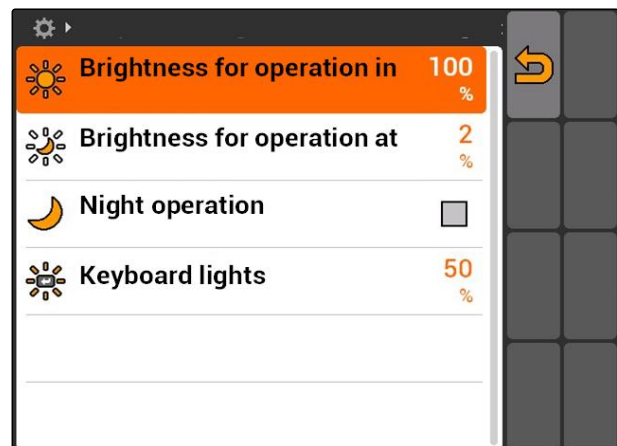
: Percent value for the display brightness at night



: Sets the display brightness to the value entered under "Brightness for operation at night".



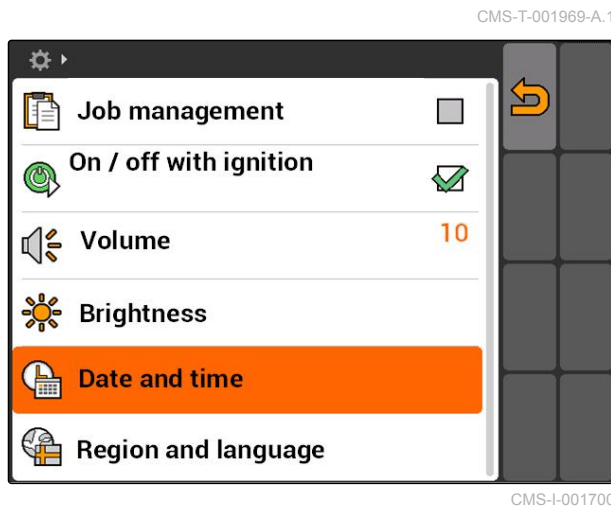
: Percent value for the brightness of the button illumination on the AMATRON 3



CMS-I-001166

7.1.5 Setting the date and time

- Select "Setup" > "Settings" > "Basic settings" > "Date and time".



Possible settings:



: Day, month and year for the current date



: Hours and minutes for the current time



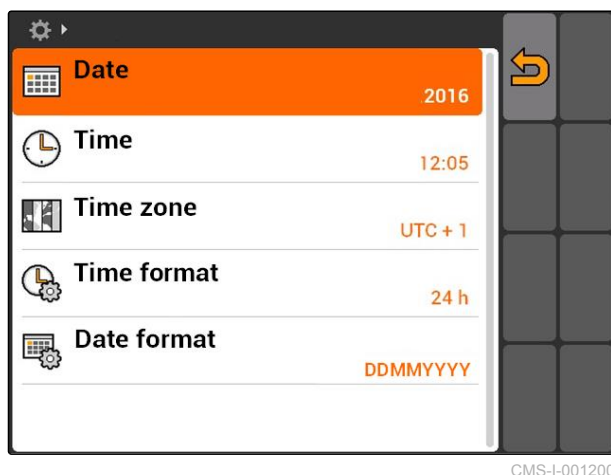
: Value between -13 and +12 for the corresponding time zone



: 24-hour format or 12-hour format



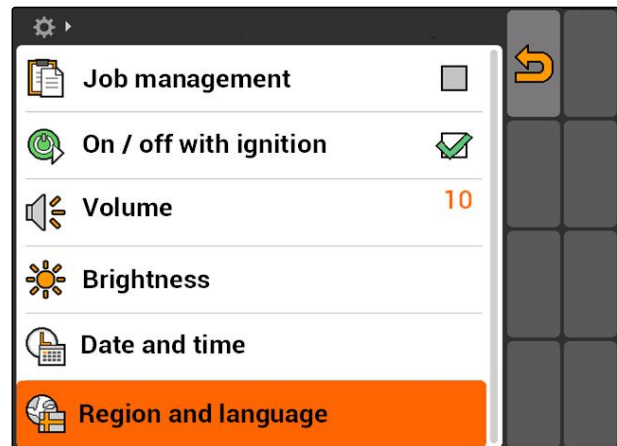
: Various date formats, "DD" for the day, "MM" for the month, "YYYY" for the year



7.1.6 Setting the region and language

CMS-T-001974-A.1

- Select "Setup" > "Settings" > "Basic settings" > "Region and language".



CMS-I-002381

Possible settings:



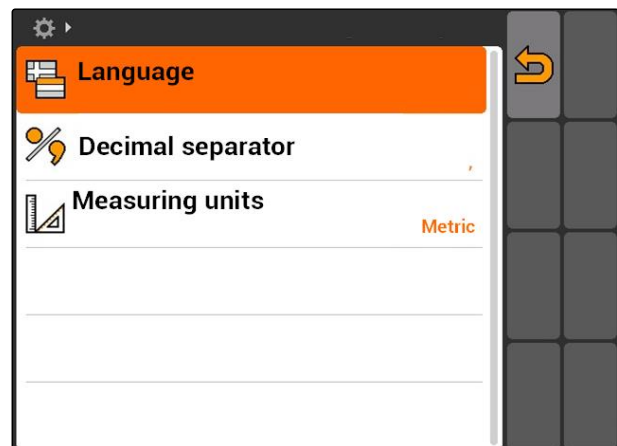
: Language for the user interface



: Point or comma as a separator for decimal numbers (0.1 or 0,1)



: System of units for the units of measure



CMS-I-001204

7.2

Configuring ISOBUS

CMS-T-001933-A.1



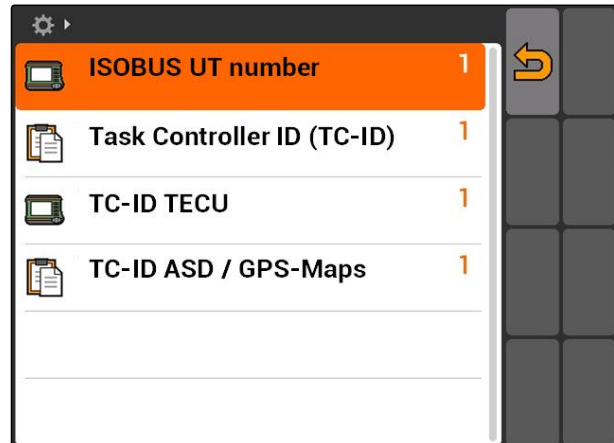
REQUIREMENTS

- ✓ The ISOBUS can only be configured in ISOBUS mode, see page 15

1. Select "Setup" > "Settings" > "ISOBUS".

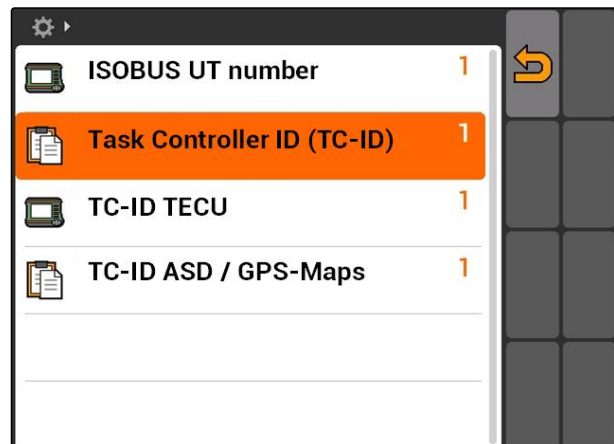
The AMATRON 3 has a clear identification number for the Universal Terminal, the ISOBUS-UT number. If the implement controls should be displayed on the AMATRON 3, the ISOBUS-UT number must match with the ISOBUS-UT number of the implement. If the AMATRON 3 is the only connected terminal, the implement automatically adopts the ISOBUS-UT number of the AMATRON 3.

2. Under "ISOBUS-UT number", enter the identification number for the Universal Terminal of the AMATRON 3.



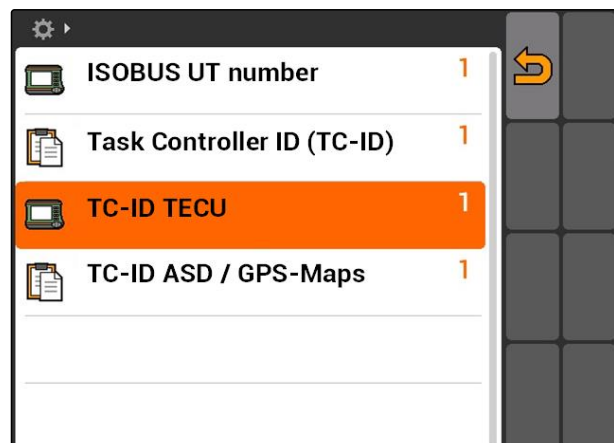
For job documentation, the AMATRON 3 has a clear identification number, the Task Controller ID. If the job documentation should be saved on the AMATRON 3, the Task Controller ID must match with the Task Controller ID of the implement. If the AMATRON 3 is the only connected terminal, the implement automatically adopts the Task Controller ID of the AMATRON 3.

3. Under "Task Controller ID", enter the identification number for the Task Controller of the AMATRON 3.



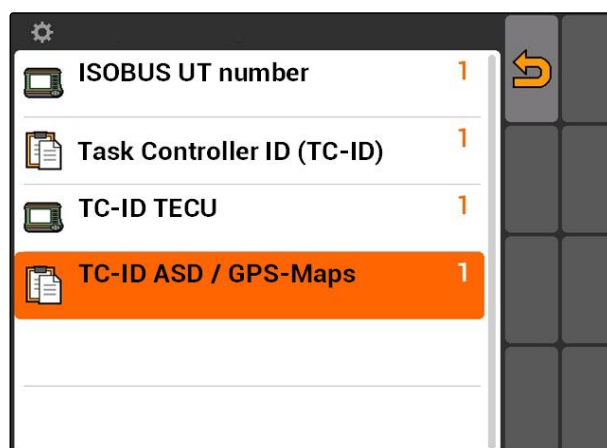
If the connected tractor does not send any geometry or sensor data or if the tractor data should not be used, the AMATRON 3 can simulate a tractor. The AMATRON 3 has a clear identification number for the simulated tractor, the TC-ID TECU. To be able to use the simulated TECU, the TECU-ID must match with the Task Controller ID.

4. Under "TC-ID TECU", enter the identification number for the simulated Tractor-ECU.



If an implement is connected to the ASD interface, the TC-ID ASD/GPS maps defines where the incoming data should be sent. To be able to use the ASD interface and GPS maps, the TC-ID ASD/GPS maps must match with the Task Controller ID

- Under "*TC-ID ASD/GPS maps*", enter the identification number for the ASD interface and GPS maps.



7.3

GPS configuration

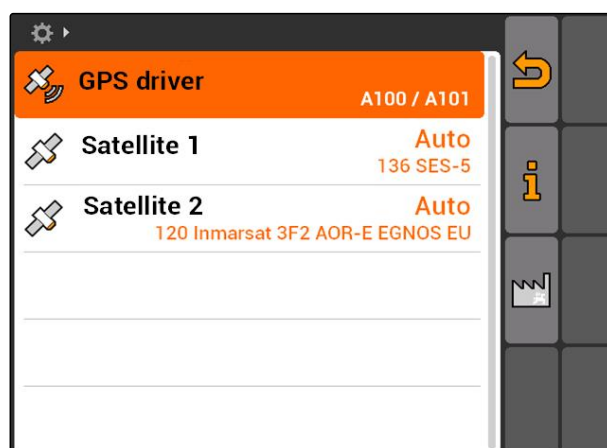
CMS-T-00000268-A.1

7.3.1 Setting up the A100/A101 receiver

CMS-T-005811-B.1

This GPS receiver provides the option of setting both correction satellites manually. The correction satellites send correction data to the receivers. The correction data increase the accuracy.

- Select "*GPS driver*" > "*A100/101*".
 - Under "*Satellite 1*" and "*Satellite 2*", select "*Auto*".
- ➔ With the "*Auto*" setting, the GPS receiver automatically searches for the correct satellites.



7.3.2 Setting up the AG-STAR receiver

CMS-T-005816-B.1

This GPS receiver can be operated with different configurations. The configurations differ in terms of the satellite system and correction satellites. The GPS receiver can be adjusted according to the region and availability of correction services.



NOTE

With the SBAS correction signal, a signal with higher accuracy is available as long as the SBAS correction signal is received.

SBAS includes the correction services EGNOS, WAAS and MSAS. For more information on this topic, please consult the operating manual for the satellite receiver.

Without the correction signal, the received signal is only corrected by a software. It can take up to 5 minutes for the corrected signal to be available.

If no corrected signal is available, the worked area will be shown in yellow in GPS switch. When a corrected signal is available, the worked area will be shown in green.

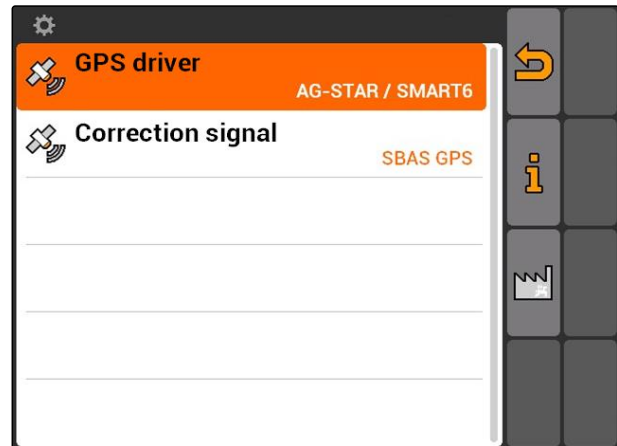
Possible settings for AG-STAR with SBAS correction signal:

- SBAS GPS
 - Suitable for North America, Europe and Russia
 - 12 GPS satellites
 - 2 SBAS satellites
- SBAS GPS / GLONASS
 - Suitable for North America, Europe and Russia
 - 8 GPS satellites
 - 4 GLONASS satellites
 - 2 SBAS satellites

Possible settings for AG-STAR without SBAS correction signal:

- GPS / GLONASS 1
 - Suitable worldwide if SBAS is not available
 - 10 GPS satellites
 - 4 GLONASS satellites
- GPS / GLONASS 2
 - Suitable worldwide if SBAS is not available
 - 8 GPS satellites
 - 6 GLONASS satellites

1. Select "GPS driver" > "AG-STAR/SMART6".
2. Under "Correction signal", select the desired correction signal.



7.3.3 Setting up the SMART6 receiver

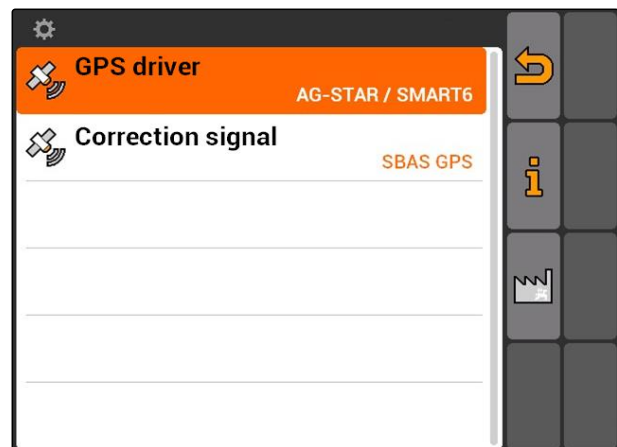
CMS-T-00000274-A.1

The SMART6 can receive the TerraStar correction signal and therefore offers higher accuracy.

Possible settings for SMART6:

- SBAS
- TerraStar

1. Select "GPS driver" > "AG-STAR/SMART6".
2. Under "Correction signal", select the desired correction signal.



7.3.4 Setting up other GPS receivers

CMS-T-005821-B.1

1. Select "GPS driver" > "Other".
2. Under "Baud rate", enter the baud rate for the GPS receiver.

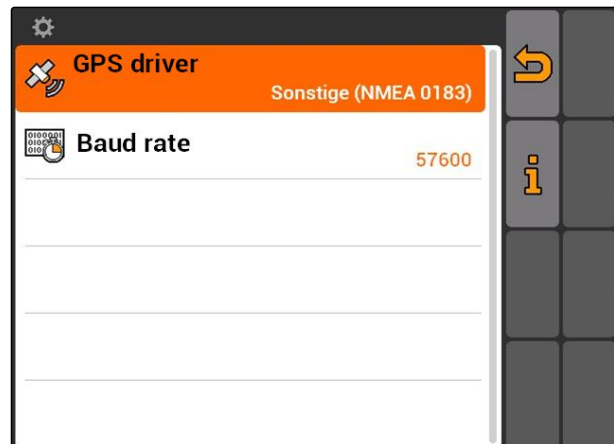


NOTE

More information on the baud rate can be found in the GPS receiver operating manual.

The connected receiver must send the following messages to the terminal:

- GGA
- GSA
- VTG



7.4

Setting up the ASD interface

CMS-T-006321-A.1

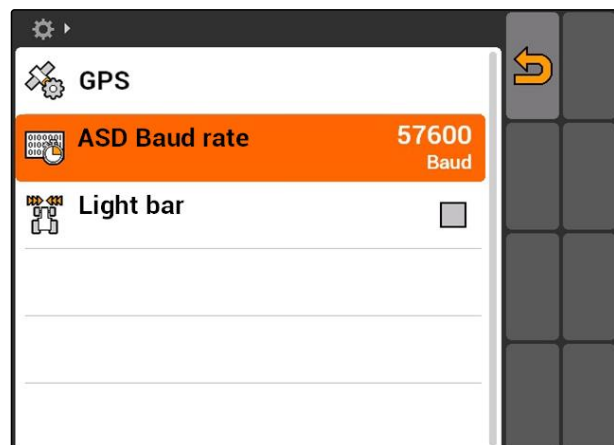
The ASD interface can be used to transmit setpoints for the application rate from a sensor. To be able to use these setpoints, the setpoints must be added to a job, see page 55.

To set up the ASD interface, the baud rate for the data transfer rate must be selected for the connected implement. The correct baud rate is written in the implement operating manual.

- Select "Setup" > "Settings" > "Interfaces" > "ASD baud rate".

Possible settings:

- 57600 baud
- 19200 baud

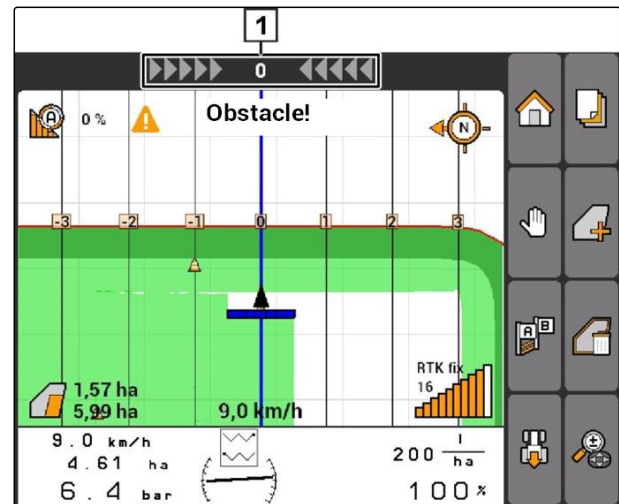


7.5

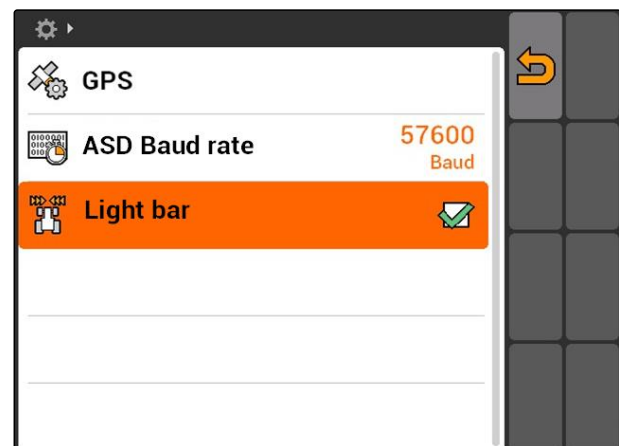
Adjusting the light bar

CMS-T-004993-A.1

The light bar **1** shows the deviation of the tractor from the guide track and thereby enables precise following of the guide tracks.



1. Select "Setup" > "Settings" > "Interfaces" > "Light bar".
2. Enable or disable the light bar
3. Restart the AMATRON 3.



7.6

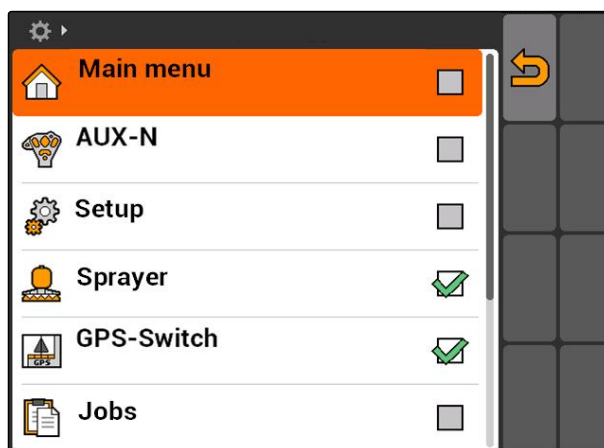
Configuring the toggle button

CMS-T-001943-A.1



can be used to switch among the selected menus and applications.

1. Select "Setup" > "Settings" > "Toggle button".
2. Select the menus that should be reached using the toggle button.



7.7

Defining the start mode

CMS-T-001948-A.1

The AMATRON 3 can be started in 3 different modes.

- Select "Setup" > "Settings" > "Start mode".

Possible settings:



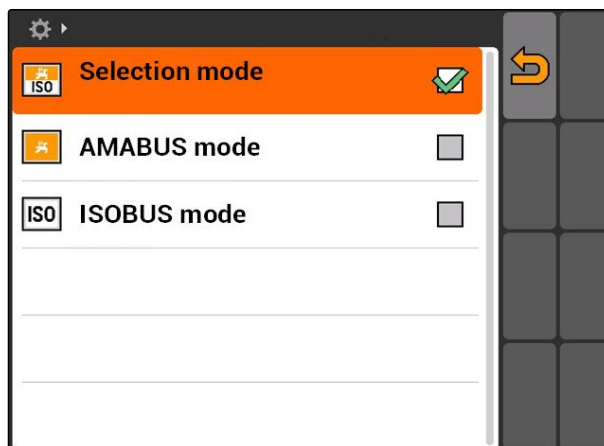
: The BUS mode can be selected when the AMATRON 3 is started.



: The AMATRON 3 always starts in AMABUS mode



: The AMATRON 3 always starts in ISOBUS mode



7.8

Configuring parallel operation

CMS-T-001953-A.1

Multiple terminals can be used simultaneously. To be able to use several terminals at the same time, the ISOBUS must be configured in the ISOBUS settings and if applicable, in the implement controls (UT), see page 24. This menu defines which functions should be performed by the AMATRON 3. If for example two AMATRON 3 terminals are being used, one AMATRON 3 can be used to display the implement

controls and the other AMATRON 3 for the GPS functions.

- Select "Setup" > "Settings" > "Parallel operation".

Possible settings:



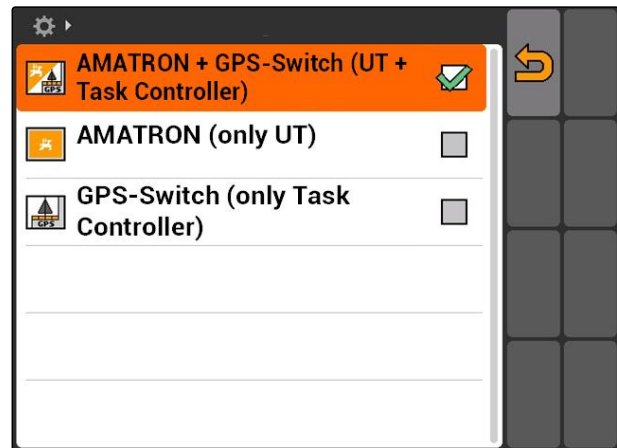
The AMATRON 3 can be used to access the implement controls and the GPS functions are available.



The AMATRON 3 can only be used to access the implement controls. The Task Controller is signed off of the BUS.



Only the GPS functions are available on the AMATRON 3. The UT is signed off of the BUS



7.9

Using AUX-N input devices

CMS-T-00004673-A.1

7.9.1 Defining the AUX-N assignment

CMS-T-001913-B.1

With the AUX-N assignment, specific functions of the AMATRON 3 and the implement can be assigned to buttons on an external input device. However, the AMATRON 3 functions can only be assigned to an external input device if the AMATRON 3 has the ISOBUS-UT number 1, see page 24. An example for such an external input device is the AmaPilot⁺. If a button on the AmaPilot⁺ is assigned to a function on the implement, the function can be actuated with the assigned button.



REQUIREMENTS

- ✓ The AMATRON 3 is in ISOBUS mode, see page 15

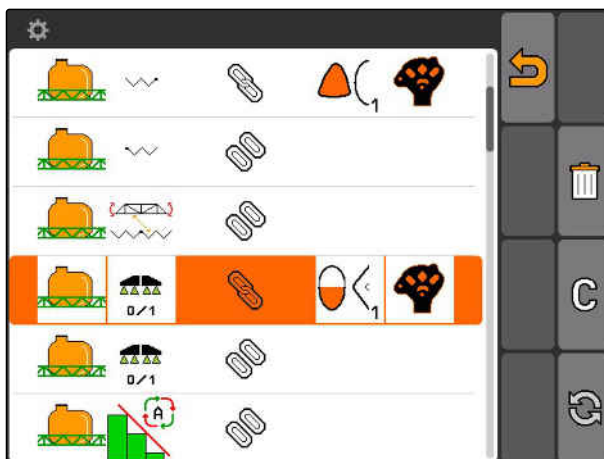
- Select "Setup" > "AUX-N assignment".

➔ A list of available functions will be displayed.

Possible settings:

Define the AUX-N assignment using the functions list, see page 32

Define the AUX-N assignment using the input list, see page 33



7.9.1.1 Defining the AUX-N assignment using the functions list

CMS-T-002245-A.1

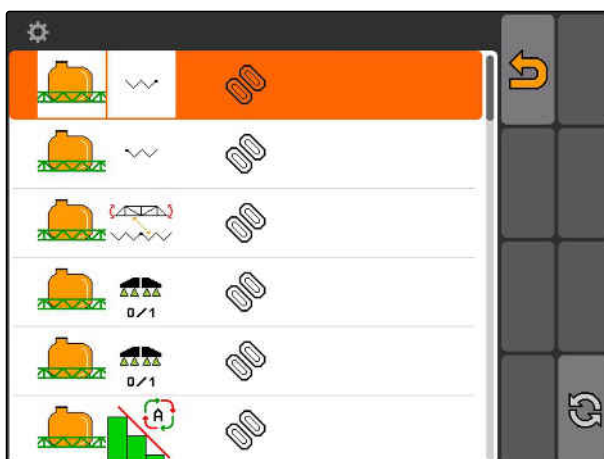
For the AUX-N assignment using the functions list, all of the available functions are listed on the left side. The buttons of an external input device can be assigned to these functions.

1. If the functions are not listed on the left side:

Select .

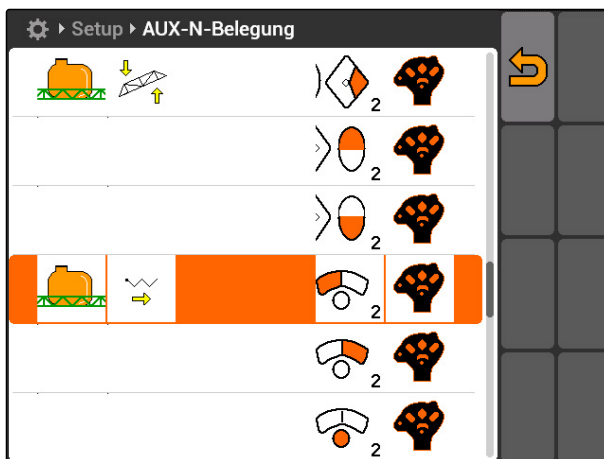
2. Select a function from the list.

➔ The list of available buttons will be opened.



3. Select a button from the list.

➔ The selected button is assigned to the function.



7.9.1.2 Defining the AUX-N assignment using the input list

CMS-T-002235-A.1

For the AUX-N assignment using the input list, all of the available buttons are listed on the left side. These buttons can be assigned to functions.

1. If the buttons are not listed on the left side:

Select .

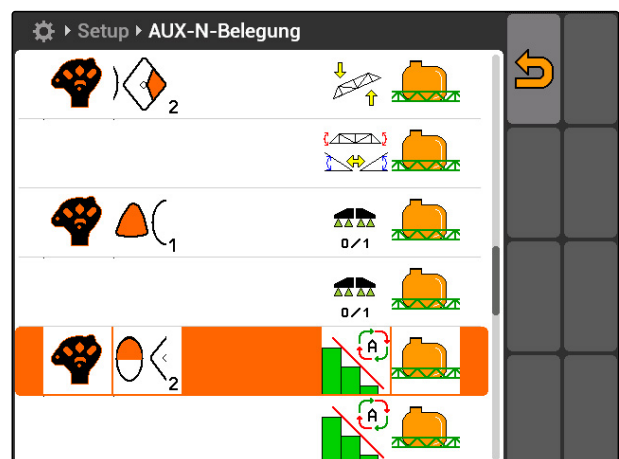
2. Select a button from the list.

➔ The list of available functions will be opened.



3. Select a function from the list.

➔ The button is assigned to the selected function.

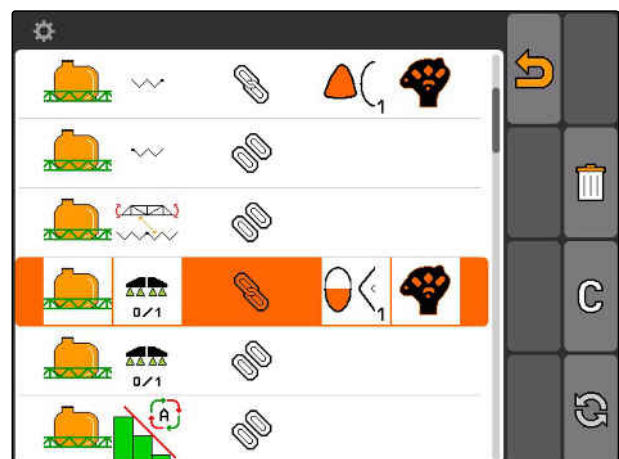


7.9.1.3 Deleting the selected AUX-N assignment

CMS-T-005136-A.1

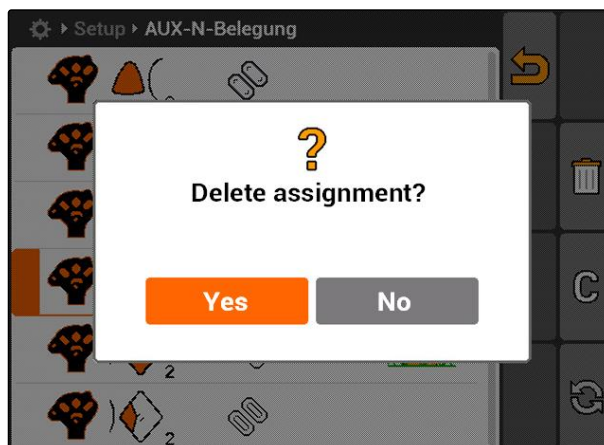
1. Select the desired assignment from the list.

2. Select .



3. Confirm with "Yes".

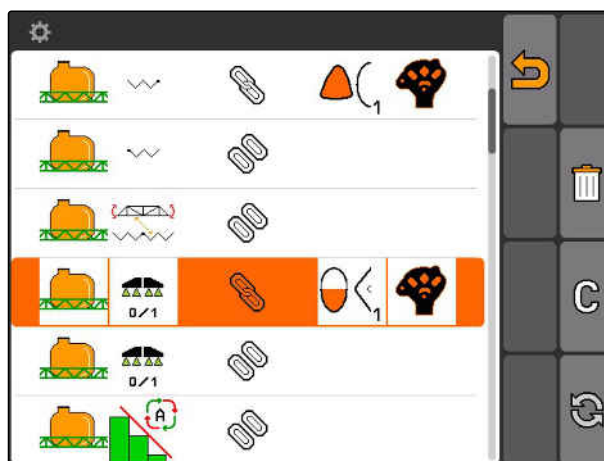
➔ The assignment will be deleted.



7.9.1.4 Deleting all AUX-N assignments

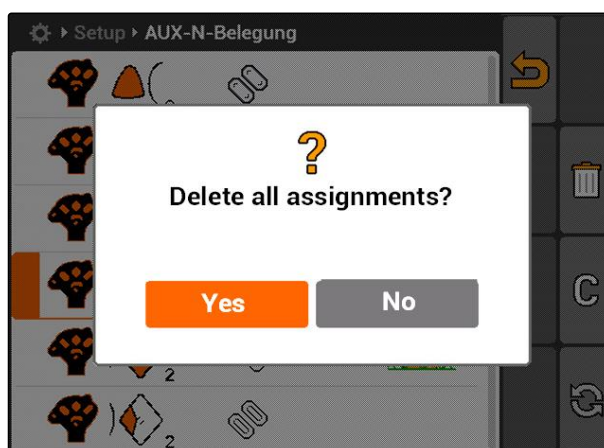
CMS-T-002240-A.1

1. Select .



2. Confirm with "Yes".


➔ The assignment will be deleted.



7.9.2 Defining the AUX-N assignment using the functions list

CMS-T-002245-A.1

For the AUX-N assignment using the functions list, all of the available functions are listed on the left side. The buttons of an external input device can be assigned to these functions.

1. If the functions are not listed on the left side:
select .

2. Select a function from the list.

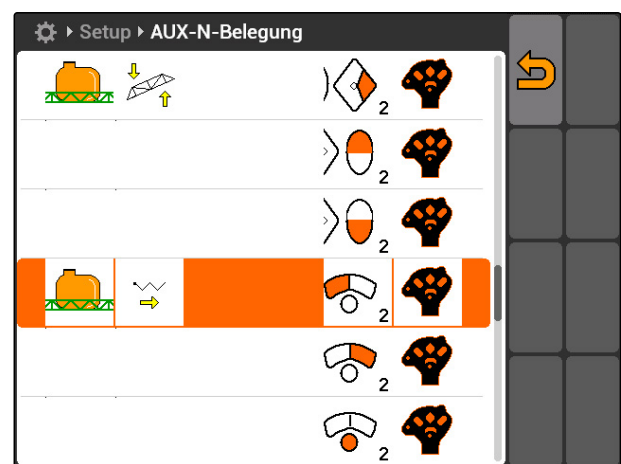
➔ The list of available buttons will be opened.



CMS-I-001178

3. Select a button from the list.

➔ The selected button is assigned to the function.




CMS-I-001171

7.9.3 Defining the AUX-N assignment using the input list

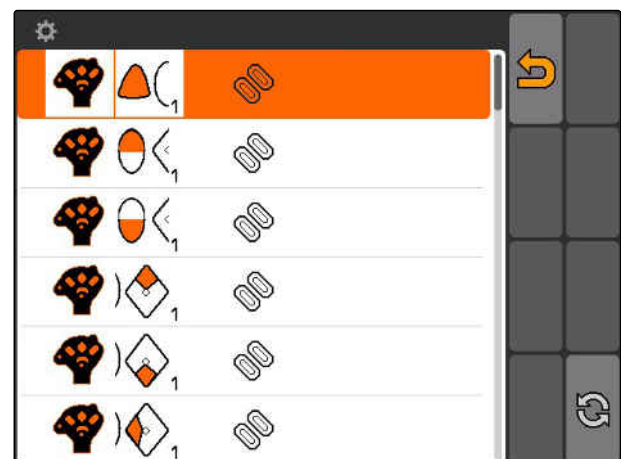
CMS-T-002235-A.1

For the AUX-N assignment using the input list, all of the available buttons are listed on the left side. These buttons can be assigned to functions.

1. If the buttons are not listed on the left side:
select .

2. Select a button from the list.

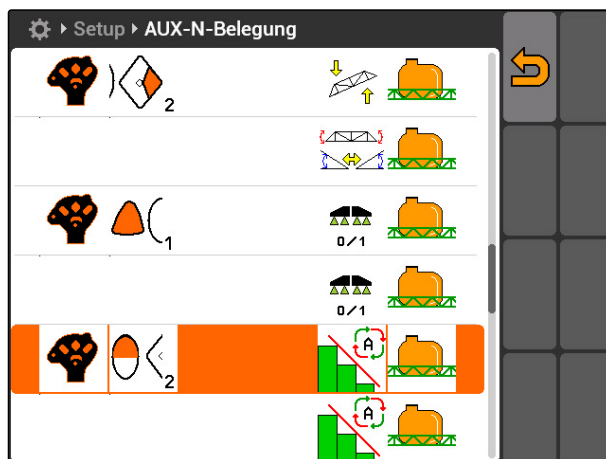
➔ The list of available functions will be opened.



CMS-I-001174

3. Select a function from the list.

➔ The button is assigned to the selected function.

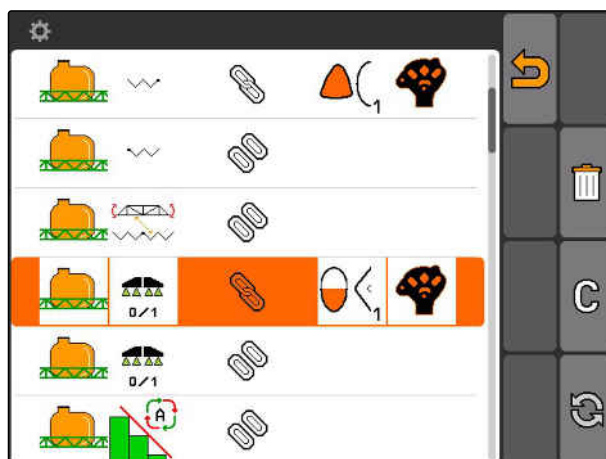


CMS-I-001180

7.9.4 Deleting the selected AUX-N assignment

1. Select the desired assignment from the list.

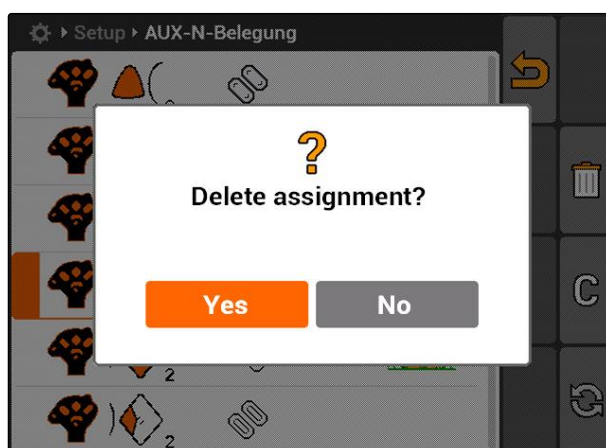
2. select .



CMS-I-001774

3. Confirm with "Yes".

➔ The assignment will be deleted.

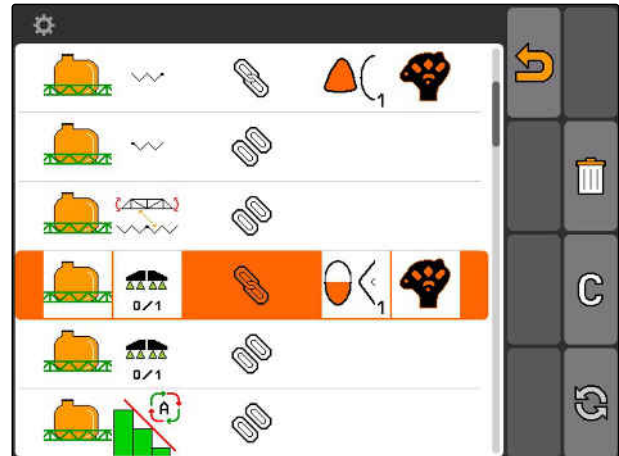


CMS-I-001523

7.9.5 Deleting all AUX-N assignments

CMS-T-002240-A.1

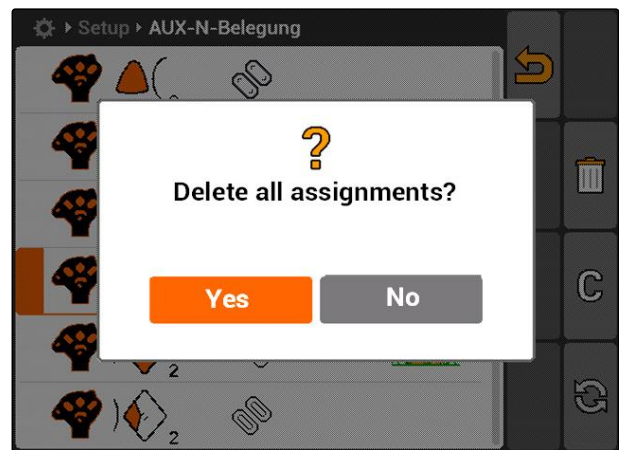
1. select .



CMS-I-001774

2. Confirm with "Yes".

➔ The assignment will be deleted.



CMS-I-001527

7.10

Using the licence management

CMS-T-001918-A.1

3 applications can be run on the AMATRON 3:

- GPS switch
- GPS track
- GPS maps



NOTE

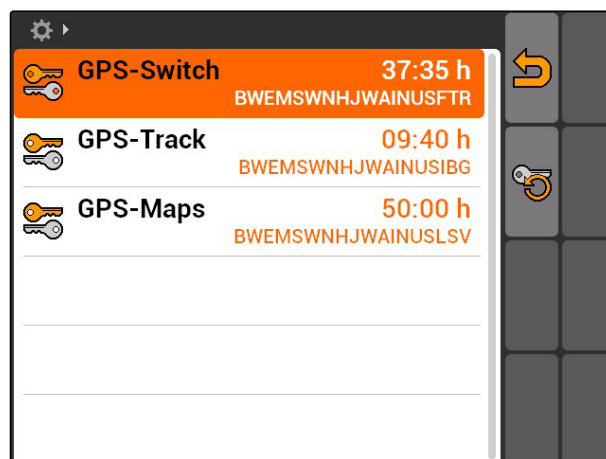
The 3 applications are activated for a period of use of 50 hours. To be able to use the applications without restrictions, the license key must be purchased from AMAZONE.


Licence management can be used to activate the 3 applications on the AMATRON 3, to be able to use these applications permanently.

The following table shows an overview of the functions that are activated with the licences.

Functions	GPS switch	GPS track	GPS maps	No licence
Setting reference points and calibrating the GPS	X	X	X	X
Driving direction detection	X	X	X	X
Zooming and panning the map	X	X	X	X
Configure headlands	X	X		
Creating field boundaries	X	X		
Creating obstacles	X	X		
Manually drawing the treatment of fields	X	X		
Manual and automatic part-width section control	X			
Automatic boom lowering	X			
Creating track lines				
Creating track lines in the headlands		X		
Displaying the map gridlines		X		
Using application maps			X	


1. Select "Setup" > "Settings" > "License management".
2. Select the desired application.

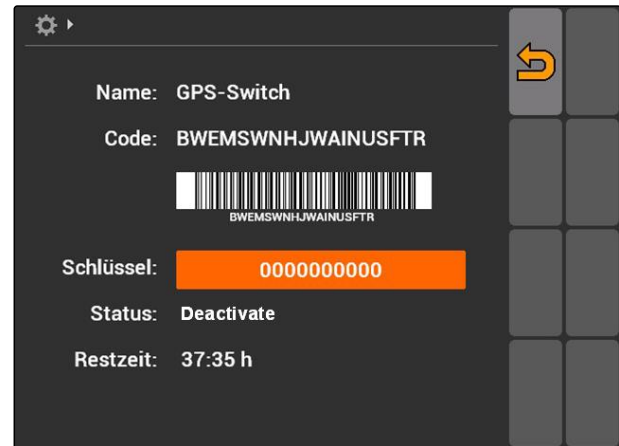


3. Press .
4. Enter the license key and confirm.

➔ The application is activated.

NOTE

If the licence keys were accidentally deleted,
press  to restore them.



7.11

Using the diagnostics

CMS-T-00004674-A.1


7.11.1 Using USB management

CMS-T-00004700-A.1

Formatting the USB flash drive

CMS-T-002061-A.1

1. *If all of the data on the USB flash drive should be deleted:*

select .


2. Confirm with "Yes".

➔ The USB flash drive will be formatted.

Deleting files or folders from the USB flash drive

CMS-T-002066-A.1

1. Select the desired file or folder from the list.

2. select .

3. Confirm with "Yes".

➔ The file or folder will be deleted.

Saving data to a USB flash drive

CMS-T-002071-A.1

With this function, all of the recorded job data will be saved to the USB flash drive.



REQUIREMENTS

- ✓ Job management enabled; see page 19

► select

➔ The job data will be saved to the USB flash drive.

7.11.2 Using the pool management

CMS-T-001990-A.1

"Pool" refers to a file that describes the representation of the implement software on the terminal. After connecting an implement for the first time or after an update, the pool of the implement will be automatically loaded and saved on the terminal. A pool can be reloaded if it was previously deleted in the pool management and the terminal as well as the implement were restarted.

1. Select "Setup" > "Settings" > "Diagnosis" > "Pool management".

➔ A list with the pools will be opened.

2. Select the pool.

3. select

4. Confirm deleting.

5. Restart the AMATRON 3.



CMS-I-001722


7.11.3 Using the CAN diagnosis

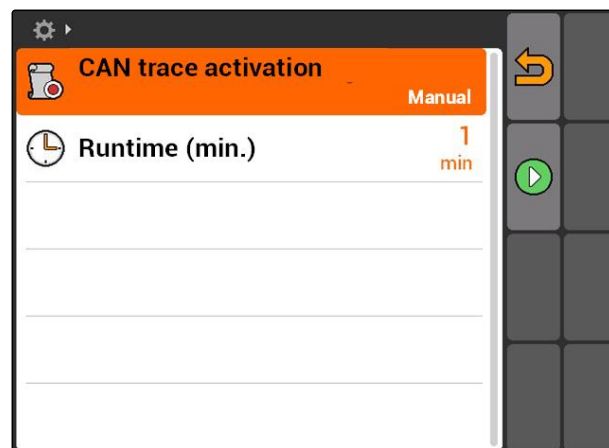
CMS-T-001995-A.1

CAN diagnosis is for the exclusive use of service employees for maintenance purposes.




REQUIREMENTS

- ✓ USB flash drive is inserted
- 1. Select "Setup" > "Settings" > "Diagnosis" > "CAN diagnosis".
- 2. Under "CAN trace activation", set whether the CAN trace should be started manually or after the AMATRON 3 is restarted.
- 3. Under "Runtime", set the recording time in minutes.
- 4. If "Manual" was set under "CAN trace activation",
start the CAN trace with 
or
If "After terminal restart" was set under "CAN trace activation",
restart the AMATRON 3.



CMS-I-001477

➔ The CAN trace has been started.

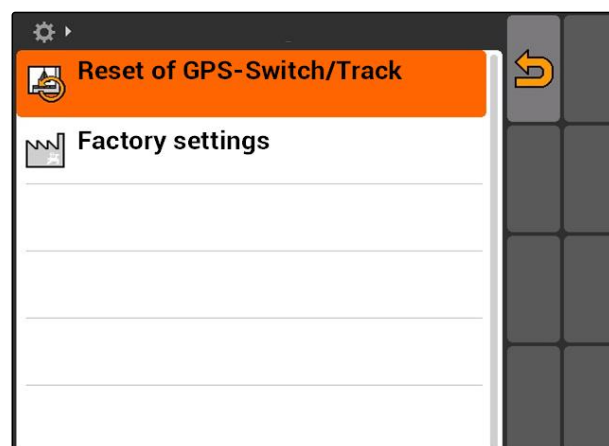
- 5. To stop the CAN trace:
select .

7.11.4 Performing a reset

CMS-T-002000-A.1

In this menu, the GPS switch settings and the AMATRON 3 setting can be reset.

- 1. Select "Setup" > "Setting" > "Diagnosis" > "Reset".
- 2. To reset the GPS switch settings,
Select "Reset GPS switch/track".
- 3. To reset the AMATRON 3 settings and delete the data,
Select "Factory settings".
- 4. Confirm the reset.



CMS-I-002209

Configuring implements



CMS-T-00004675-A.1

8.1

Managing implements

CMS-T-001892-B.1

To be able to use the GPS switch functions, the following implements must be configured:

- AMABUS implements
- Implements that cannot communicate with the terminal

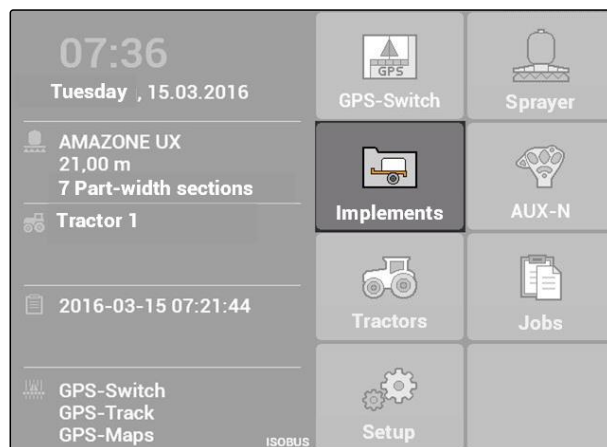
Using the entered implement data, the AMATRON 3 can control the connected implement.

The following implement data must be entered:

- Implement name
- Implement type
- Geometry data
- Part-width section data

ISOBUS implements sign in automatically and do not require configuration

- Select Main menu > "Implements".



CMS-I-002180

Implement menu overview

- 1 Existing implements
- 2 Information on the selected implement



: Opens the main menu



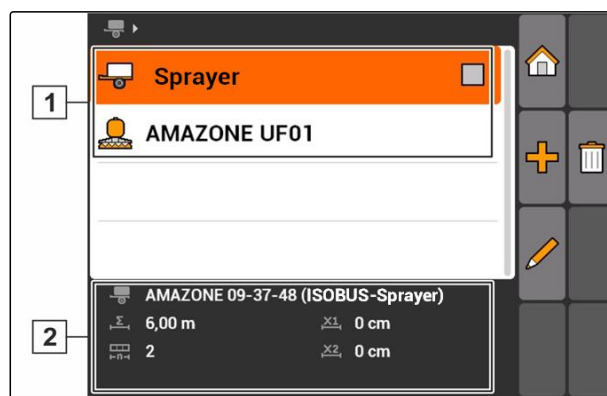
: Adds an implement



: Deletes the selected implement



: Opens the implement data for the selected implement, see page 43



CMS-I-002213

8.2

Editing the implement data

CMS-T-002023-B.1



NOTE

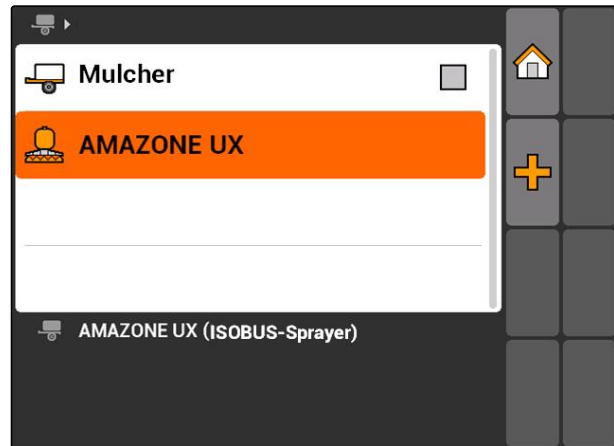
The implement data for ISOBUS implements must be edited through the implement controls in the UT setup.

1. Select "Main menu" > "Implement".
2. Add a new implement

or

Edit an existing implement

➔ The "Implement data" menu will be opened.



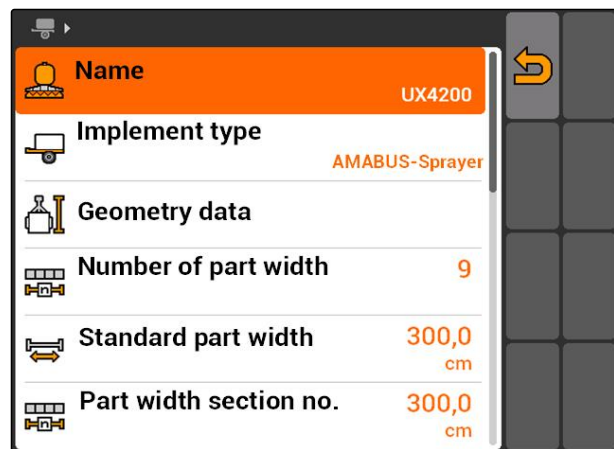
CMS-I-001685

3. Enter a name for the implement under "Name".
4. If an AMABUS implement is connected, select the connected implement under "Implement type".

NOTE

The implement type can only be selected if the AMATRON 3 was started in AMABUS mode, see page 15.

5. Under "Number of part-width sections", enter the number of part-width sections for the implement.
6. To assign all of the part-width sections with the same width, enter a common value for all part-width sections under "Standard part-width section".
7. If a width should be assigned to a specific part-width section, enter a value for the respective part-width section under "Part-width section no.:". "



CMS-I-002221

NOTE

The numbering of the part width sections is carried out from left to right in the direction of travel.

8.3

Editing the implement geometry data

CMS-T-001963-A.1

For the GPS switch to function properly, the implement geometry data is required. The part-width

section control, track guidance and variable rate control depend on the correct geometry.

1. Select "Implement data" > "Geometry data".

CMS-I-002225

2. Under "X1", enter the distance between the coupling point and the application point.

NOTE

Application points:

- Field sprayers: Spray nozzles
- Fertiliser spreaders: Centre point of the spreading discs
- Seed drills: Rear seeding coulters

CMS-I-001236

3. Under "X2", enter the distance between the coupling point and the axle.

NOTE

- The value "X2" is only required for towed implements. If "Towed" is selected for the implement modelling in the GPS switch settings, the value "X2" can be entered, see page 79.
- If the geometry values for a spreader are changed, the headland distance must be changed to the same value in the GPS switch settings, see page 83.

8.4

Selecting the implement

CMS-T-004824-A.1

If one of the following implements is connected, this connected implement must be selected to be able to use GPS switch:

- AMABUS implement
- Implements that cannot communicate with the terminal

ISOBUS implements sign in to the BUS automatically and do not require configuration.

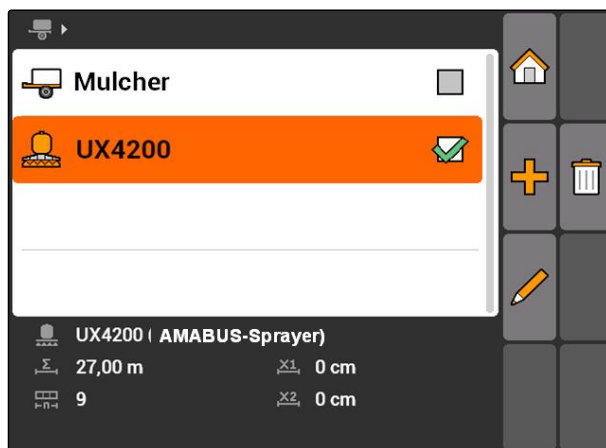


REQUIREMENTS

- ✓ Edit implement data, see page 43

Selectable implements have a check box: ☐.

- Mark the desired implement.



CMS-I-002217

Configuring tractors

9

CMS-T-00004676-A.1

9.1

Managing tractors

CMS-T-001903-B.1

For the AMATRON 3 to be able to control the connected implement properly, the data for the utilised tractor must be transmitted to the AMATRON 3.

The following tractor data is required:

- Geometry data
- Sensor data



NOTE

ISOBUS tractors can automatically transmit their data to the AMATRON 3. The ISOBUS tractor must be configured accordingly. More information on this topic can be found in the ISOBUS tractor operating manual.

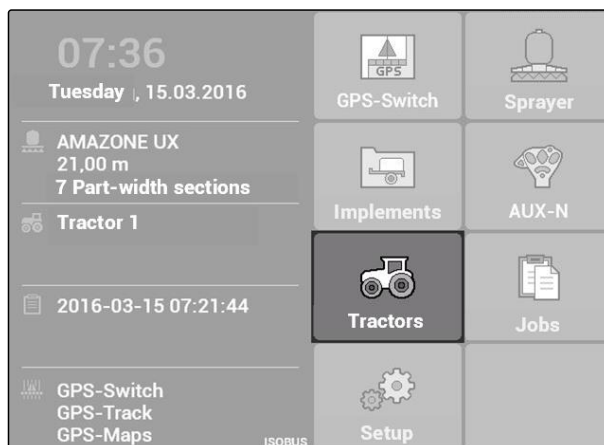


NOTE

A tractor must be configured in the following cases:

- The AMATRON 3 is operated in AMABUS mode
- Data transmission of the ISOBUS tractor is disabled
- The data sent by the ISOBUS tractor should not be used

- Select Main menu> "Tractors".



CMS-I-002171

Tractor menu overview

- 1 Available tractors
- 2 Information on the selected tractor



: Opens the main menu



: Adds a tractor, see page 48



: Deletes the selected tractor



: Opens the tractor data for the selected tractor for editing.see page 48



CMS-I-001576

9.2

Editing the tractor data

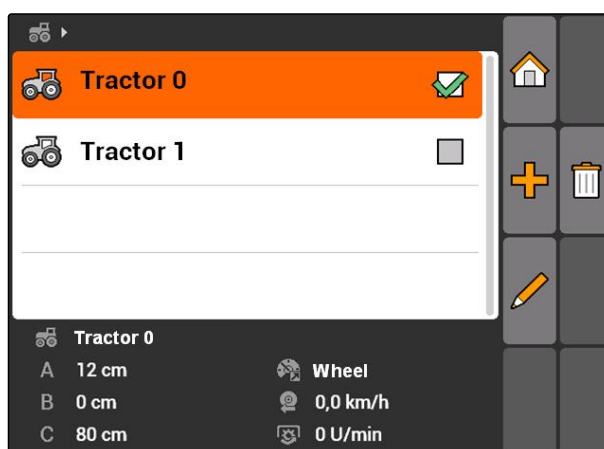
CMS-T-002599-B.1

1. Add a new tractor in the "Tractors" menu

or

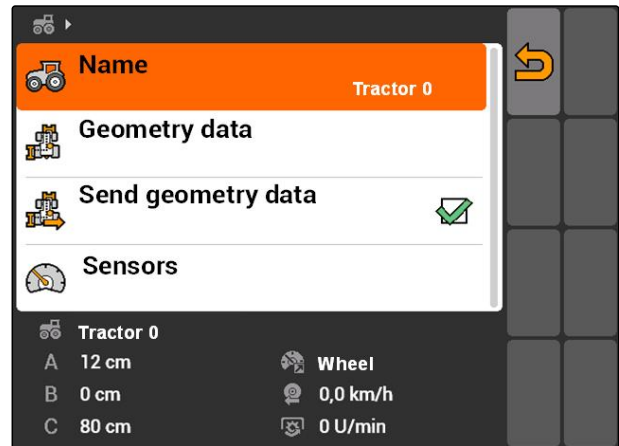
Edit a selected tractor.

- ➔ The "Tractor data" menu will be opened.



CMS-I-001273

2. Enter a name for the tractor under "Name".



CMS-I-001277

9.3

Editing the tractor geometry data

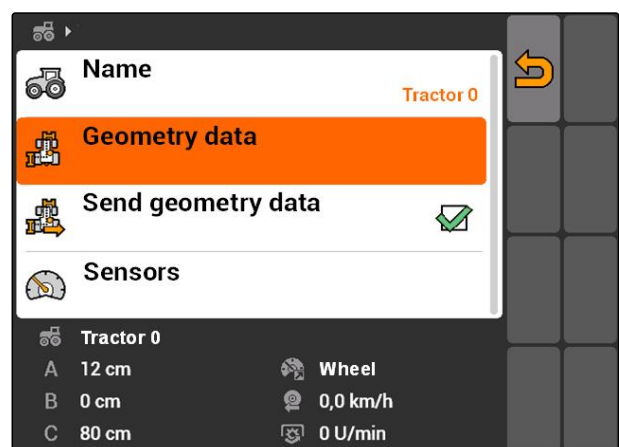
CMS-T-002589-B.1

The implement geometry data is required for the GPS switch to function properly. The part-width section control, track guidance and variable rate control depend on the correct geometry.

The geometry data must be entered in the following cases:

- The tractor does not send any geometry data.
- The geometry data sent by the tractor should not be used.
- The GPS receiver was installed on the tractor retroactively.

1. "Tractor data" > "Geometry data".

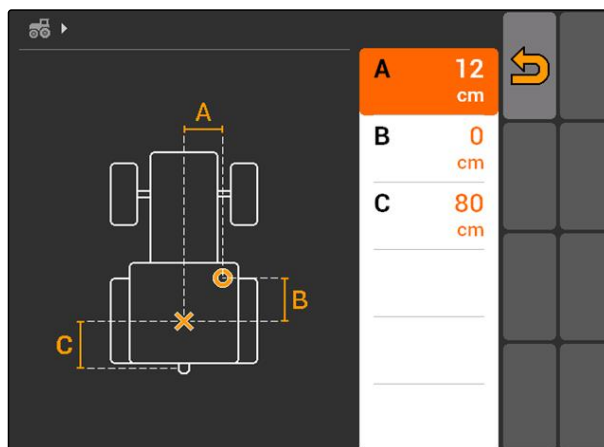


CMS-I-001580

2. *If the receiver is installed to the right of the centre of the axle,*
enter a positive value for the distance between the GPS receiver and the centre of the axle under "A"

or

If the receiver is installed to the left of the centre of the axle,
enter a negative value for the distance between the GPS receiver and the centre of the axle under "A"



CMS-I-001263

3. *If the receiver is installed in front of the centre of the axle,*
enter a positive value for the distance between the GPS receiver and the centre of the axle under "B"

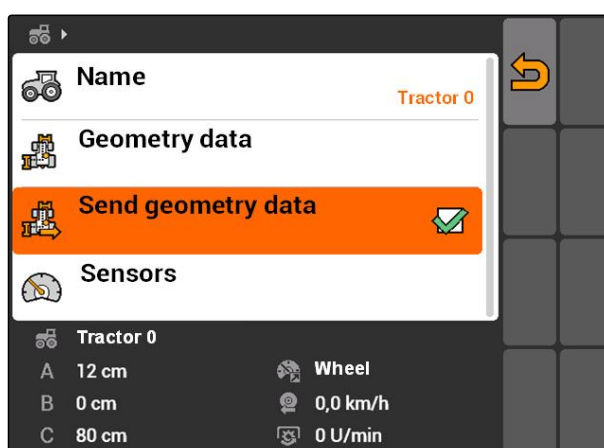
or

If the receiver is installed behind the centre of the axle,
enter a negative value for the distance between the GPS receiver and the centre of the axle under "B"

4. Under "C", enter the distance between the rear axle and the coupling point.

➔ The geometry data for the tractor has been defined.

5. *To be able to use the geometry data,*
enable the "Send geometry data" function in the "Tractor data" menu.



CMS-I-001643

9.4

Configuring the tractor sensors

CMS-T-002594-B.1

The tractor sensor must only be configured if the tractor does not have any speed sensors and therefore does not send speed data. In the case, the speed data can be transmitted to the AMATRON 3 by external sensors, e.g. wheel sensors or GPS sensors.

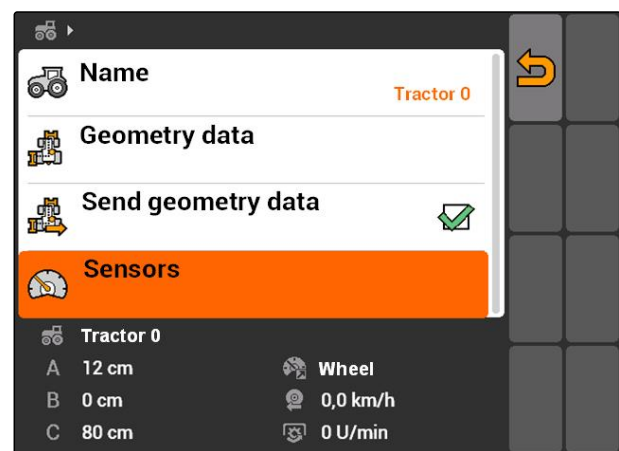


REQUIREMENTS

- ✓ The AMATRON 3 is started in ISOBUS mode, see page 15

1. "Tractor data" > "Sensors".

➔ The "Sensors" menu will be opened.



CMS-I-002229

2. Under "Speed source", enter the device used to determine the tractor speed.



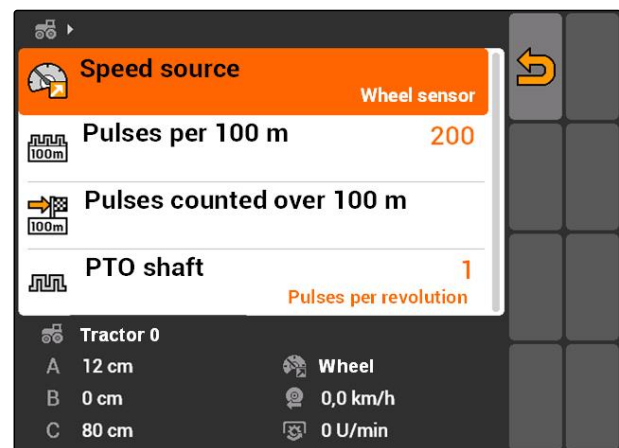
NOTE

Only speed sources that are not yet signed in to the ISOBUS are shown.

3. Under "PTO shaft", enter the number of pulses sent by the PTO shaft with each rotation.
4. If the wheel sensor or radar sensor was selected under "Speed source", enter the number of pulses sent by the wheel sensor or radar sensor over a distance of 100 m under "Pulses per 100 m"

or

If the number of pulses per 100 m is not known, Select "Count pulses over 100 m" and follow the instructions on the screen.



CMS-I-001267

9.5

Selecting the tractor

CMS-T-004819-A.1

To use the GPS switch, a tractor must be selected.

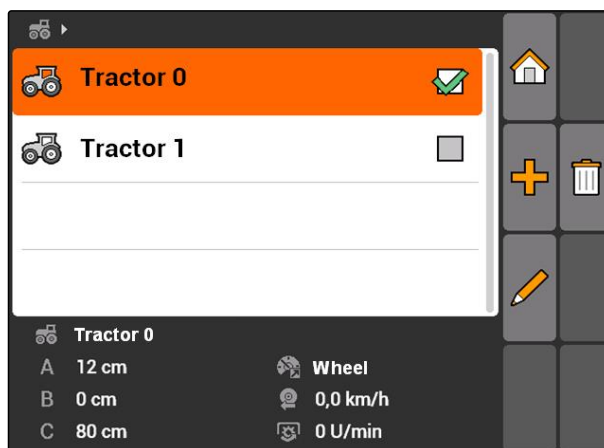


REQUIREMENTS

- ✓ Tractor data edited, see page 43

► Mark the desired tractor.

➔ The tractor is selected.



CMS-I-001273

Using the job management

10

CMS-T-00004677-B.1

10.1

Managing jobs

CMS-T-00004698-A.1

Job management can be used to process jobs in ISO-XML format. The ISO-XML jobs can be created with a Farm Management Information System (FMIS) and imported to the AMATRON 3 with a USB flash drive. Alternatively, the jobs can be created and edited on the AMATRON 3.

From a job in ISO-XML format, the field boundaries and application maps can be processed with GPS switch.

Two types of application maps can be imported:

- Map type 1: This type of map is displayed on the GPS switch map. The stored setpoints are transmitted to the implement and processed.
- Map type 2: This type of map is not displayed on the GPS switch map. The stored setpoints are transmitted to the implement and processed.

When a job has been started on the AMATRON 3, the field boundaries and the application map are displayed on the GPS switch map and the job data is recorded. The recording of job data depends on the created ISO-XML job and the connected implement.

Among others, the following job data can be recorded:

- Application/spread rates
- Application positions
- Operating time of tractors and implements

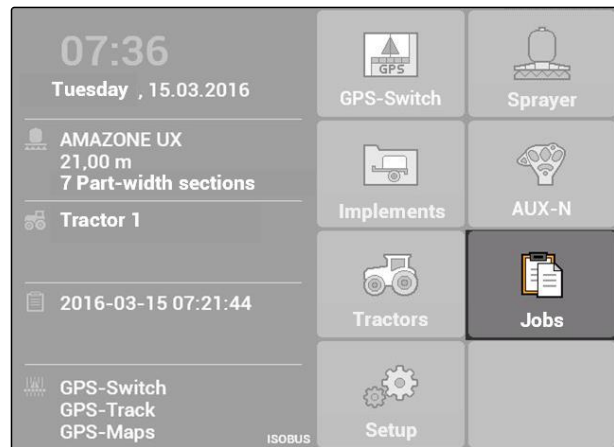
The finished jobs can be exported and further processed with a Farm Management Information System (FMIS).



REQUIREMENTS

- ✓ Job management is enabled, see page 19
- ✓ USB flash drive is inserted

► Main menu > "Jobs".



CMS-I-002175

Job menu overview

- 1 Existing jobs
- 2 Information on the selected job



: Opens the main menu



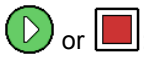
: Opens the master data menu, see page



: Adds a job, see page 55



: Deletes the selected job



: Starts or stops the selected job, see page 64 and see page 65



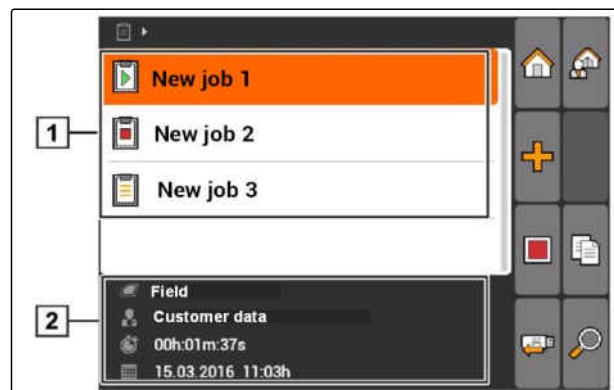
: Copies the selected job, see page 63



: Exports the jobs, see page 65



: Opens the search function, see page 63



CMS-I-002241

10.2

Editing jobs

CMS-T-00004679-B.1

10.2.1 Creating a new job

CMS-T-002036-B.1

With the AMATRON 3, jobs can be created in ISO-XML format and edited. The created jobs can be exported and further processed with a Farm Management Information System (FMIS).

The following additional data can be added to the jobs:

- Field data
- Customer data
- Setpoints for application/spread rates:
- Product data
- Worker data
- Implement data
- Tractor data

1. Select Jobs > .

➔ The "New job" menu will be opened.

2. Enter the job name.

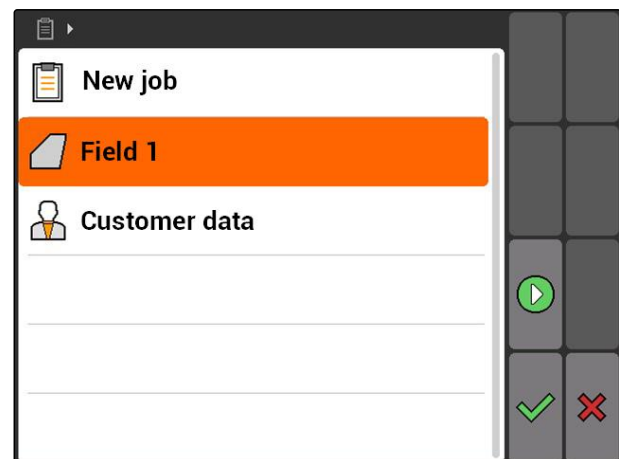
3. Select the field.

4. Select the customer.

NOTE

In the the menus for selecting the customer, see page 70 and for selecting the field, see page 69 customers and fields can also be created.

5. Confirm entries.



CMS-I-000348

10.2.2 Adding setpoints to a job

CMS-T-004280-B.1

Controllable implement elements can be assigned with setpoints. For example, the application rates for a sprayer and the spread rates for a spreader or seed drill can be defined.

The setpoints for the application/spread rates can come from the following sources:

- Setpoints created on the AMATRON 3
- From an imported application map in shape format
- From an external device using the ASD interface



REQUIREMENTS

- ✓ Job is started, see page 64

If the setpoint should be taken from the master data:

- ✓ Setpoints are created in the master data, see page 67

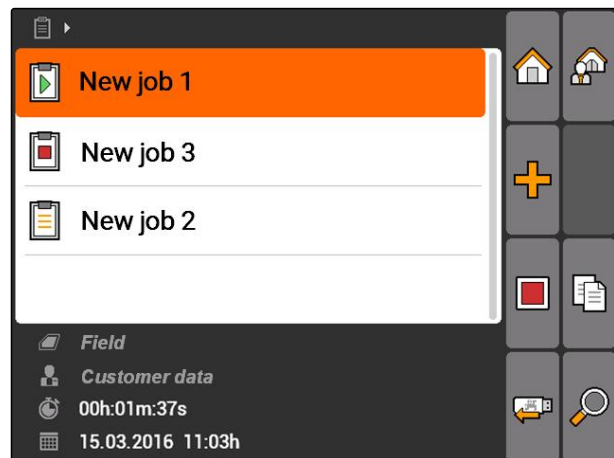
If the setpoint should be taken from an application map in shape format:

- ✓ Application map in shape format is imported, see page 122

If the setpoint should be transmitted with the ASD interface:

- ✓ ASD interface is configured, see page 28

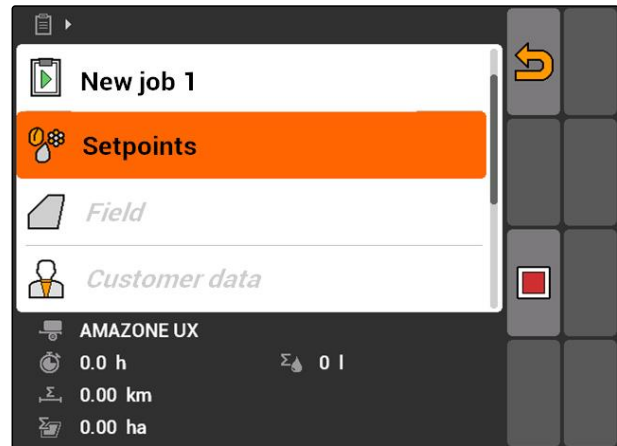
1. "Jobs" > Select the started job.



CMS-I-002248

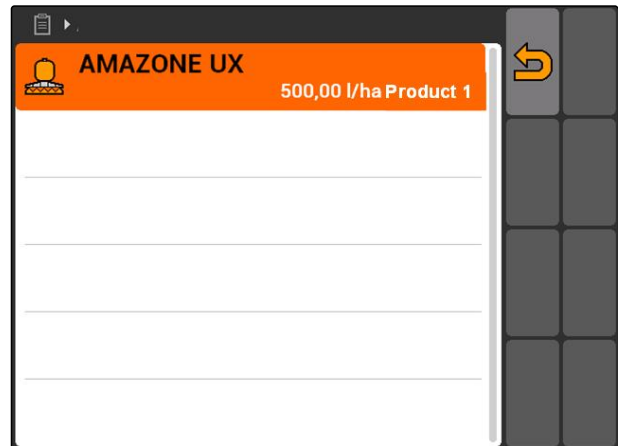
2. Select "Setpoints".

➔ The "Setpoints" menu will be opened. The controllable implement elements will be shown.



CMS-I-002565

3. Select a controllable implement element.

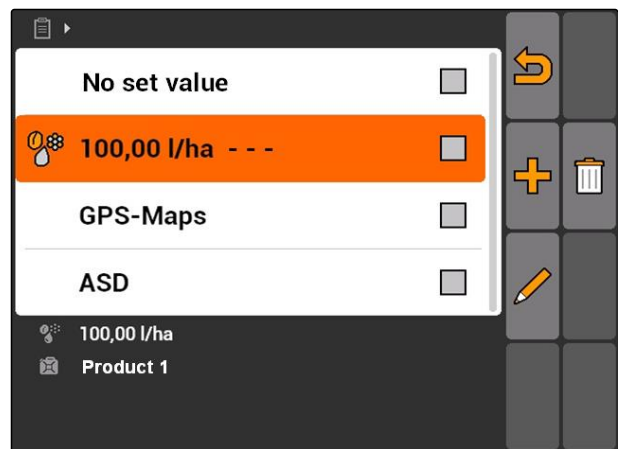


CMS-I-001730

- The menu for selecting the setpoint will be opened. The setpoints created in the master data will be shown.

NOTE

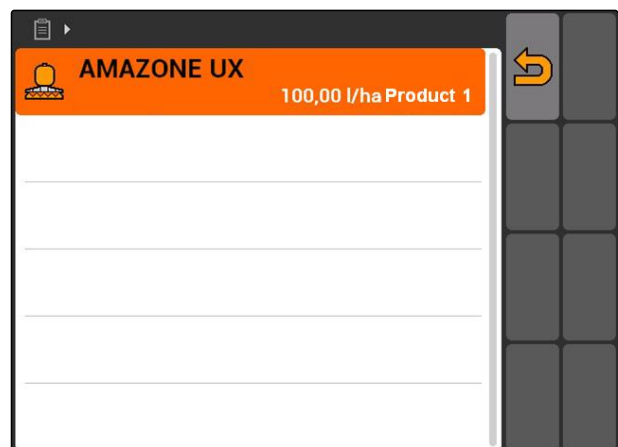
If no setpoints are available, the AMATRON 3 automatically opens the menu for creating a setpoint. In this case, see page 68.



CMS-I-001739

4. Select the desired setpoint from the list.

- The selected setpoint is assigned to the controllable implement element.



CMS-I-001743

10.2.3 Adding a worker to a job

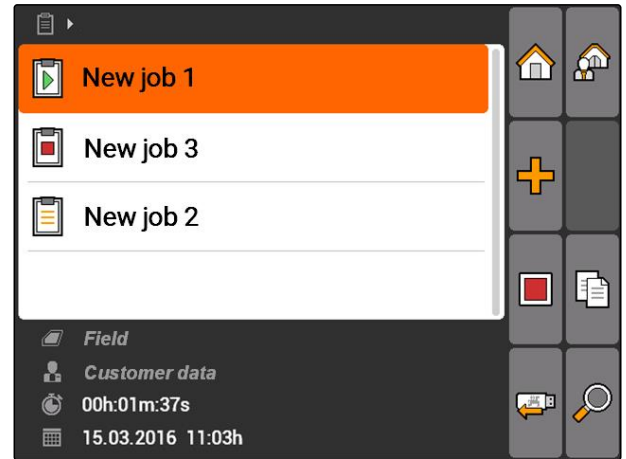
CMS-T-004382-B.1

Workers can be assigned to a job to record the working time for this worker.


✓ REQUIREMENTS

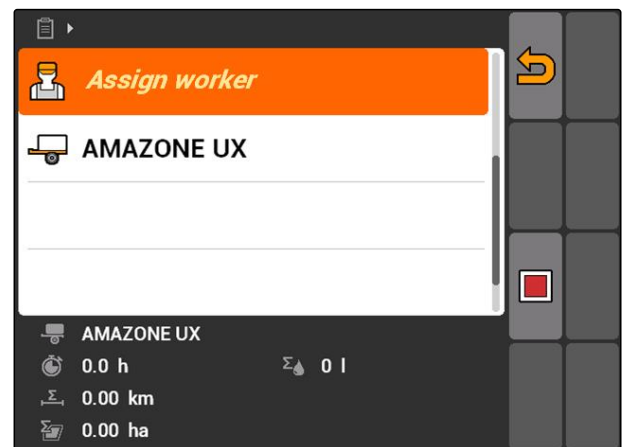
- ✓ Worker is created in the master data, see page 67
- ✓ Job is started, see page 64

1. Select "Jobs" > Started job.




CMS-I-002248


2. select .





CMS-I-001494



➔ The "Assign worker" menu will be opened. The already assigned workers will be shown.

: Working time recording started

: Working time recording stopped

: Opens the selected job

: Adds a new worker

 or : Starts or stops the working time recording for the selected worker(s)



CMS-I-001489

3. To add a worker:

select .

4. Select the desired worker from the list.

➔ The selected worker will be added to the job.



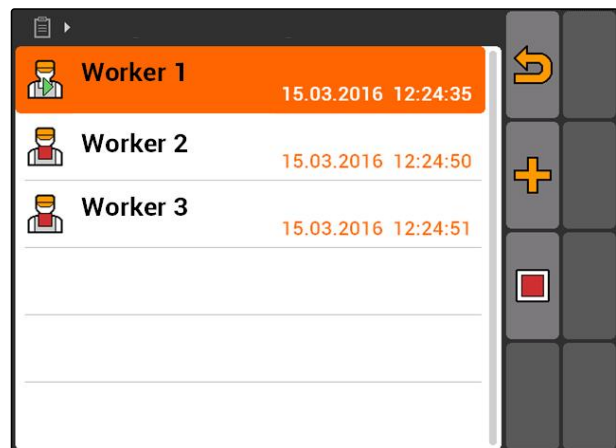
CMS-I-001747

5. To start the working time recording for a worker:

select .

6. To stop the working time recording for a worker:

select .



CMS-I-001751

10.2.4 Adding implements and tractors to a job

CMS-T-004387-A.1

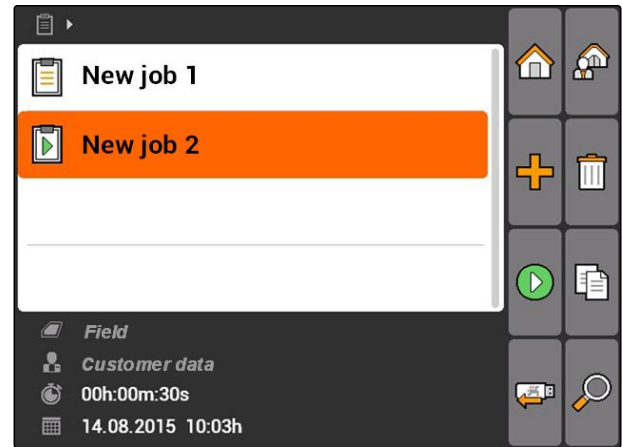
Implements and tractors can be assigned to a job to record the working time for these implements and tractor.



REQUIREMENTS

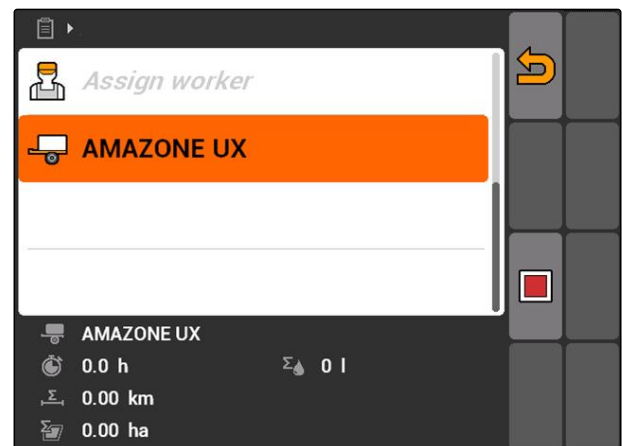
- ✓ Implement is configured, see page 42
- ✓ Tractor is configured, see page 47
- ✓ Job is started, see page 64

1. Select "Jobs" > Started job.



CMS-I-002082

2. select .



CMS-I-002324

➔ The "Implement assignment" menu will be opened. The already assigned implements and tractors will be shown.



: Working time recording started



: Working time recording stopped




: Opens the selected job



: Opens the menu with the selectable implements and tractors



or : Start or stop the working time recording for the selected implement or the selected tractor



CMS-I-001613

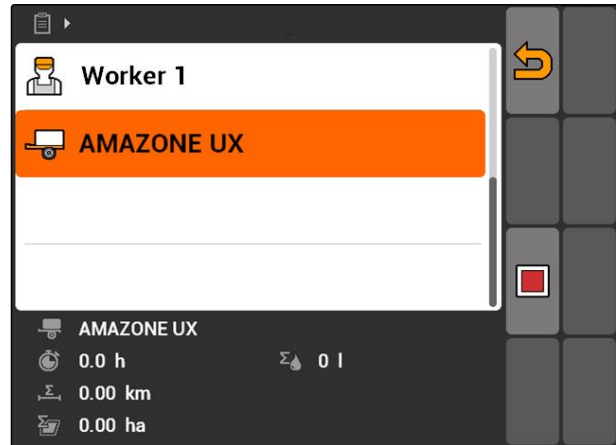
3. To add an implement or a tractor:

select .

➔ The menu with the selectable implements and tractors will be shown.

4. Select the desired implement or desired tractor from the list.

➔ The selected implement or tractor will be added to the job.



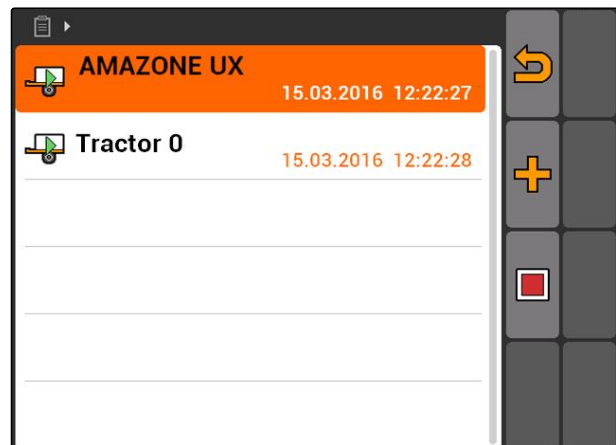
CMS-I-001617

5. To start the working time recording for an implement or a tractor:

select .

6. To stop the working time recording for an implement or a tractor:

select .

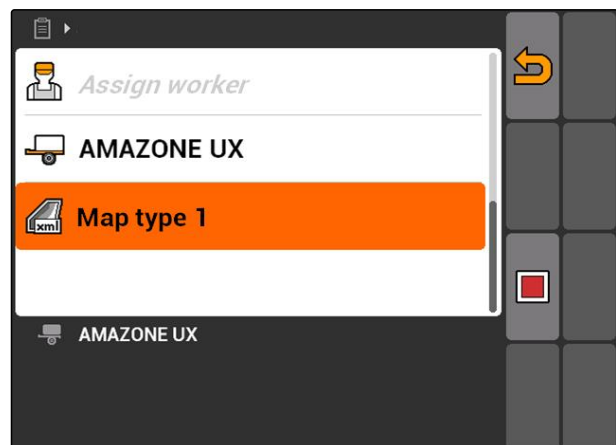


CMS-I-001613

10.2.5 Checking the map type

If a job with an application map in ISO-XML format was imported from the Farm Management Information System to the AMATRON 3, the map type is shown here.


- Map type 1: The application map is displayed in GPS switch and the setpoints are processed.
- Map type 2: The application map is not displayed in GPS switch, but the setpoints are processed.

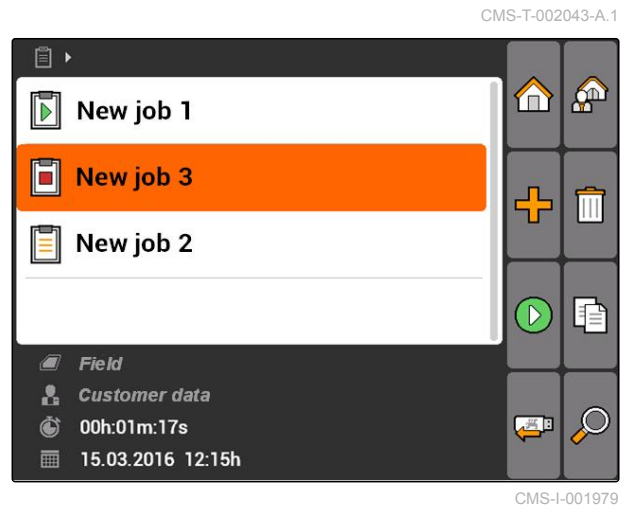


CMS-I-002065



10.2.6 Searching for jobs


1. Select Jobs > .
 2. Enter the search term.
 3. Confirm the entry.
- ➔ The found jobs are displayed.

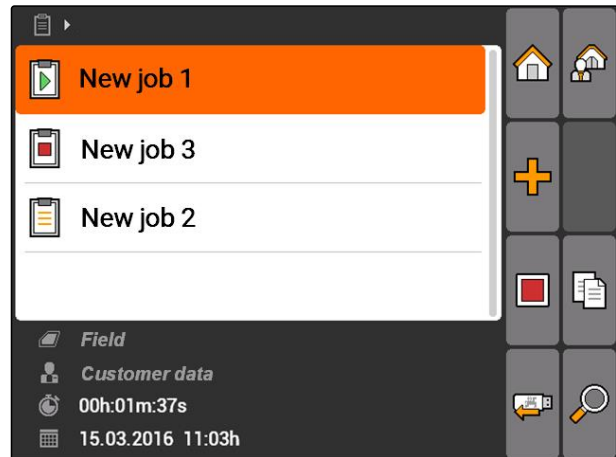


10.2.7 Copying jobs

To process jobs with the same data several times, the jobs can be copied.

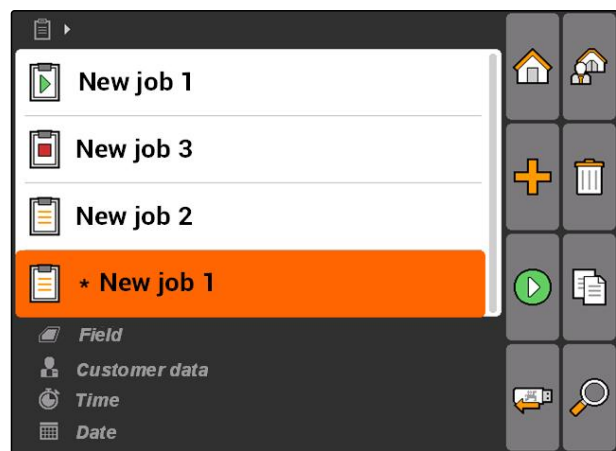
CMS-T-002051-A.1

1. "Jobs" > Select a job.
2. select .
3. Confirm the copying.



CMS-I-002248

➔ The job will be copied and marked with a "*".




CMS-I-001983

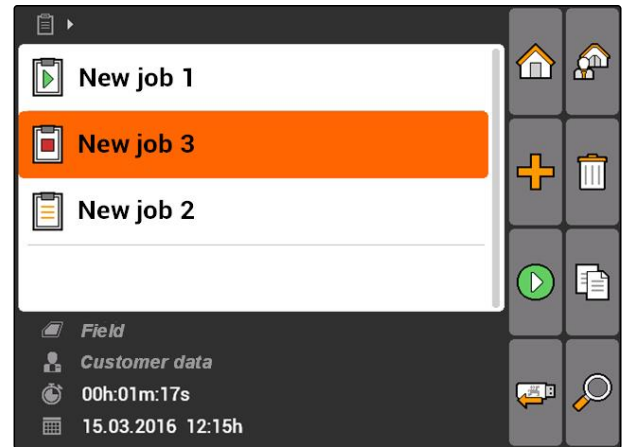
10.2.8 Starting a job

CMS-T-001583-A.1

When a job is started, the job data is recorded. The field data stored in the job are shown on the map in GPS switch.

- ✓ REQUIREMENTS**
- ✓ Job is imported or created:
 - Importing jobs, see page
 - Creating jobs, see page 55

1. "Jobs" > Select a job.
 2. select .
- ➔ The selected job will be started.




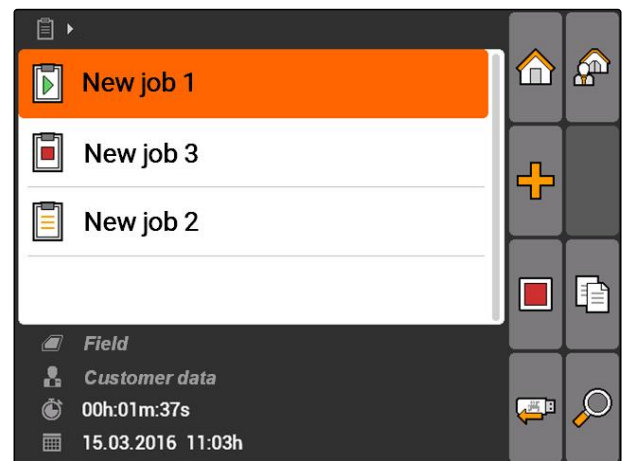
CMS-I-001979

10.2.9 Stopping a job

CMS-T-001589-A.1

When a job is stopped, the job data is no longer recorded.

1. "Jobs" > Select the current job.
 2. select .
- ➔ The selected job will be stopped.



CMS-I-002248

10.2.10 Exporting jobs


CMS-T-002056-A.1

Exported jobs are saved to the USB flash drive. The exported jobs can then be further processed with a Farm Management Information System (FMIS).

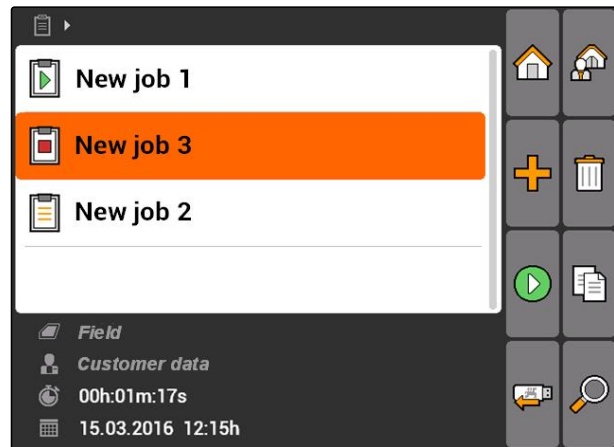


REQUIREMENTS

- ✓ USB flash drive is inserted

► Select "Jobs" > .

→ All of the jobs will be exported and saved to the USB flash drive.



CMS-I-001979

10.3

Using master data management

CMS-T-00004678-A.1


10.3.1 Managing master data

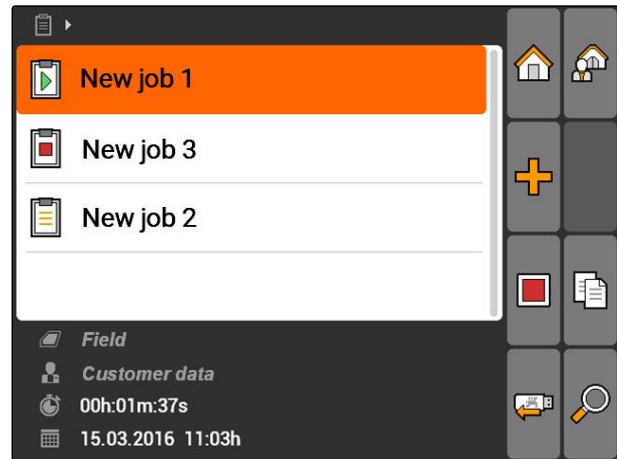
CMS-T-00004699-A.1

Master data is additional information that can be created and saved on the AMATRON 3. The created master data can be added to jobs. Master data from a Farm Management Information System (FMIS) cannot be edited.

The master data includes the following information:

- Setpoints for application/spread rates:
- Field data
- Customer data
- Worker data
- Product data

► Select "Jobs" > .



CMS-I-002248


➔ The "Master data" menu will be opened.

Possible settings:

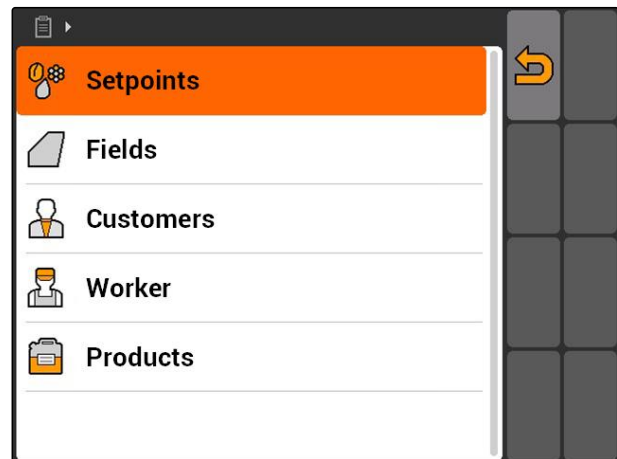
: Manage the "Setpoints", see page 67

: Manage the "Fields", see page 69

: Manage the "Customers", see page 70

: Manage the "Workers", see page 71

: Manage the "Products", see page 72



CMS-I-001240

NOTE

The fields marked with a "*" are mandatory, and must be filled in. Examples of mandatory fields are "Setpoints" or "Family name".


10.3.2 Managing setpoints


CMS-T-002435-B.1


Controllable implement elements can be assigned with setpoints. For example, the application rate for a sprayer and the spread rate for a spreader or seed drill can be defined.

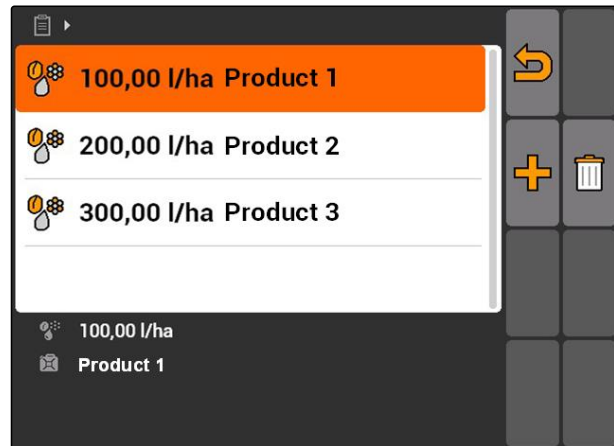
- Select "Jobs" >  > "Setpoints".

Setpoint menu overview

 : Opens the master data menu

 : Adds a setpoint

 : Deletes the selected setpoint



CMS-I-001461

10.3.3 Editing the setpoints

CMS-T-003930-A.1

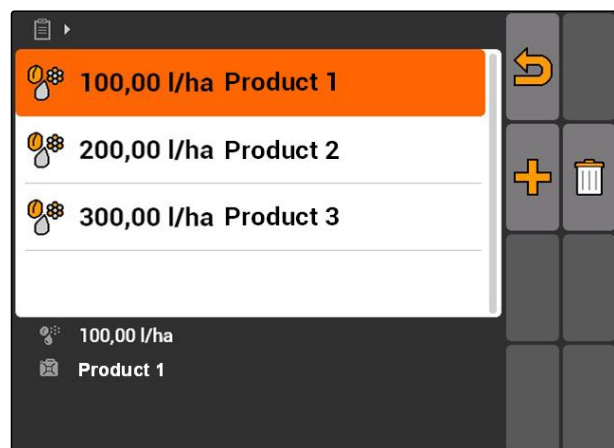
Setpoints can consist of several products to document which product was used for the job.

To group setpoints from different products, the products must be created, see page 72.

1. Select a setpoint from the list

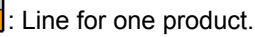
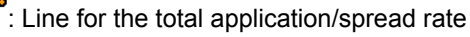
or

Add a new setpoint.



CMS-I-001461

- ➔ The "Setpoint" menu will be opened.



CMS-I-001465

2. Enter the setpoints for the product in the first column.
3. In the second column, enter the units for the setpoints.
4. In the third column, select the products.

NOTE


In the product selection menu, products can also be created and edited, see page 73.


5. Confirm entries.
- ➡ The total application/spread rate and the units are transmitted to the implement. In this example, "Product 1": 500 l/ha.


10.3.4 Managing fields


CMS-T-002445-B.1


Fields can be created to document which fields were worked in the respective jobs.

- Select "Jobs" >  > "Fields".

: Opens the master data menu

: Adds a field

: Deletes the selected field

: Opens the search function; see page 63



CMS-I-002257

10.3.5 Editing the field data

CMS-T-002252-A.1

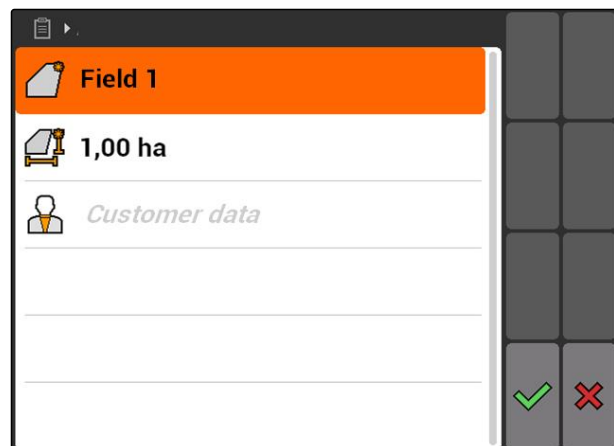
1. Select a field from the list

or

Add a new field.

- ➔ The "Field data" menu will be opened.

2. Enter data and confirm.



CMS-I-001219

10.3.6 Managing the customers

CMS-T-002440-B.1

Customer data can be added to jobs. This enables the documentation of the customers for whom the respective jobs were processed.

- Select "Jobs" >  > "Customers".

Customer menu overview

- 1 Existing customers
- 2 Information on the selected customer



: Opens the master data menu



: Adds a customer



: Deletes the selected customer



: Opens the search function



CMS-I-002024

10.3.7 Editing the customer data

CMS-T-003400-A.1

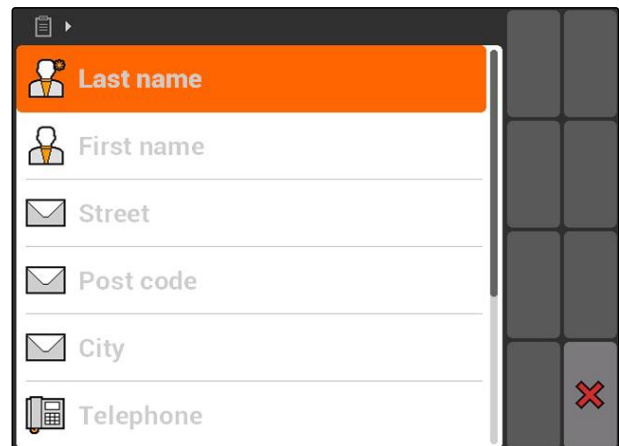
1. Select a customer from the list

or

Add a new customer.

- ➔ The "Customer data" menu will be opened.

2. Enter the customer data.
3. Confirm entries.




CMS-I-001291

10.3.8 Managing workers

CMS-T-002450-B.1

Worker data can be added to jobs. This enables the documentation of the working time for each worker.

- Select "Jobs" >  > "Worker".

Worker menu overview



: Opens the master data menu



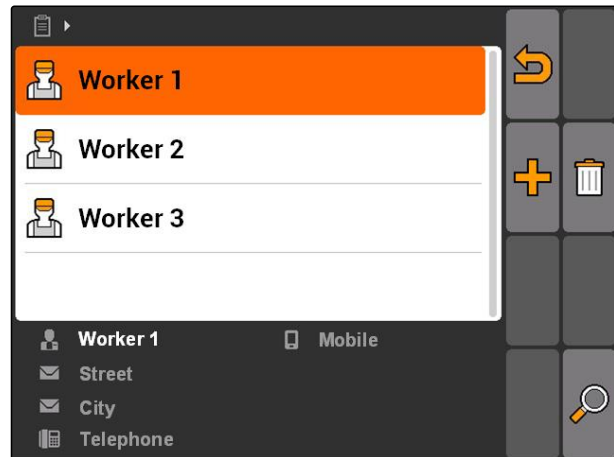
: Adds a worker



: Deletes the selected worker



: Opens the search function



CMS-I-001500

10.3.9 Editing worker data

CMS-T-003415-A.1

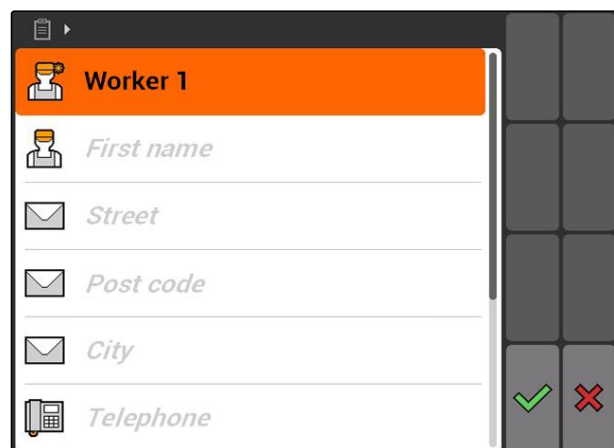
1. Select a worker from the list

or

Add a new worker.

- ➔ The "Worker data" menu will be opened.

2. Enter the worker data.
3. Confirm entries.



CMS-I-001297

10.3.10 Managing products

CMS-T-002461-B.1

Products can be added to the setpoints. This enables the documentation of quantities used for each product.

► Select "Jobs" >  > "Products".

Product menu overview



: Opens the master data menu



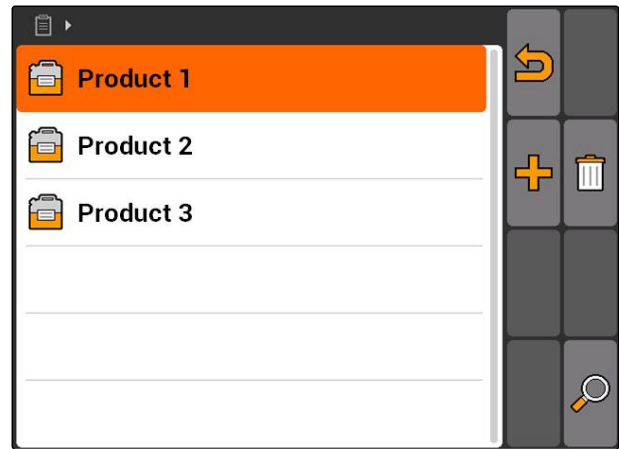
: Adds a product



: Deletes the selected product



: Opens the search function



CMS-I-001305

10.3.11 Editing the product data

CMS-T-003475-A.1

1. Select a product from the list

or

Add a new product.

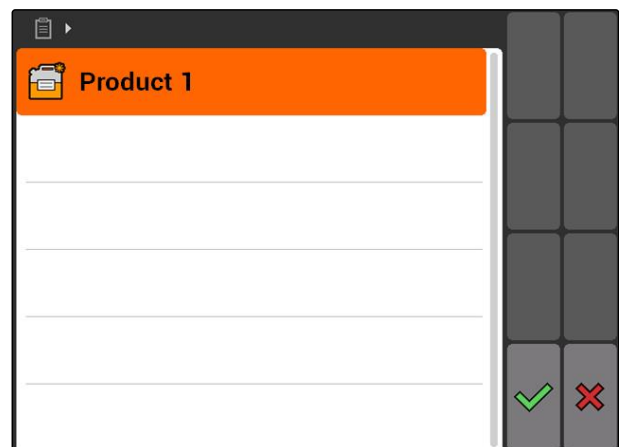
➔ The "Product data" menu will be opened.

2. Enter data and confirm.



NOTE

A product can only be assigned to a product group if data for the product groups was created in a Farm Management Information System. This data is automatically loaded from the USB flash drive.



CMS-I-001301

Using the GPS switch

11

CMS-T-006135-D.1

11.1

GPS switch overview

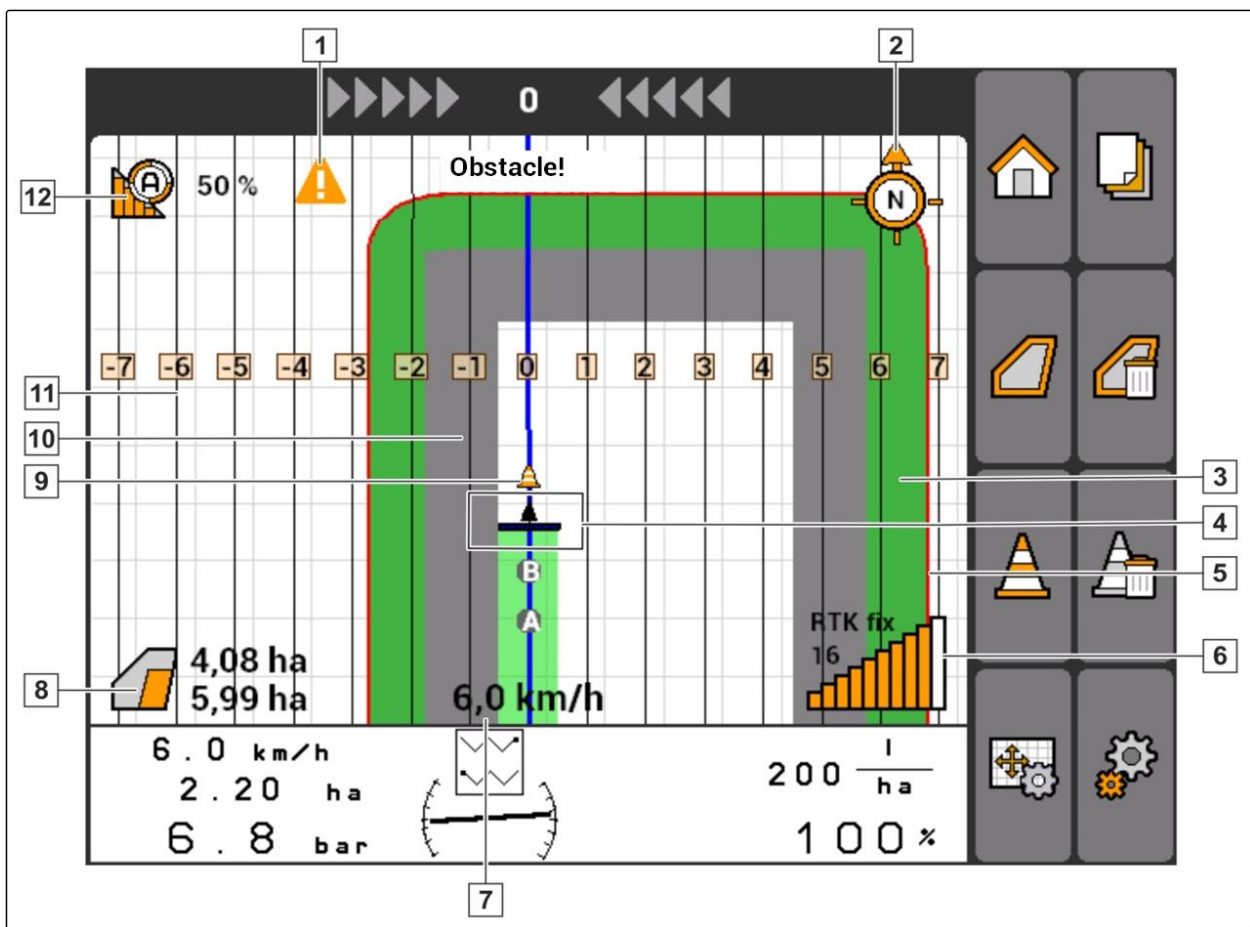
CMS-T-00004684-B.1

11.1.1 GPS switch interface

CMS-T-00004685-B.1

11.1.1.1 Symbols on the map

CMS-T-005238-A.1

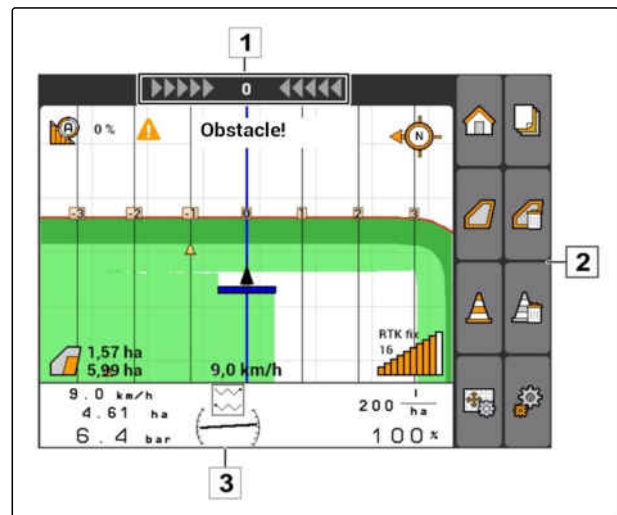


CMS-I-002037

- | | |
|--|--|
| <p>1 Field boundary warning</p> <p>2 Compass</p> <p>3 Worked area in light green, double-worked areas in dark green</p> <p>4 Tractor symbol and implement symbol</p> <p>5 Field boundary in red</p> <p>6 Correction source, number of satellites and GPS signal strength</p> | <p>7 "GPS" speed</p> <p>8 Worked area and remaining area</p> <p>9 Obstacle</p> <p>10 "Virtual" headlands in grey</p> <p>11 Track line with track line number</p> <p>12 Mode for the part-width section control</p> |
|--|--|

11.1.1.2 Display outside of the map

- 1** Track line deviation in centimetres, arrow symbols for the direction and amplitude of the track line deviation
- 2** Buttons for the GPS switch menu
- 3** Implement information



11.1.1.3 GPS switch menu

CMS-T-005248-B.1

Page 1




: Opens the main menu




: Changes between Page 1 and Page 2



starts and  stops the recording for a manual implement



starts and  stops the recording for an ISOBUS or AMABUS implement



: Opens the "Field data" menu



or : Create the start point and end point for track lines or delete the track lines



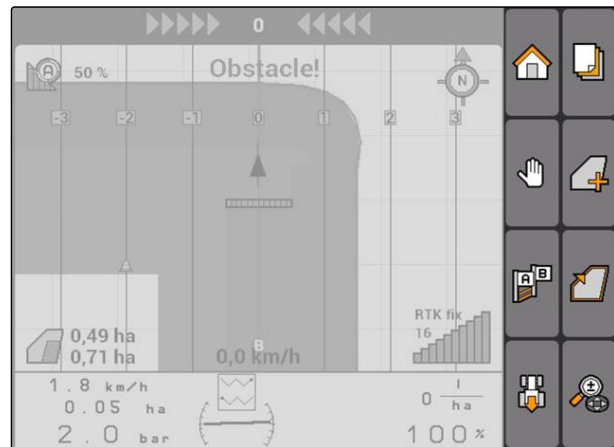
or : Create field boundary or delete field boundary



or : Rotates the vehicle symbol



or : Switch between zoom and map panning



CMS-I-001538

Page 2



: Creates the virtual headland and enables it.



: Enables the working of the inside of the field and blocks the virtual headland



: Deletes the "virtual" headland



: Creates an obstacle



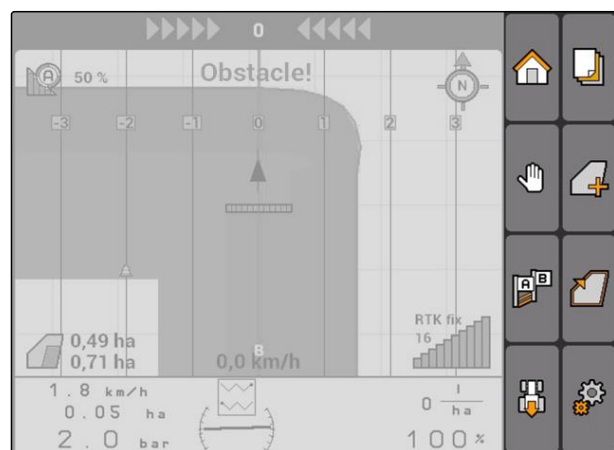
: Deletes the obstacle



: Opens the GPS switch calibration



: Opens the GPS switch settings



CMS-I-001542

11.1.1.4 Error symbols



No job data available. Create job data, see page



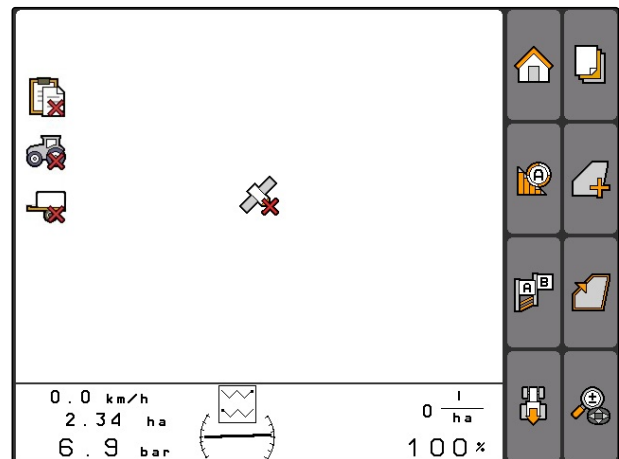
No Tractor-ECU available, create tractor, see page 47



No implement available, create implement, see page 42



No GPS signal available, configure the GPS, see page



CMS-T-005233-A.1

CMS-I-001543

11.1.2 GPS switch functions

CMS-T-00004686-A.1

11.1.2.1 Automatic part-width section control

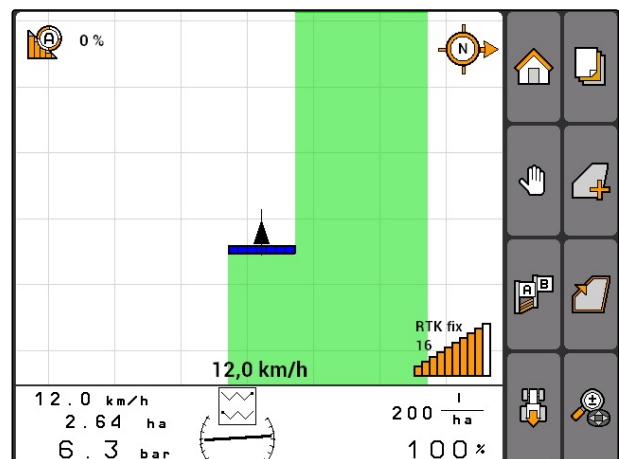
When the part-width sections of the connected implement are switched on, the worked area is marked in green on the map of the AMATRON 3. To achieve optimal coverage, the AMATRON 3 can automatically switch the part-width sections of the connected implement on and off. To do so, the AMATRON 3 uses the GPS signal from the connected GPS receiver.



NOTE

The connected receiver must send the following messages to the terminal:

- GGA
- GSA
- VTG



CMS-T-004862-A.1

CMS-I-001528

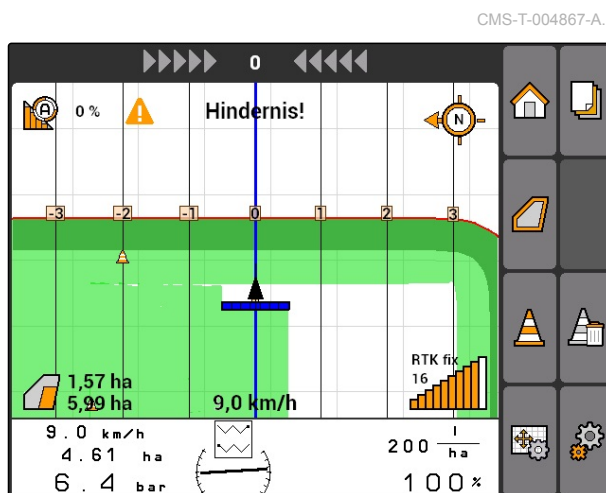
For automatic part-width section control, the following settings are available:

- Degree of overlap of 0%, 50% or 100%
- Overlap tolerances up to 25 cm
- Overlap tolerances at the field boundary up to 25 cm
- Overlaps or underlaps in the direction of travel from -1000 cm to +1000 cm

11.1.2.2 Track guidance with GPS track

The following track line patterns are available:

- To ensure that the driver can follow the track lines reliably, the light bar is shown at the top edge of the map. The light bar consists of triangular symbols that show the deviation from the track. This enables the driver to countersteer accordingly.



CMS-I-001529

NOTE

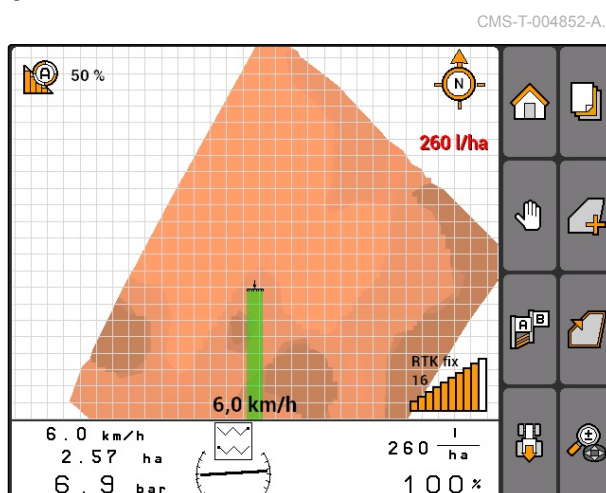
This application is activated for a period of use of 50 hours. To be able to use the application without restrictions, a license key must be purchased from AMAZONE.

11.1.2.3 Variable rate control with GPS maps

GPS maps enables importing and use of application maps in shape format. Application maps can be used to control an element of a connected implement. For example, the application rates for a sprayer and the spread rates for a spreader or seed drill can be controlled.

NOTE

To be able to use this function without restrictions,
a license key must be purchased from
AMAZONE.



CMS-I-001530

11.1.3 GPS quality requirements

CMS-T-006650-A.1

		GPS quality
DGPS	0 to 6 (nominal 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: Worked area is shown in green
- Medium quality: Worked area is shown in yellow
- Poor quality: GPS too imprecise. The field is no longer displayed on the GPS switch.

11.2


Entering the basic settings for GPS switch

CMS-T-00004680-A.1

11.2.1 Defining the implement modelling

CMS-T-003460-A.1

The specification of the implement modelling is required to simulate the different following characteristics of the implements.

- Select "GPS switch" >  > "Implement modelling".

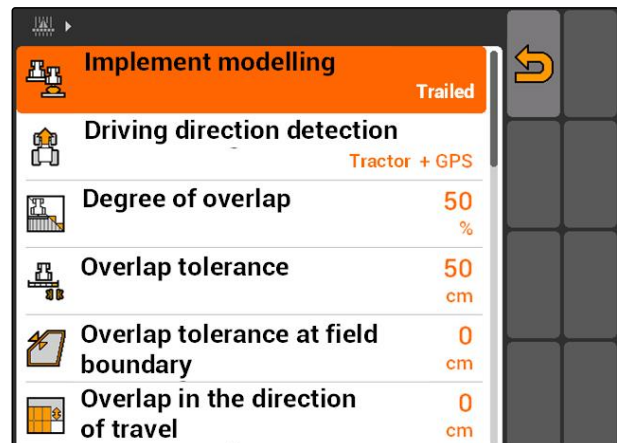
Possible settings:

- "Mounted": For mounted implements and self-propelled machines without four-wheel steering
- "Towed": For implements with a drawbar
- "Self-propelled machine": For self-propelled machines with four-wheel steering



NOTE

If "Towed" is selected for the implement modelling, the value "X2" must be entered for AMABUS implements or manual implements in the implement geometry data, see page 44.




CMS-I-001651

11.2.2 Select the source for the driving direction detection

CMS-T-003480-A.1

The driving direction detection ensures that the tractor symbol does not turn around when the tractor drives in reverse. Different sources are possible for the driving direction detection. If the sources do not provide the correct driving direction detection, the driving direction detection can be switched off.

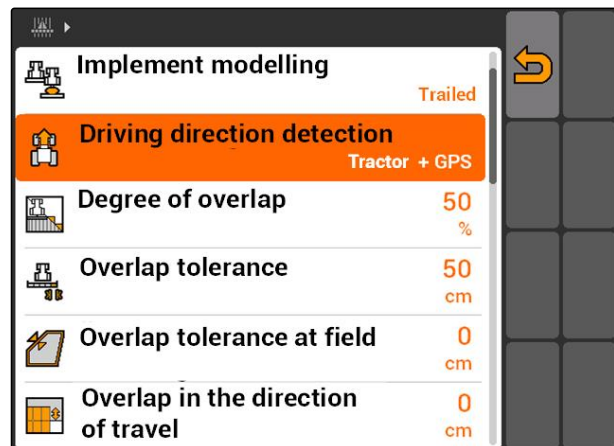
- Select "GPS switch" >  > "Driving direction detection".

Possible settings:

- "Off"
- "GPS"
- "Tractor+GPS: Provides a driving direction signal to the tractor, if this is used. If not, the GPS signal is used."

NOTE

The orientation of the tractor symbol can be turned around manually; see page 96. If the tractor sends a reverse driving signal, the "Turn around direction" function is not available.




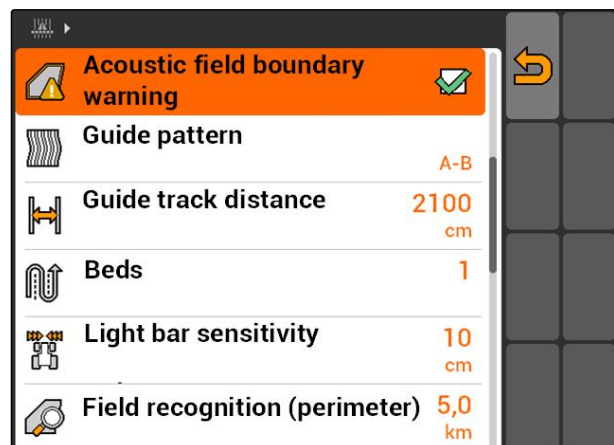
CMS-I-001647

11.2.3 Enabling the acoustic field boundary warning

CMS-T-003430-A.1

When the vehicle approaches the field boundary, the AMATRON 3 can issue a warning tone.

- Select "GPS switch" >  > "Acoustic field boundary warning".




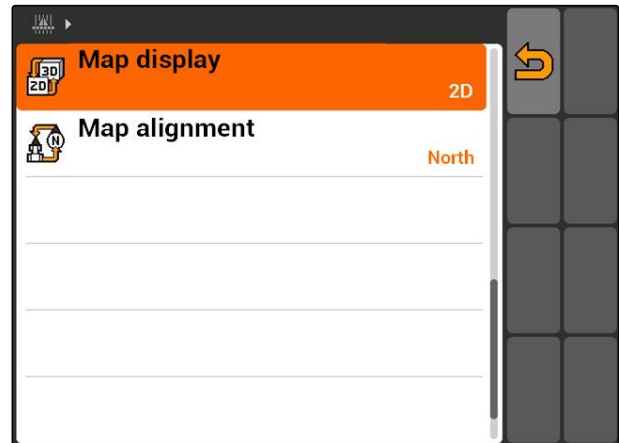
CMS-I-001655

11.2.4 Defining the map display

CMS-T-003405-A.1

The map in GPS switch can be displayed in two or three dimensions.

1. Select "GPS switch" >  > "Map display".
2. Select the desired map display.




CMS-I-001826

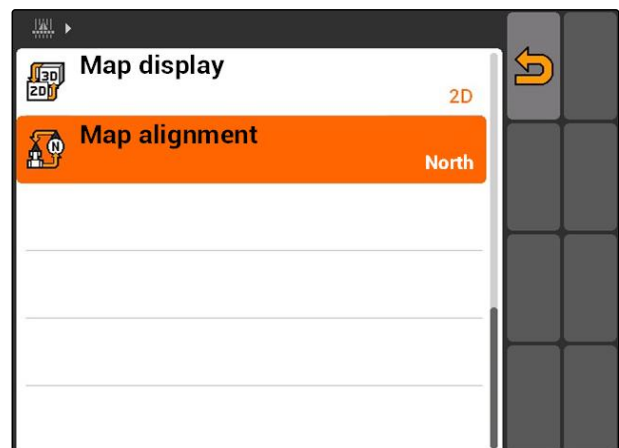
11.2.5 Defining the map alignment

CMS-T-003395-A.1

There are 2 possible settings for the map alignment:

- "Driving direction": The map rotates together with the vehicle. The compass on the map shows the current driving direction.
- "North": The map always has the same orientation.

1. Select "GPS switch" >  > "Map alignment".
2. Select the desired map alignment.



CMS-I-001817

11.2.6 Entering the GPS switch settings for spreaders

CMS-T-00004681-A.1

11.2.6.1 Automatically creating a safety zone

CMS-T-006129-A.1

This function defines whether a safety zone is automatically created inside a field boundary.




REQUIREMENTS

For AMABUS spreaders:

- ✓ Spreader is connected
- ✓ The AMATRON 3 is started in AMABUS mode, see page 15
- ✓ Spreader is selected in the implement menu, see page 45

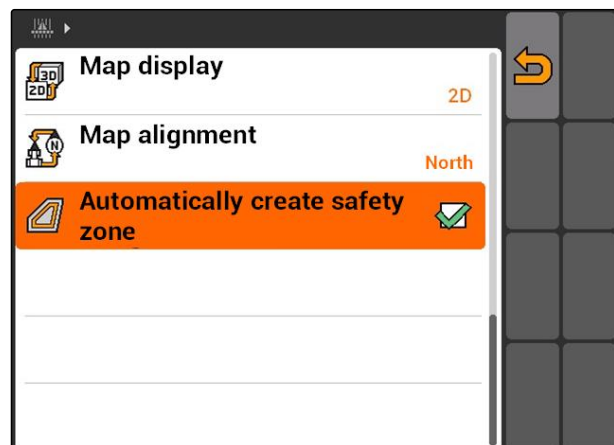
For ISOBUS spreaders:

- ✓ Spreader is connected
- ✓ The AMATRON 3 is started in ISOBUS mode, see page 15

- Select "GPS switch" >  > "Automatically create safety zone".

Possible settings:

- ☒ : When a field boundary is created, a safety zone is automatically created.
- ☐ : When a field boundary is created, a query is shown as to whether a safety zone should be created.

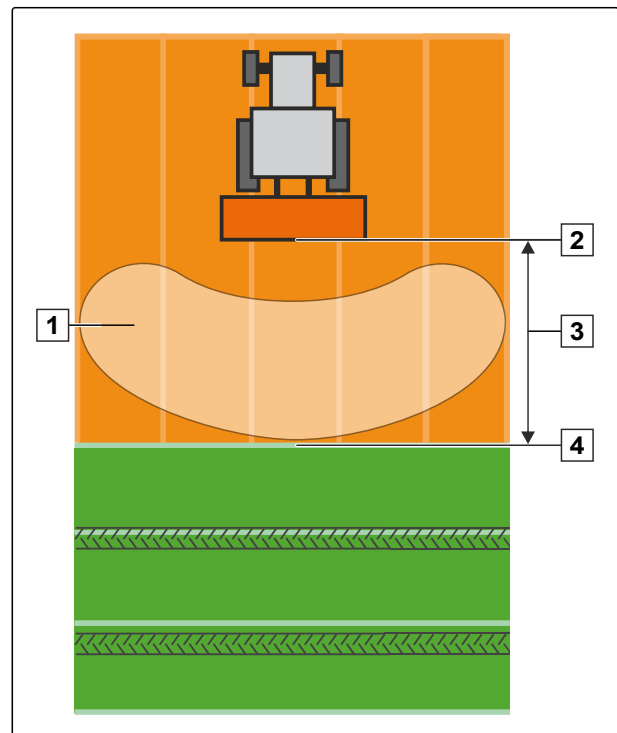


CMS-I-002113

11.2.6.2 Setting the headland distance

CMS-T-006119-A.1

The headland distance **3** is the distance between the headland boundary **4** and the application point of the spreader **2**. The spreading can only be started once the application point of the spreader has reached the defined headland distance. When the headland distance is correctly set, it prevents the spread fan **1** from reaching into the headlands.



CMS-I-002104




REQUIREMENTS

For AMABUS spreaders:

- ✓ Spreader is connected
- ✓ The AMATRON 3 is started in AMABUS mode, see page 15
- ✓ Spreader is selected in the implement menu, see page 45
- ✓ The geometry values for the spreader were correctly entered, see page 44

For ISOBUS spreaders:

- ✓ Spreader is connected
- ✓ The AMATRON 3 is started in ISOBUS mode; see page 15

1. Select "GPS switch" >  > "Headland distance".
2. Enter the desired headland distance and confirm.

11.2.7 Entering the GPS switch settings for sprayers

CMS-T-00004682-A.1

11.2.7.1 Setting the automatic boom lowering

CMS-T-006124-A.1

The automatic boom lowering automatically lowers the boom when the sprayer moves onto an unworked area.



NOTE

The value to be entered refers to the duration of the lowering procedure.

The correct timing of the automatic boom lowering function depends on the following factors:

- Forward speed
- Tractor equipment
- Implement equipment
- Lifting distance of the boom

The value for the duration of the lowering procedure must be determined manually.




REQUIREMENTS

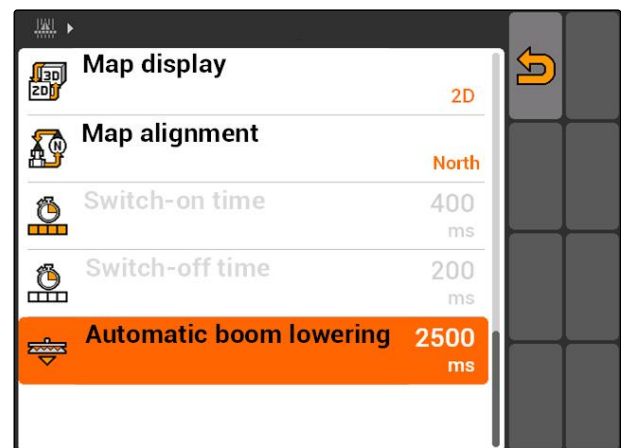
For AMABUS sprayers:

- ✓ The sprayer is connected
- ✓ The AMATRON 3 is started in AMABUS mode, see page 15
- ✓ Sprayer is selected in the implement menu, see page 45
- ✓ Field boundary has been created, see page 98

For AMAZONE ISOBUS sprayers:

- ✓ The sprayer is connected
- ✓ The AMATRON 3 is started in ISOBUS mode, see page 15
- ✓ Field boundary has been created, see page 98

1. Select "GPS switch" >  > "Automatic boom lowering".
2. Enter the duration of the lowering procedure in milliseconds and confirm.



CMS-I-002017

11.2.8 Entering the GPS switch settings for seed drills

CMS-T-00004683-A.1

11.2.8.1 Configuring the driver assistance system

CMS-T-006114-A.1

The driver assistance system supports the driver in working the field seamlessly. Switching delays of the seed drill and uneven forward speeds can cause overlap or underlap in the seed rows. The driver assistance system notifies the driver with a signal tone and a symbol that the vehicle is approaching the switch point and that the forward speed must be kept constant.

The value to be entered defines the distance between the implement and the switch point at which the driver assistance system is enabled.

Possible switch points:

- Field boundary
- Headland boundary
- Boundary between the worked and unworked areas



NOTE

For more information on how the driver assistance system is used, see page 124.




REQUIREMENTS

For AMABUS seed drills:

- ✓ Seed drill is connected
- ✓ The AMATRON 3 is started in AMABUS mode, see page 15
- ✓ Seed drill is selected in the implement menu, see page 45

For ISOBUS seed drills:

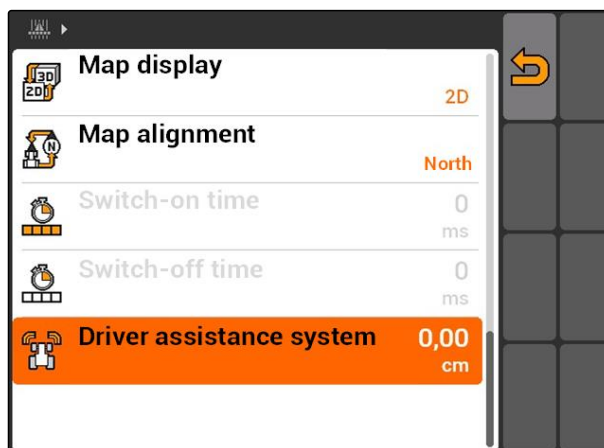
- ✓ Seed drill is connected
- ✓ The AMATRON 3 is started in ISOBUS mode, see page 15

1. Select "GPS switch" >  > "Driver assistance system".

2. Enter the desired distance and confirm

or

If the driver assistance system should be disabled,
enter "0" and confirm



CMS-I-001726

11.2.9 Setting the on/off point delays

CMS-T-005059-A.1

When the part-width sections are switched on **1**, it takes a few hundred milliseconds until the application/spreading actually starts **2**. The switch-on delay **3** can cause underlaps in working the field. When the part-width sections are switched off, it also takes several hundred milliseconds until the application/spreading actually stops. This switch-off delay can cause overlaps in working the field.

The on/off point delays compensate for these delays with switching the part-width sections on and off.



NOTE

The on/off point delays can only be set for AMABUS seed drills and AMABUS sprayers.



NOTE

The "On point delay" must be set such that the application/spreading starts precisely and therefore avoids underlaps.

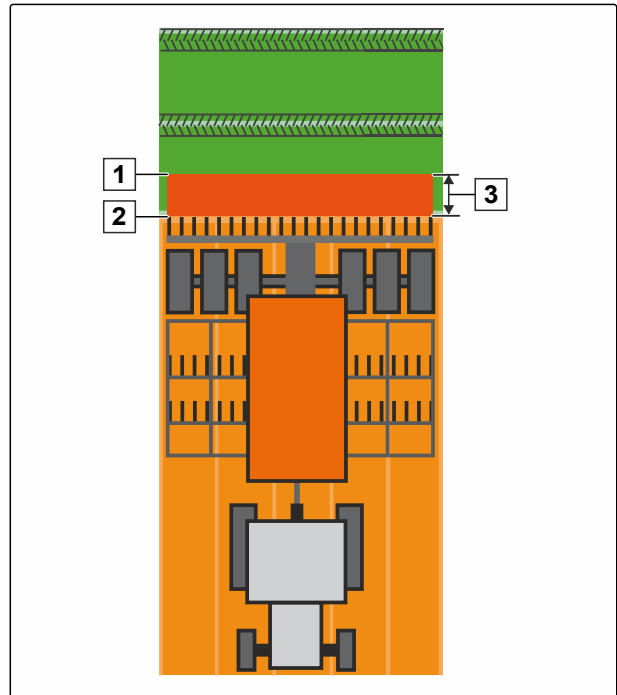
The "Off point delay" must be set such that the application/spreading stops precisely and therefore avoids overlaps.

Boundaries for starting and stopping the application/spreading:

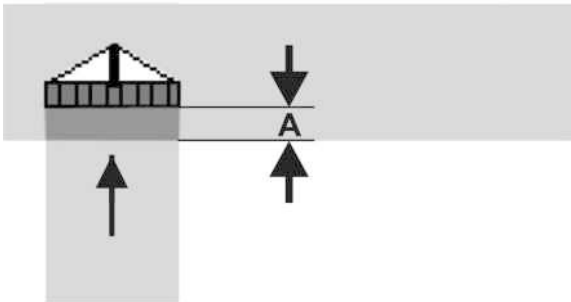
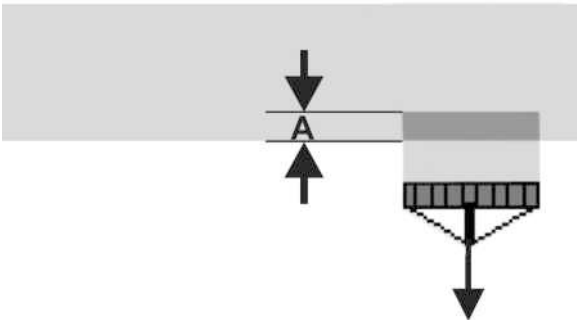
- Boundary from the worked to unworked area
- Field boundary
- Headland boundary

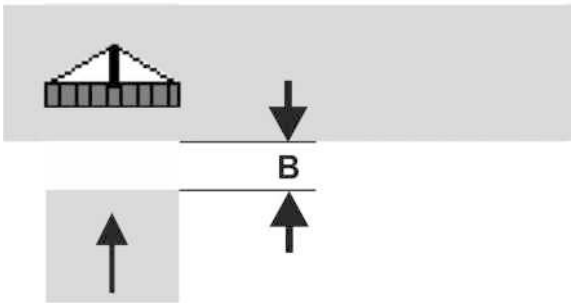
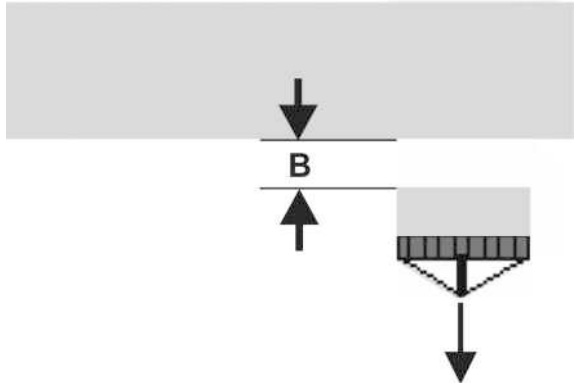
If there are undesired overlaps or underlaps, the correct on/off point delays can be taken from a table or determined with a formula; see page 90.

Desired overlaps or underlaps can be defined in the "Overlap in the direction of travel" setting, see page 116.



CMS-I-002116


On/off point delay for switching off	On/off point delay for switching on
 <p style="text-align: right;">CMS-I-001618</p>	 <p style="text-align: right;">CMS-I-001810</p>
(A) Length of the overlap	
Switching off: Entering a worked area <ul style="list-style-type: none"> • Sprayer: Reduce the on/off point delay • Seed drill: Increase the on/off point delay 	Switching on: Moving off a worked area <ul style="list-style-type: none"> • Sprayer: Reduce the on/off point delay • Seed drill: Reduce the on/off point delay

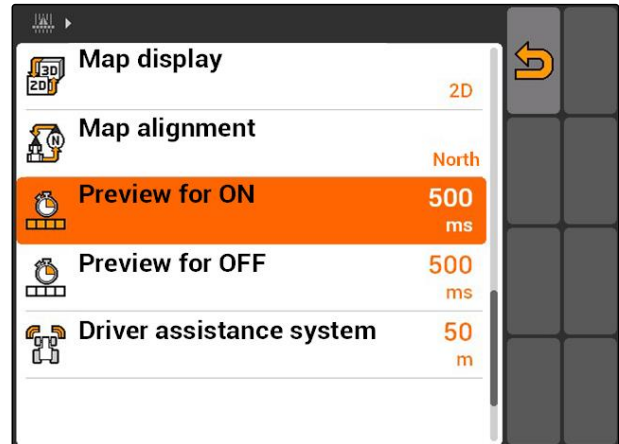
On/off point delay for switching off	On/off point delay for switching on
 <p style="text-align: right;">CMS-I-002027</p>	 <p style="text-align: right;">CMS-I-002028</p>
(B) Length of the unworked area	
Switching off: Entering a worked area <ul style="list-style-type: none"> • Sprayer: Increase the on/off point delay • Seed drill: Reduce the on/off point delay 	Switching on: Moving off a worked area <ul style="list-style-type: none"> • Sprayer: Increase the on/off point delay • Seed drill: Increase the on/off point delay




REQUIREMENTS

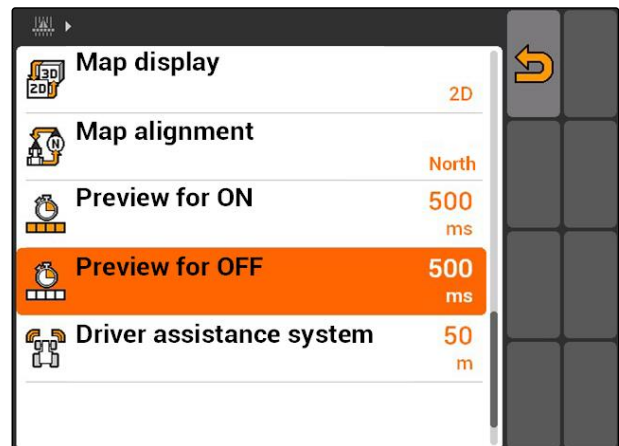
- ✓ AMABUS implement is connected
- ✓ The AMATRON 3 is started in AMABUS mode, see page 15
- ✓ AMABUS implement is selected in the implement menu, see page 45

1. Select "GPS switch" >  > "On/off point delay for ON".
2. Enter the determined on/off point delay.



CMS-I-002233

3. Select "GPS switch" >  > "On/off point delay for OFF".
4. Enter the determined on/off point delay.



CMS-I-002237

11.2.10 Determining the correction times for on/off point delays

CMS-T-006363-C.1

		Length of the overlap (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
Forward speed [km/h]	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) that are not listed can be interpolated, extrapolated or calculated using the following formula:

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

CMS-I-002149

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

- Delivery times depending on the seed type, conveyor section and the blower fan speed
- Driving behaviour depending on the forward speed, acceleration and braking
- GPS accuracy depending on the correction signal and update rate of the GPS receiver



NOTE

For precise switching at the headlands – especially for seed drills – the following points are absolutely necessary:

- RTK accuracy of the GPS receiver (update rate min. 5 Hz)
- Constant speed when driving in or out of the headlands



11.2.11 Checking the switch-on and -off times

CMS-T-004847-A.1

When the part-width sections are switched on, it takes a few hundred milliseconds until the application/spreading actually starts. The switch-on delay can cause underlaps in working the field. When the part-width sections are switched off, it also takes several hundred milliseconds until the application/spreading actually stops. This switch-off delay can cause overlaps in working the field.

The switching times compensate for these delays with switching the part-width sections on and off.



NOTE

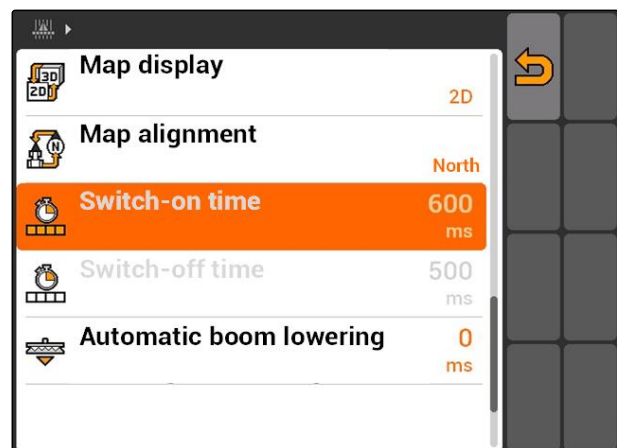
The switching times are only shown for ISOBUS seed drills and ISOBUS sprayers. The switching times can only be changed through the implement controls.



REQUIREMENTS

- ✓ ISOBUS implement is connected
- ✓ The AMATRON 3 is started in ISOBUS mode, see page 15

1. In the GPS switch settings, check the values for the "Switch-on time" and for the "Switch-off time".
2. *If the switching times are not correct,* change the switching times in the implement controls.



CMS-I-002108

11.3

Starting the GPS switch

CMS-T-00004702-A.1

11.3.1 Starting GPS switch with job management

CMS-T-005147-A.1

When job management is enabled, jobs in ISO-XML format can be imported and processed.



REQUIREMENTS

If GPS switch should be started with job management, the following requirements must be met:

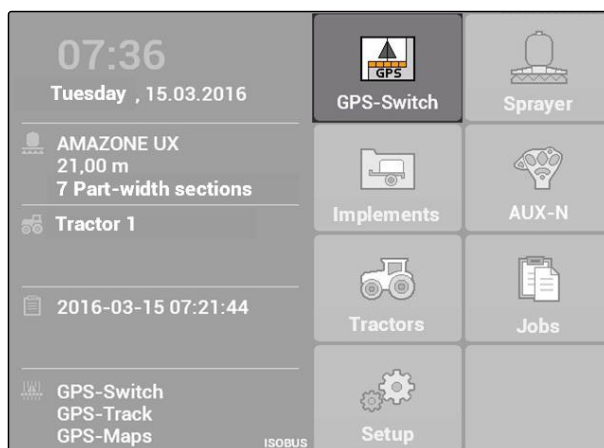
- ✓ GPS is configured; see page
- ✓ For ISOBUS implements and AMABUS implements: Implement is connected
- ✓ For ISOBUS implements: ISOBUS is properly configured, see page 24
- ✓ For AMABUS implements and implements that cannot communicate with the terminal: Implement is selected, see page 45
- ✓ The tractor is selected, see page 52
- ✓ Job management is enabled, see page 19
- ✓ USB flash drive is inserted
- ✓ Job in ISO-XML format is imported or created:
 - Importing jobs, see page
 - Creating jobs, see page 55
- ✓ Job is started, see page 64

► Select Main menu > "GPS switch".

➔ GPS switch will be started.

The following contents are shown on the GPS switch map.

- A tractor symbol
- An implement symbol
- The field boundary and application map created in the job



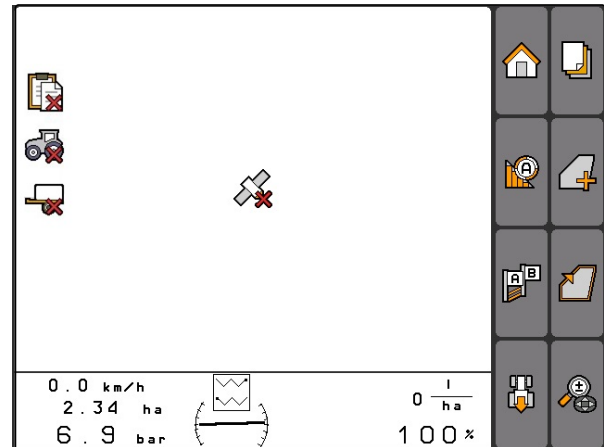
CMS-I-002167



TROUBLESHOOTING

Are the contents not being displayed on the GPS switch map?

The requirements for starting GPS switch have not been met. Error symbols are flashing on the GPS switch map.



CMS-I-001543

1. Check the requirements for starting GPS switch.
2. Restart GPS switch.

11.3.2 Starting GPS switch without job management

CMS-T-005152-A.1



REQUIREMENTS

If GPS switch should be started without job management, the following requirements must be met:

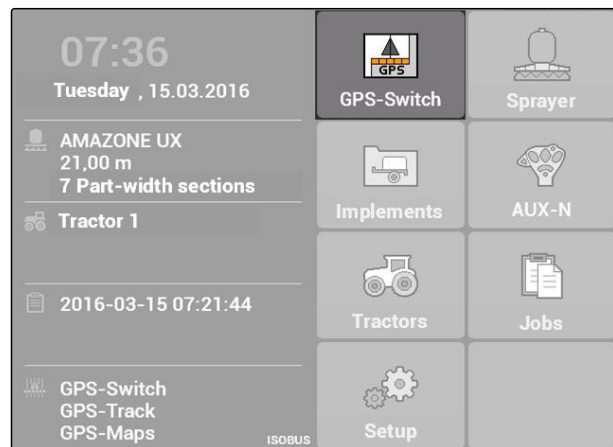
- ✓ GPS is configured; see page
- ✓ For ISOBUS implements and AMABUS implements: Implement is connected
- ✓ For ISOBUS implements: ISOBUS is configured, see page 24
- ✓ For AMABUS implements and implements that cannot communicate with the terminal: Implement is selected, see page 45
- ✓ The tractor is selected, see page 52
- ✓ Job management is disabled, see page 19

► Select Main menu > "GPS switch".

➔ GPS switch will be started.

The following contents are shown on the GPS switch map.

- A tractor symbol
- An implement symbol

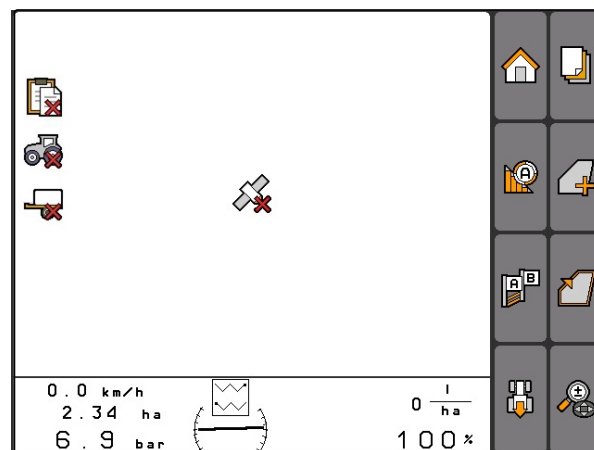


CMS-I-002167

? TROUBLESHOOTING

Are the contents not being displayed on the GPS switch map?

The requirements for starting GPS switch have not been met. Error symbols are flashing on the GPS switch map.



CMS-I-001543

1. Check the requirements for starting GPS switch.
2. Restart GPS switch.

11.4

Zooming the map

CMS-T-003545-A.1

The map is zoomed and panned with the directional pad. The GPS switch menu shows which of the two functions is currently active:

- Zoom
- Map panning

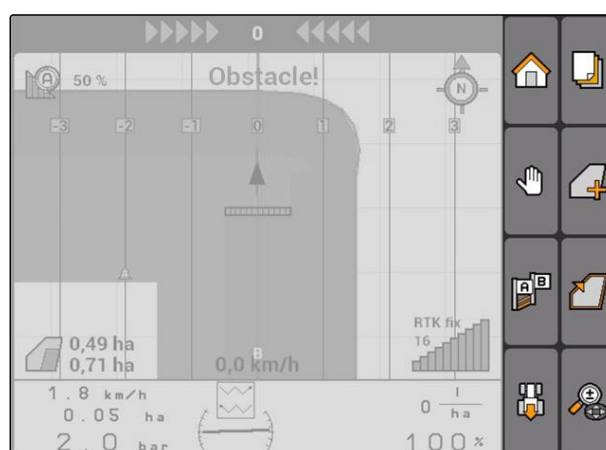
1. When map panning is active:




Select .

➔ The symbol for zooming is shown: .

2. To zoom the map in small increments,

press and .



3. To zoom the map in larger increments,
press  and .
4. To zoom the map back to the standard dimensions and to focus on the vehicle symbol,
Press .

11.5

Panning the map


CMS-T-001615-A.1

The map is zoomed and panned with the directional pad. The GPS switch menu shows which of the two functions is currently active:

- : Zoom
- : Map panning

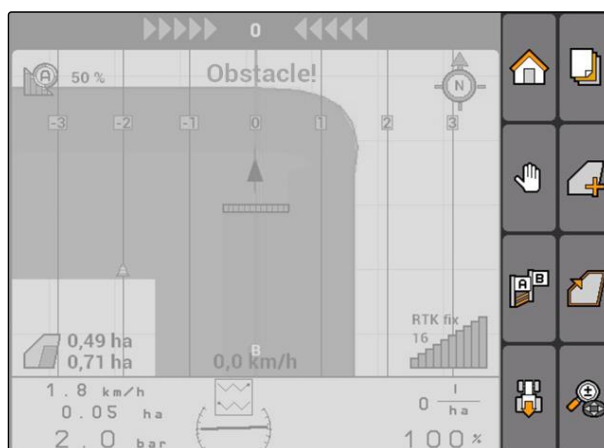
1. If the zoom is active:

Select .

➔ The symbol for map panning is shown: .

2. Pan the map using the directional pad.
3. To focus on the vehicle symbol and zoom the map back to the standard dimensions,

Press .





11.6

Turning around the orientation of the tractor symbol

CMS-T-006326-A.1


If the orientation of the tractor symbol on the map does not correspond to the direction of travel of the tractor, the vehicle symbol can be turned around manually. The driving direction is determined through the tractor or the GPS signal, see page 80. The symbol is only shown when the signal is evaluated by the GPS. If a signal is available from the tractor, the symbol will not be shown.


1. When the tractor is driving in reverse, but the tractor symbol is oriented to the front:
Select .
2. If the tractor is driving forwards, but the tractor symbol is oriented to the rear:
Select .

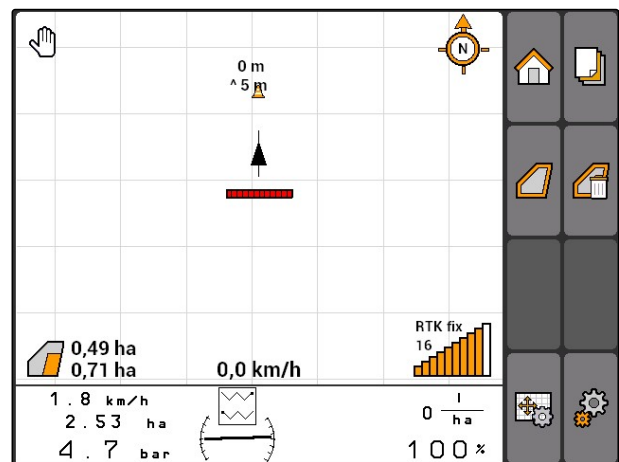
11.7

Marking obstacles

CMS-T-001600-A.1

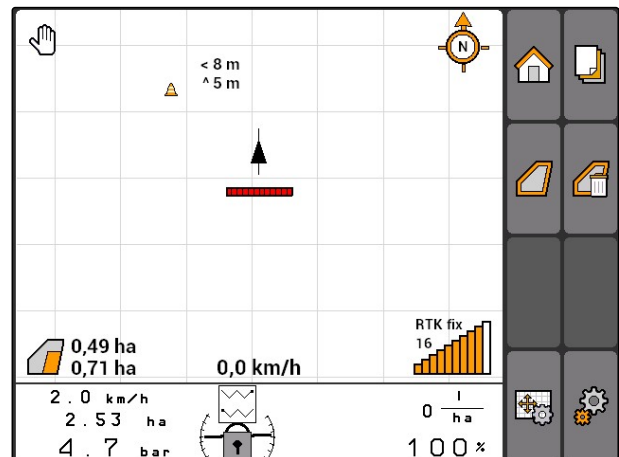
1. "GPS switch" > .

- ➔ The obstacle symbol  is flashing on the map.
- ➔ The length specification of the shift is shown beside the obstacle symbol.



2. Using the directional pad, shift the obstacle symbol to the desired position.

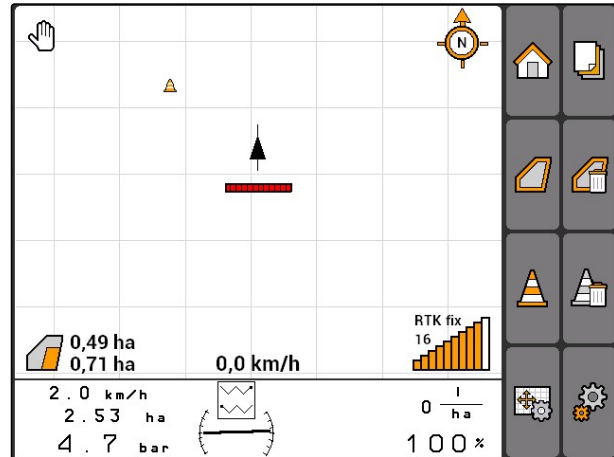
- ➔ The obstacle symbol is moved by one metre each time the button on the directional pad is pressed.



3. When the obstacle symbol has been shifted to the desired position,

press .

- ➔ The obstacle is positioned. The length specifications for the shift are faded out.




11.8

Deleting an obstacle marking

CMS-T-001605-A.1

All obstacle markings within a radius of 30 m will be deleted.

1. Position the vehicle at a distance of max. 30 m from the marked obstacle.
2. "GPS switch" > .
3. Confirm deleting.

11.9


Creating the field boundary

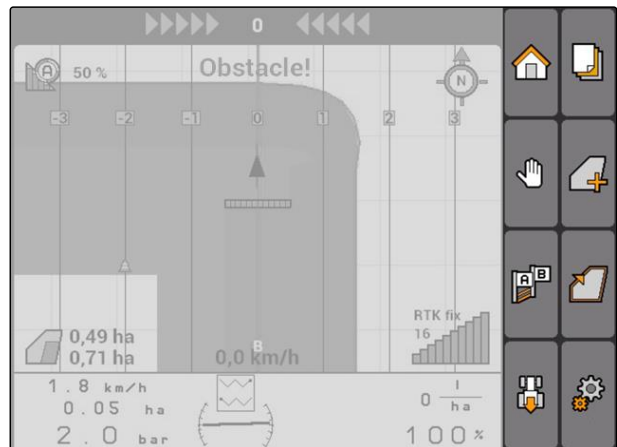
CMS-T-001595-B.1

The AMATRON 3 can create a field boundary from the worked area. Using the field boundary, the AMATRON 3 can calculate the size of the field. The worked area and the remaining area result from the field size.

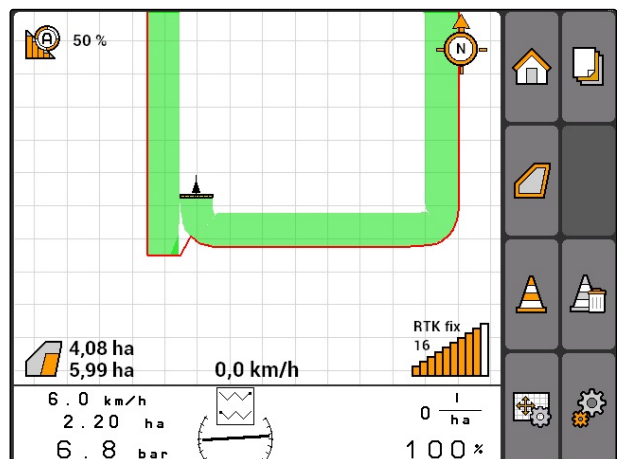
✓ REQUIREMENTS

- ✓ Completely work the field edge

► "GPS switch" > .




➔ The field boundary is laid around the worked area.



11.10

Deleting the field boundary

CMS-T-004872-A.1

1. "GPS switch" > .

2. Confirm deleting.



11.11

Managing virtual headlands

CMS-T-00004687-A.1

11.11.1 Creating virtual headlands

CMS-T-003520-B.1



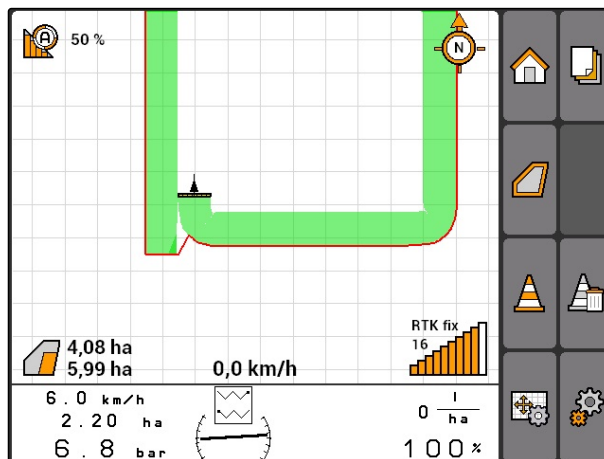
REQUIREMENTS

- ✓ Field boundary has been created, see page 98

1. "GPS switch" > .

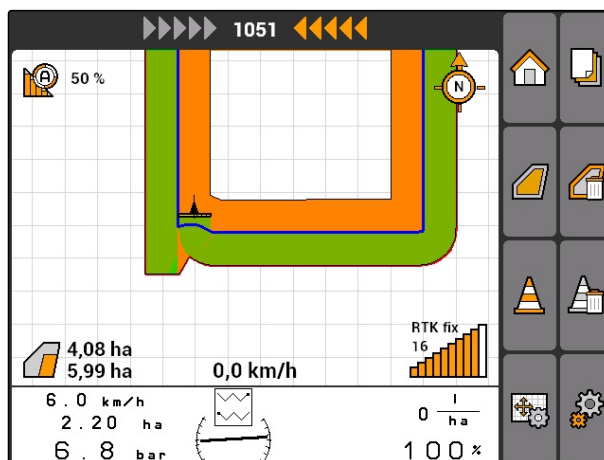
2. Enter and confirm the headland width.

➔ A query regarding the headland track line will be shown.



NOTE

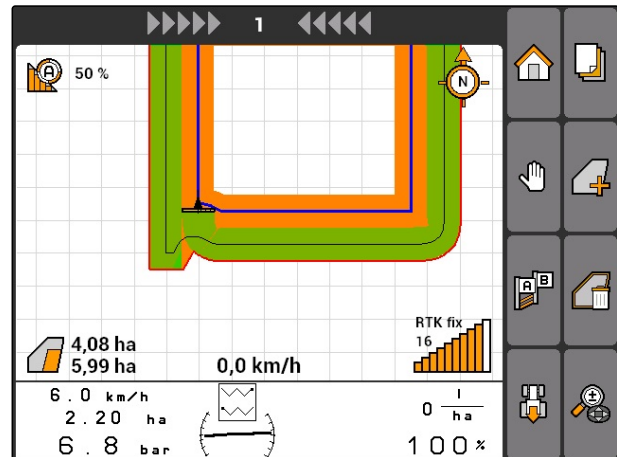
When the first track line is laid on the field boundary, the second headland track line lies one working width away from the field boundary inside the field.





NOTE

When the first headland track line is not laid on the field boundary, the first headland track line lies half of the working width away from the field boundary inside the field.



3. *If the first headland track line should be laid on the field boundary,*
Select "Yes"

or

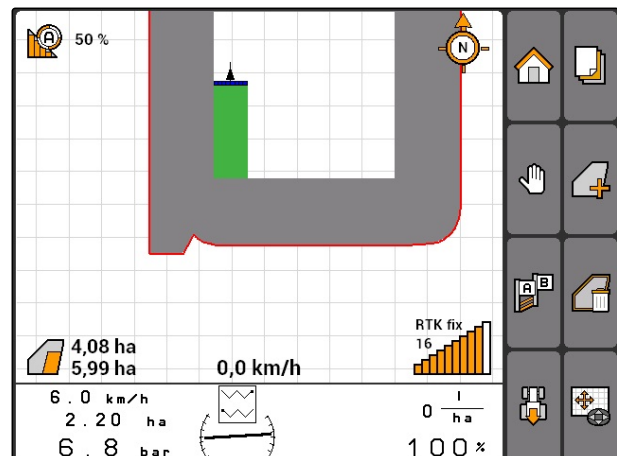
If the first headland track line should not be laid on the field boundary,
Select "No".

- ➔ After the headlands have been created, the headlands are shown as a grey area inside the field boundary.



NOTE

To be able to start the application/spreading within the headlands and use the track lines inside the headlands, the headlands must be unlocked, see page 101.




11.11.1.1 Locking or unlocking the headlands

CMS-T-003550-A.1

The headlands can be locked or unlocked for application/spreading. A GPS track license is not required for this function.

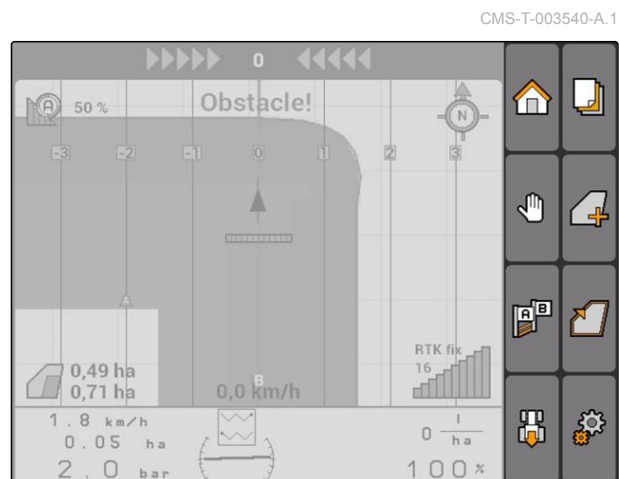
- Headlands locked: The headlands are shown in grey. In automatic mode, the part-width sections are switched off when the part-width sections protrude into the headlands.
- Headlands unlocked: The headlands are shown in orange. In automatic mode, the part-width sections are switched on when the part-width sections protrude into the headlands. Track lines are created inside the headlands.

11.11.1.2 Deleting the headland

1. "GPS switch" > .

2. Confirm deleting.

➔ The headland has been deleted.



11.11.2 Locking or unlocking the headlands

CMS-T-003550-B.1


The headlands can be locked or unlocked for application/spreading. A GPS track license is not required for this function.

- Headlands locked: The headlands are shown in grey. In automatic mode, the part-width sections are switched off when the part-width sections protrude into the headlands.
- Headlands unlocked: The headlands are shown in orange. In automatic mode, the part-width sections are switched on when the part-width sections protrude into the headlands. Track lines are created inside the headlands.



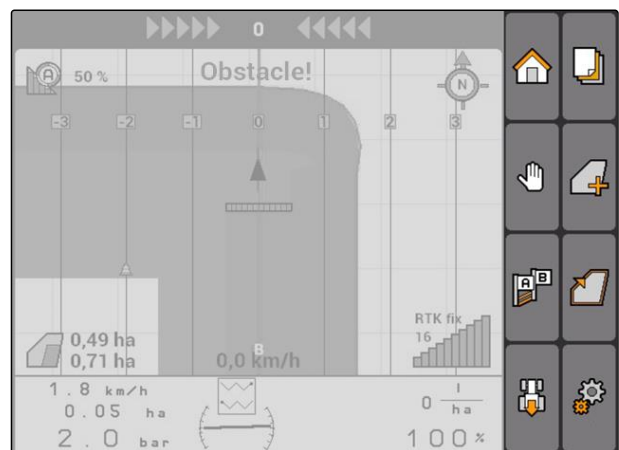
11.11.3 Deleting the headland

CMS-T-003540-A.1

1. "GPS switch" > .

2. Confirm deleting.

➔ The headland has been deleted.



CMS-I-001542

11.12

Using track lines

CMS-T-00004688-A.1

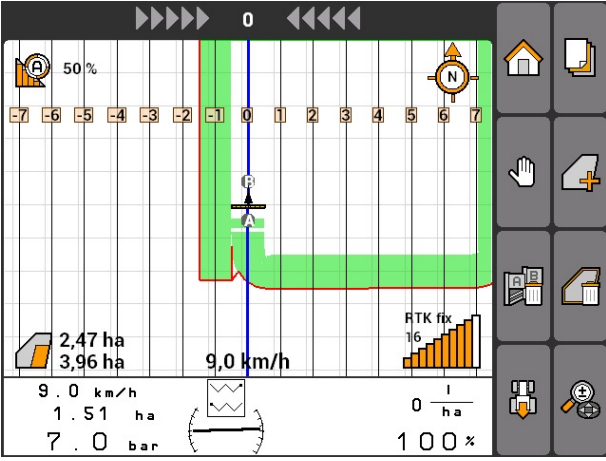
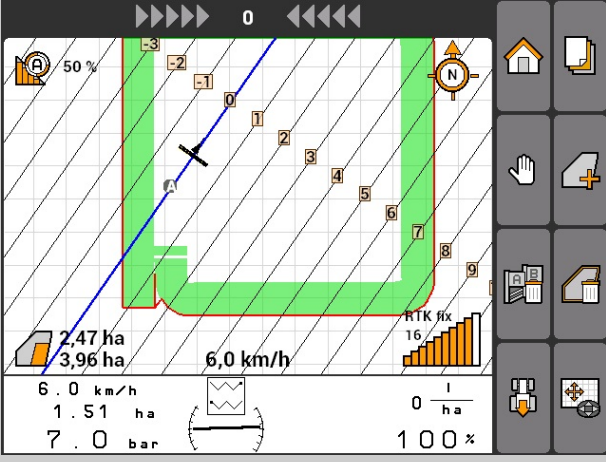
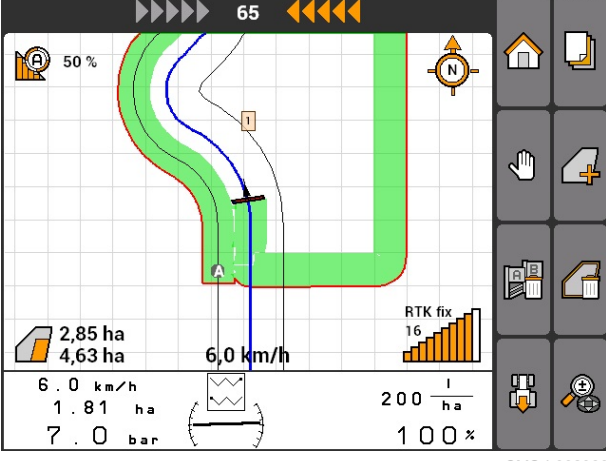
11.12.1 Selecting the track line pattern

CMS-T-003450-B.1

Track lines support the driver in working the field seamlessly. Depending on the requirements, different track line patterns can be used. If the field should be worked on beds, the track lines can be highlighted at specific intervals.


To allow the driver to follow the track lines more easily, the light bar is shown above the map on the AMATRON 3. The light bar shows the length of the track deviation. The light bar can be configured in the GPS switch settings.

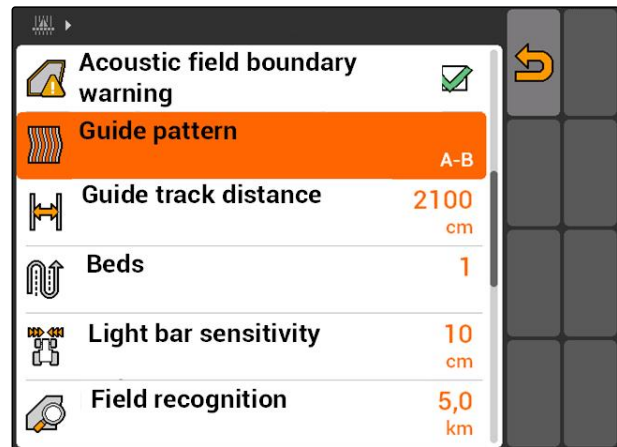
With the AMATRON 3, different types of track lines can be recorded. The track line pattern can be changed in the GPS switch settings.

Available track line patterns	Explanation	Figure
A-B	Straight track line that is laid between two points.	 <p>CMS-I-001478</p>
A+	Straight track line that is laid at a given angle. The specified angle of the track line is relative to the north-south axis.	 <p>CMS-I-001555</p>
Contour	Irregular track line that is recorded while driving between two point. The contours will be automatically smoothed.	 <p>CMS-I-002066</p>

✓ REQUIREMENTS

- ✓ GPS track is activated, see page 37

1. Select "GPS switch" >  > "Track line pattern".
2. Select the desired track line pattern and confirm.



CMS-I-001987


11.12.2 Defining the track line spacing

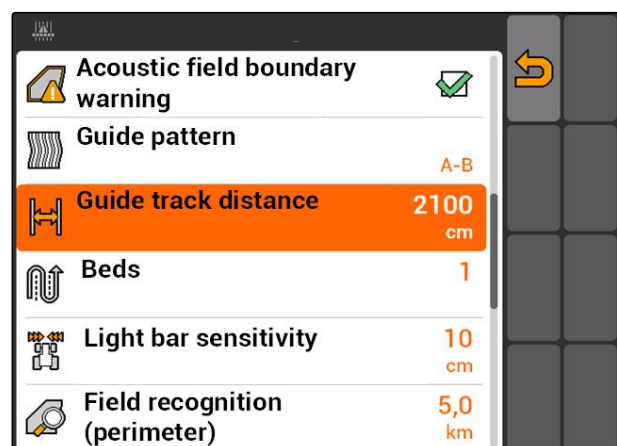
CMS-T-003465-A.1

The track line spacing is automatically defined as one working width. If the tracks are precisely followed, complete coverage is ensured. If overlapping of the rows is desired, the track line spacing can be changed manually.

i NOTE

If the track line spacing is reduced for desired overlap, the overlap tolerance must be adapted accordingly, see page 114.

1. Select "GPS switch" >  > "Track line spacing".
2. Enter the distance for the desired track line spacing and confirm.




CMS-I-001991

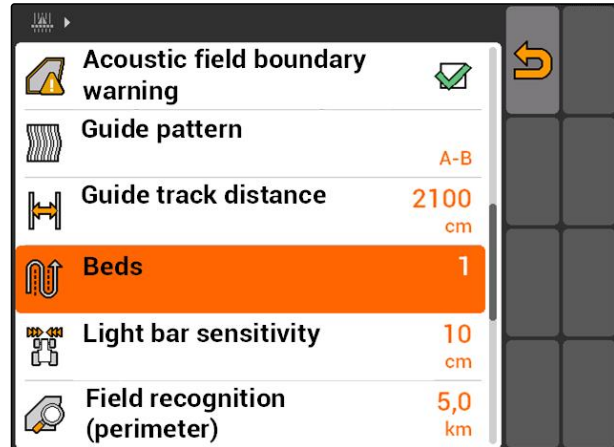
11.12.3 Creating beds

CMS-T-003470-A.1

To create beds, certain track lines can be highlighted. The highlighted track lines show the row in which the

worked area must be travelled to create a bed of the desired size. The entered number indicates the rhythm in which the track lines must be followed. If e.g. a 2 is entered, every second track line must be followed. In this way, one track line is always left out and therefore creates beds of one working width.

1. Select "GPS switch" >  > "Beds".
2. Enter the desired rhythm and confirm

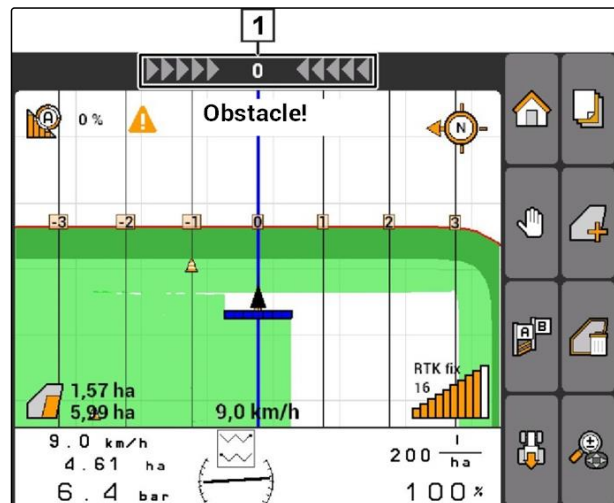


CMS-I-001995


11.12.4 Defining the light bar sensitivity

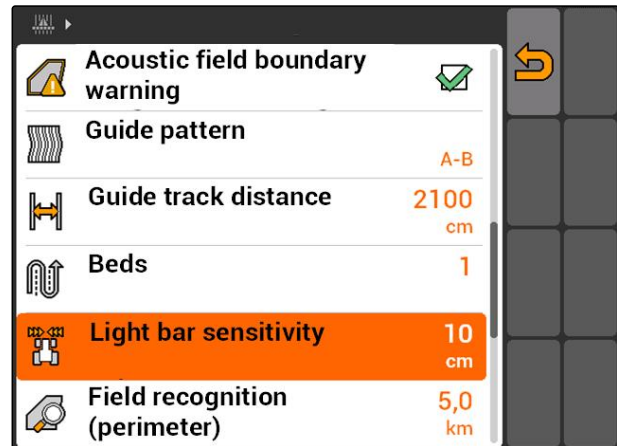
CMS-T-003420-A.1

When the vehicle deviates from the followed track line, the distance of the track line deviation is shown by arrow symbols that turn yellow consecutively 1. The light bar sensitivity indicates the distance by which the vehicle can deviate from the track line before another symbol for indicating the track line deviation turns yellow.



CMS-I-001999

1. Select "GPS switch" >  > "Light bar sensitivity".
2. Enter the length of the required track line deviation and confirm.



CMS-I-002086

11.12.5 Creating track lines

CMS-T-00004689-A.1

11.12.5.1 Creating an A-B line

CMS-T-005582-A.1

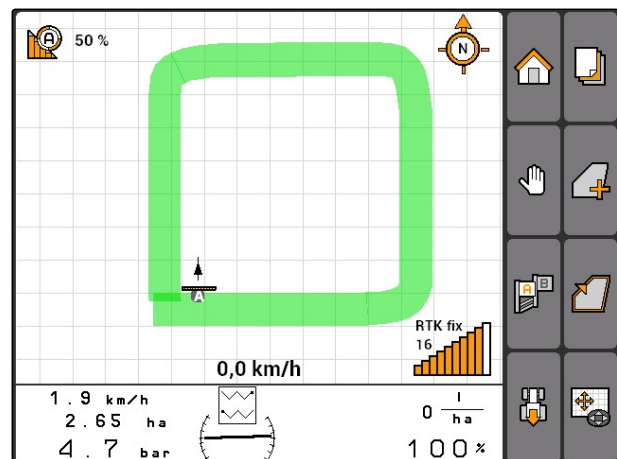
REQUIREMENTS

- ✓ "A-B" track line pattern is selected, see page 103
- ✓ The end point of the track line must be at least 15 m away from the start point.

1. Drive to the beginning of the row.


2. select .

➔ The start point of the track line is set on the vehicle position.

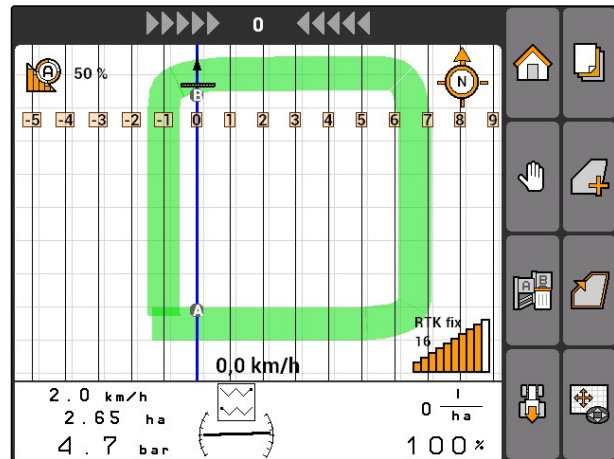


CMS-I-002055

3. Drive to the end of the row.

4. select  .

➔ The end point of the track line is set on the vehicle position. Other track line are added.



CMS-I-002054

11.12.5.2 Creating contour lines

CMS-T-005572-A.1



REQUIREMENTS

- ✓ "Contour" track line pattern is selected, see page 103

1. Drive to the beginning of the row.

2. select  .


➔ The start point of the track line is set on the vehicle position.

3. Drive to the end of the row.



NOTE

The end point of the track line must be at least 15 m away from the start point.

4. select  .

➔ The end point of the track line is set on the vehicle position. Other track line are added.

11.12.5.3 Creating A+ lines


CMS-T-005577-A.1



REQUIREMENTS

- ✓ "A+" track line pattern is selected; see page 103

1. Drive to the beginning of the row.

2. select .

➔ The number area for entering the track line angle will be opened.



NOTE

The preset angle for the track line corresponds to the vehicle orientation relative to the north-south axis. If the preset angle is used, the track line are oriented in the direction of travel.

3. *If the track lines should not be oriented in the direction of travel,*
enter the desired angle for the track lines and confirm.

11.13

Using part-width section control

CMS-T-00004691-A.1

11.13.1 Using manual part-width section control

CMS-T-00004692-A.1

11.13.1.1 Activating manual part-width section control

CMS-T-006306-B.1

GPS switch can also be operated manually, in this case, the automatic part-width section control is disabled. The part-width sections must be switched on and off manually.



REQUIREMENTS

For AMABUS implements and manual implements:

- ✓ The AMABUS implement or manual implement is configured, see page 42

For ISOBUS implements:

- ✓ The ISOBUS implement is connected




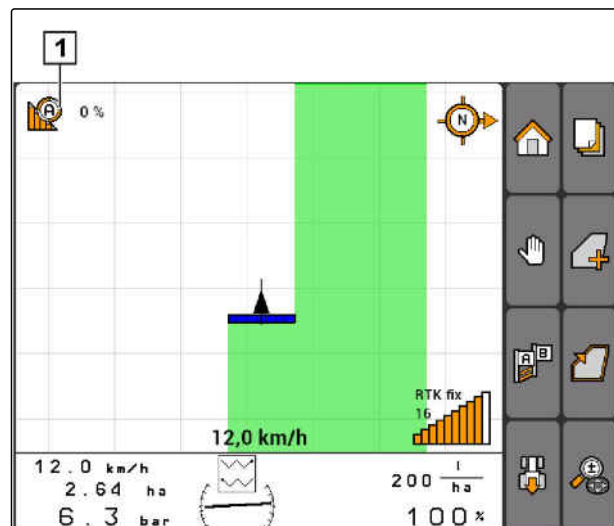
AMABUS and ISOBUS implements

CMS-T-005666-A.1

The recording of the worked areas starts when the part-width sections are manually switched on, and stops when the part-width sections are manually switched off.

The activated mode is shown on the map **1**.

- *If automatic mode is activated,*
select  in the GPS switch menu.
- ➔ Manual mode is enabled. The part-width sections must be switched manually.



CMS-I-002000



Manual implements

CMS-T-005671-A.1



NOTE

For manual implement, the recording must also be manually started and stopped.

1. *To start the recording,*
select  in the GPS switch menu
2. *To stop the recording,*
select  in the GPS switch menu.

11.13.2 Using automatic part-width section control

CMS-T-00004693-A.1

11.13.2.1 Activating automatic part-width section control

CMS-T-006234-B.1

GPS switch can be operated in manual mode and in automatic mode. In automatic mode, the automatic part-width section control is enabled.

When the part-width sections are driven over the following boundaries, the part-width sections are automatically switched on and off.

- Field boundary
- Boundary from the worked to unworked area
- Headland boundary

The recording of the worked areas starts when the part-width sections are switched on, and stops when the part-width sections are switched off.

✓ REQUIREMENTS

- ✓ The AMABUS implement or ISOBUS implement is connected
- ✓ The connected implement is configured for automatic part-width section control

The activated mode is shown on the map **1**.

► *When manual mode is enabled,*

select  in the GPS switch menu.

➔ Automatic mode is enabled. The part-width sections are automatically switched depending on the desired overlap.



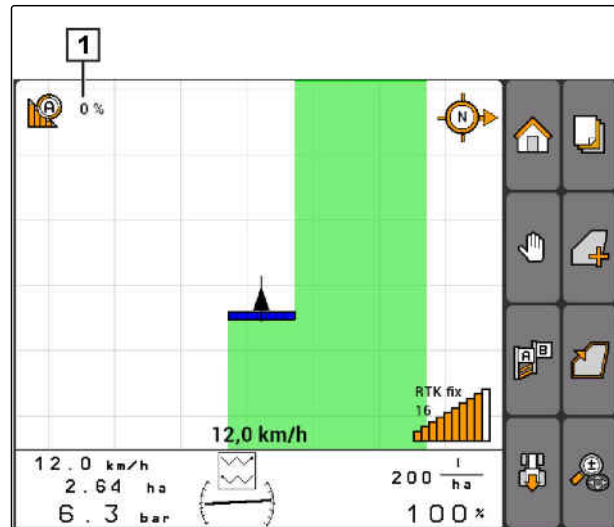
CMS-I-002000

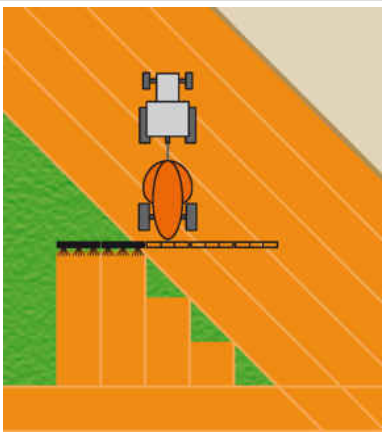
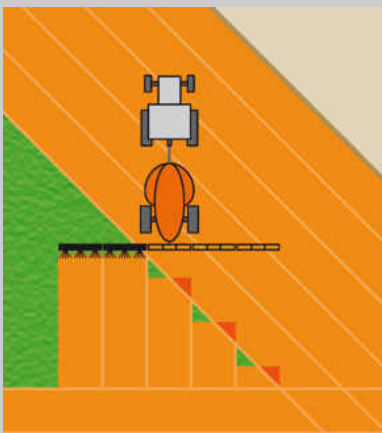
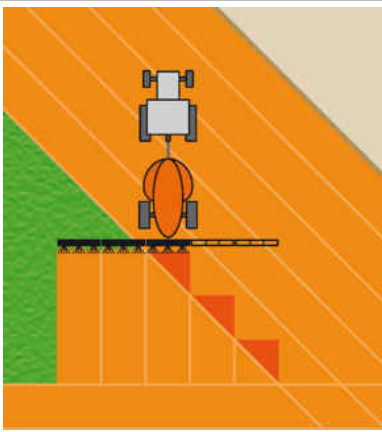
11.13.2.2 Defining the degree of overlap


The degree of overlap defines the percent by which a part-width section can protrude over a boundary before it is switched off. The set degree of overlap **1** is shown beside the symbol for automatic mode.

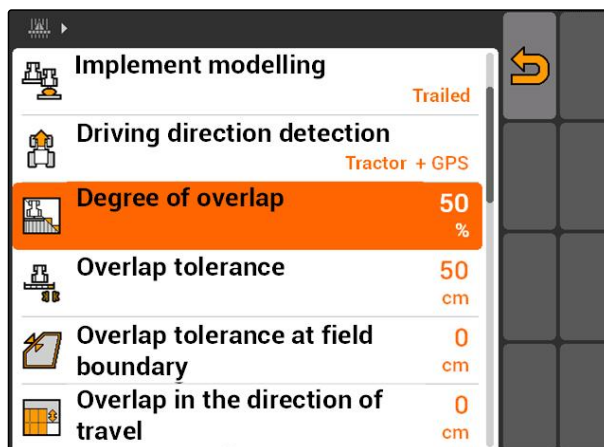
Boundaries for the degree of overlap:

- Boundary from unworked to worked area
- Headland boundary



Possible settings:	Explanation	Figure
0 %	The part-width sections are switched off before any overlap occurs.	 <p>CMS-I-002003</p>
50 %	The part-width sections are switched off when they half protrude over a boundary.	 <p>CMS-I-002002</p>
100 %	The part-width sections are switched when they fully protrude over a boundary.	 <p>CMS-I-002004</p>

1. Select "GPS switch" >  "Degree of overlap".
2. Select the percent value and confirm.



CMS-I-002265

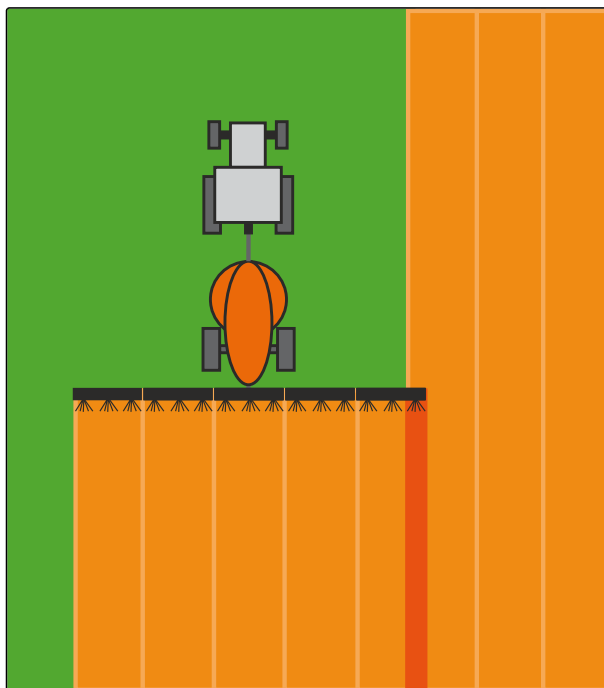
11.13.2.3 Defining the overlap tolerance

CMS-T-003410-A.1

The overlap tolerance defines how far the outer part-width sections can protrude over a worked area before they are switched off. Overlap tolerance prevents that the outer part-width sections are constantly switched on and off when they touch on boundaries during parallel driving.

Boundaries for the overlap tolerance:

- Boundary from unworked to worked area
- Headland boundary



CMS-I-000594

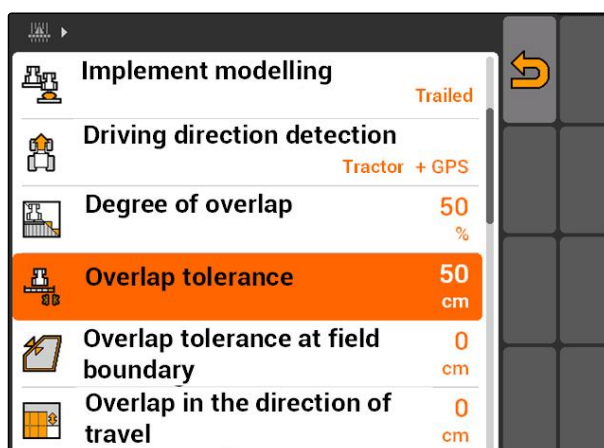
- Select "GPS switch" >  > "Overlap tolerance"

Possible settings:

- Half the working width or 0 cm to max. 150 cm.

NOTE

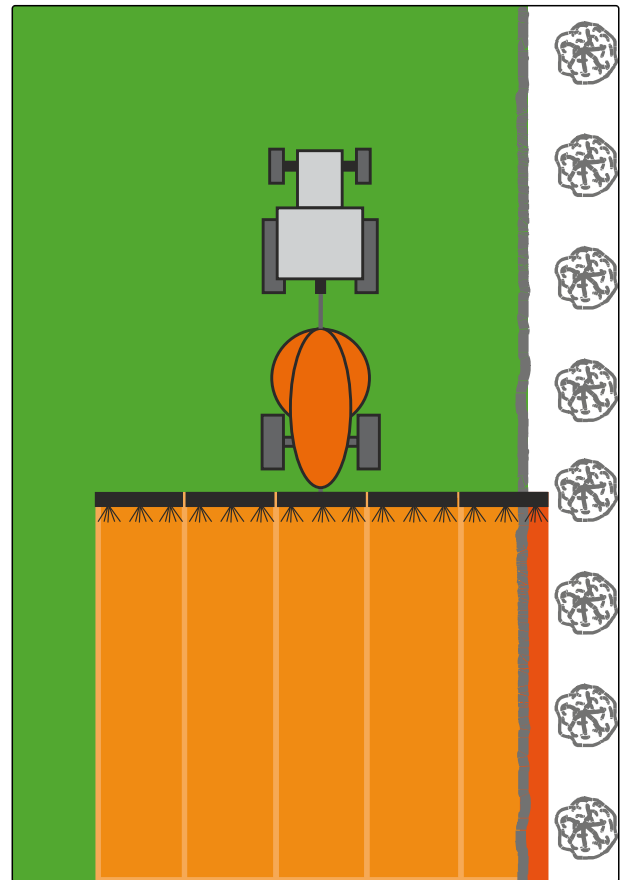
The overlap tolerance only applies when the degree of overlap is set to 0 % or 100 %, see page 112.



CMS-I-002269


11.13.2.4 Defining the overlap tolerance at the field boundary

The overlap tolerance at the field boundary defines how far the outer part-width sections can protrude over the field boundary before they are switched off. Overlap tolerance at the field boundary prevents the outer part-width sections from being constantly switched on and off when driving along and touching a field boundary. This is because a degree of overlap of 0 % is always set at the field boundary.



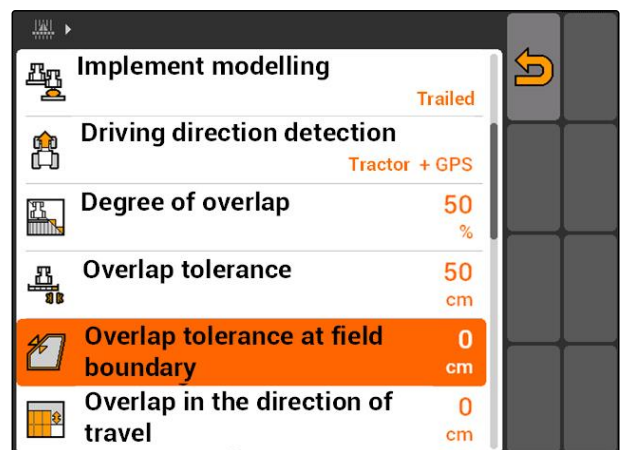
CMS-T-003440-A.1

CMS-I-001467

- Select "GPS switch" >  > "Overlap tolerance at field boundary".

Possible settings:

- Value between 0 cm and 25 cm



CMS-I-002273

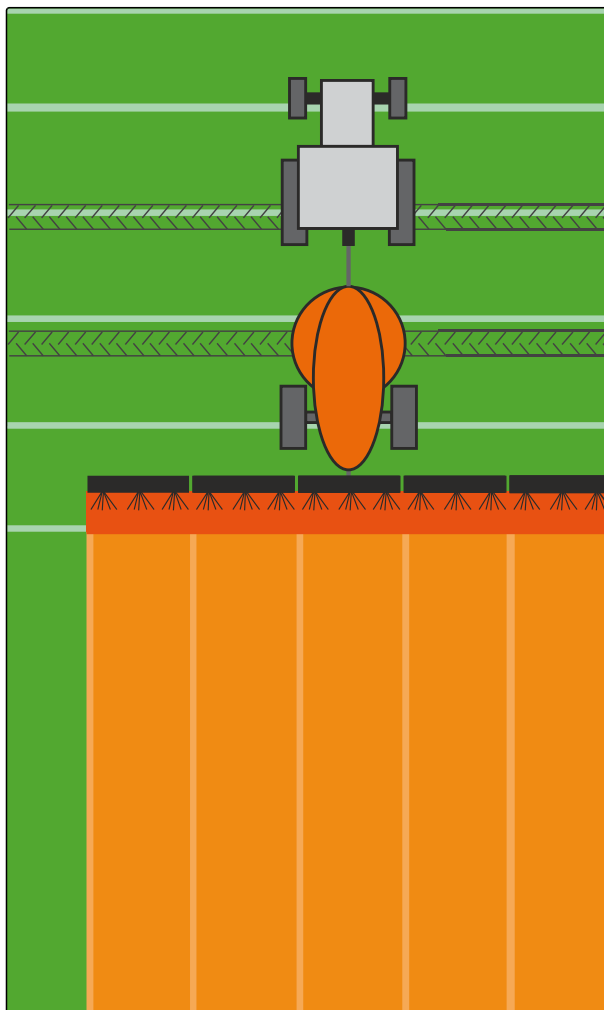
11.13.2.5 Defining the overlap in the direction of travel

CMS-T-003435-A.1


The overlap in the direction of travel indicates how far the part-width sections can protrude over a boundary in the direction of travel before they are switched off. Overlap in the direction of travel prevents gaps from occurring between the headlands and the rows or between the worked areas.

Boundaries for the overlap in the direction of travel:

- Boundary from unworked to worked area
- Headland boundary



CMS-I-001468

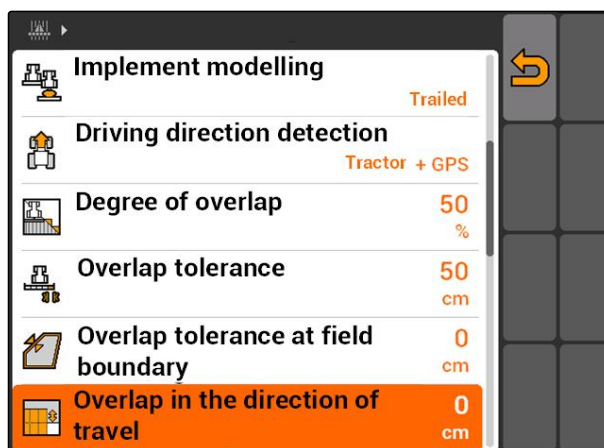
- Select "GPS switch" >  > "Overlap in the direction of travel"

Possible settings:

- Value between -1000 cm and 1000 cm

NOTE

If a gap is intended between the headlands and the rows or between the worked areas, a negative value can also be entered for the overlap in the direction of travel. This prevents, for example, the seed rows from overlapping.



CMS-I-002277

11.14

Managing field data

CMS-T-00004694-A.1

11.14.1 Saving recorded field data

CMS-T-003499-A.1

Field data that was created with the AMATRON 3 can be saved as a recording to a USB flash drive. Saved recordings can be loaded at a later time and used again.



The field data includes the following data:

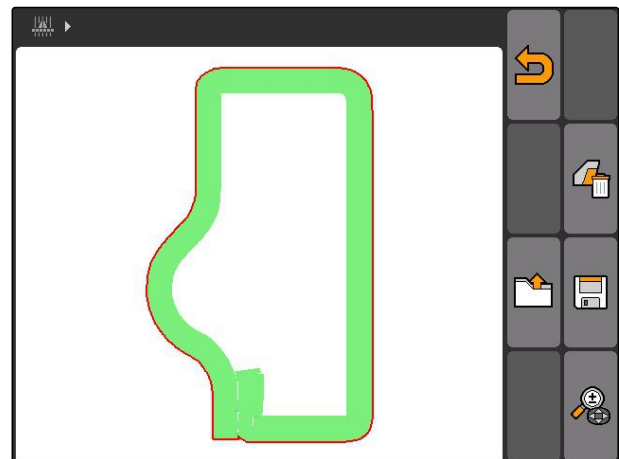
- Field boundary
- Worked area
- Track lines
- Obstacles
- Application maps
- Headlands



REQUIREMENTS

- ✓ USB flash drive is inserted

1. Select "GPS switch" > .
- ➔ The field data menu will be opened.
2. In the field data menu, select .
3. Enter name for the field data file and confirm.
- ➔ The field data will be saved to the USB flash drive.



11.14.2 Deleting recorded field data


CMS-T-003509-A.1

All recorded field data can be deleted. The field data can be previously saved to the USB flash drive.


The field data includes the following data:

- Field boundary
- Worked area
- Track lines
- Obstacles

- Application maps
- Headlands

1. "GPS switch" > .

➔ The field data menu will be opened.

2. In the field data menu, select .

3. *If the field data should be deleted without saving the field data to the USB flash drive, Select "No".*

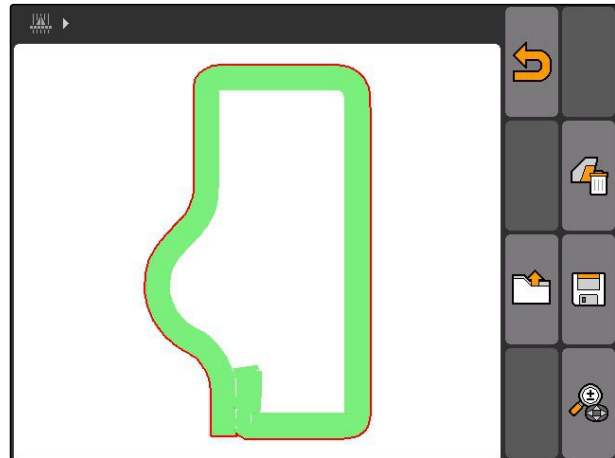
➔ The field data will be deleted from the current job.

4. *If the recorded field data should be saved to the USB flash drive before deleting the field data, Select "Yes".*

5. Enter the name for the field data and confirm.

➔ The field data will be saved to the USB flash drive.

➔ The field data will be deleted.



11.14.3 Loading field data from recordings

CMS-T-003515-B.1

Recordings are field data files that were created with an AMATRON 3 and saved.

The following field data can be loaded:


- Field boundaries
- Worked area
- Track lines
- Obstacles
- Application maps
- Headlands

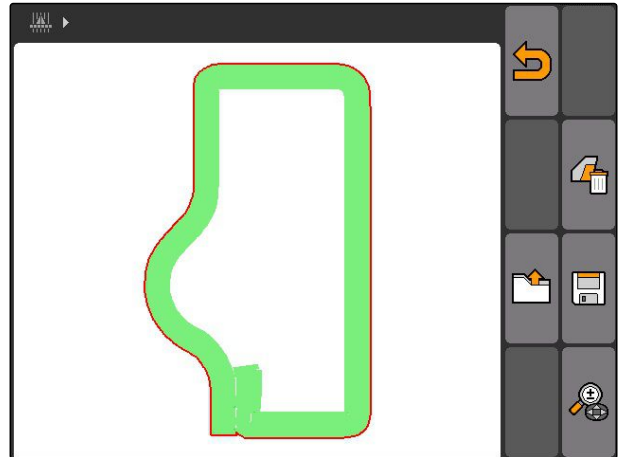
✓ REQUIREMENTS

- ✓ Recordings are available on the USB flash drive

1. Select "GPS switch" > .

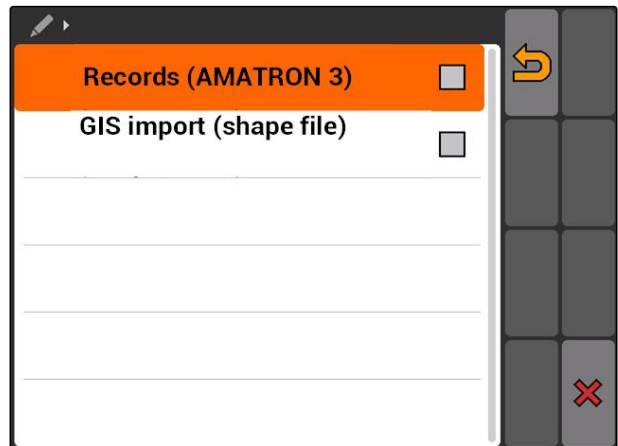
➔ The field data menu will be opened.

2. In the field data menu, select .



3. Select "Recording".

➔ The saved field data files will be displayed.



4. To delete a field data file:

Select  .

or

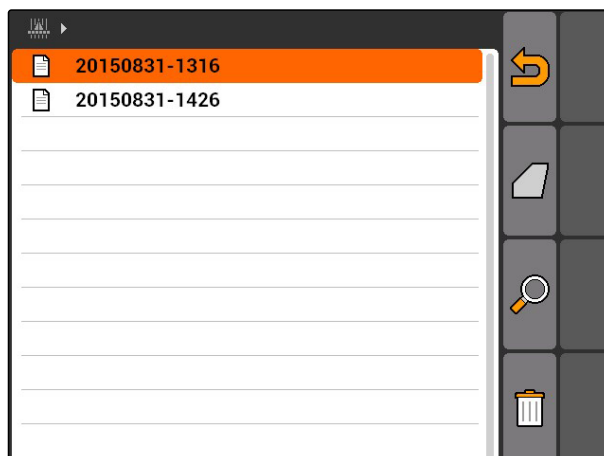
To search for field data files:

Select  .

or

To show all field data file for fields within a radius:

Select  .



NOTE

The radius for which the existing field data files are shown depends on the corresponding GPS switch setting, see page 120.

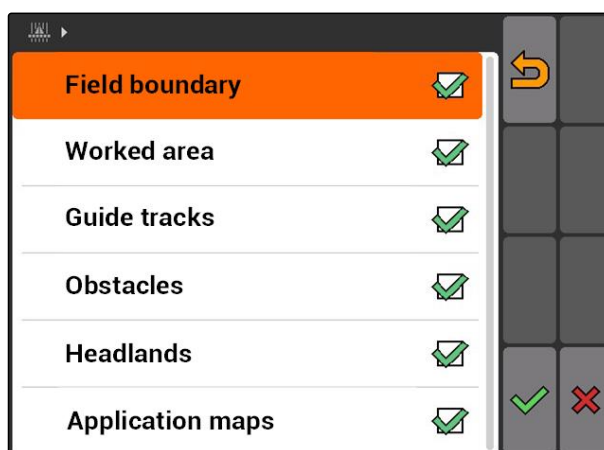
A GPS signal is required to display the field data file within a radius.

5. To load a field data file,

select the desired field data file.

6. Select which field data should be imported and confirm.


➔ The selected field data will be imported.

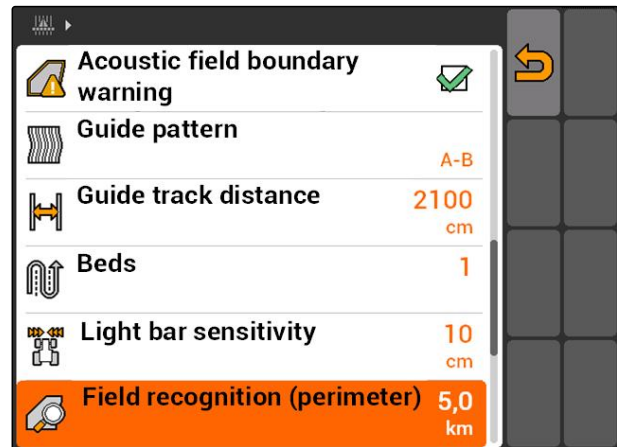


11.14.3.1 Defining the radius for field detection

CMS-T-003445-A.1

The field detection radius defines which field data files are shown when field data is imported. The field data files for all fields within the specified radius around the vehicle position will be shown.


1. Select "GPS switch" >  > "Detect fields (radius)".
2. Enter the radius for field detection and confirm.

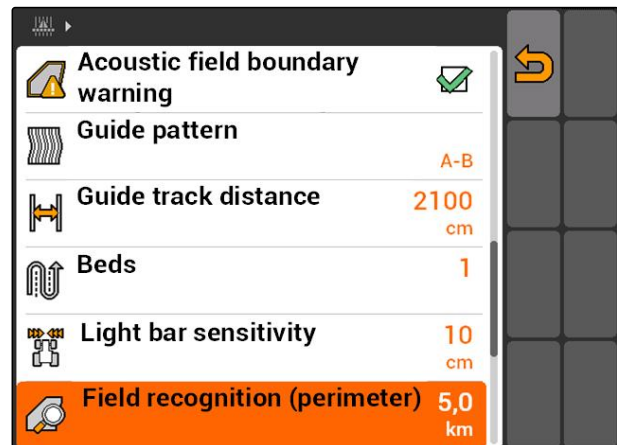


11.14.4 Defining the radius for field detection

CMS-T-003445-A.1

The field detection radius defines which field data files are shown when field data is imported. The field data files for all fields within the specified radius around the vehicle position will be shown.


1. Select "GPS switch" >  > "Detect fields (radius)".
2. Enter the radius for field detection and confirm.




CMS-I-002013

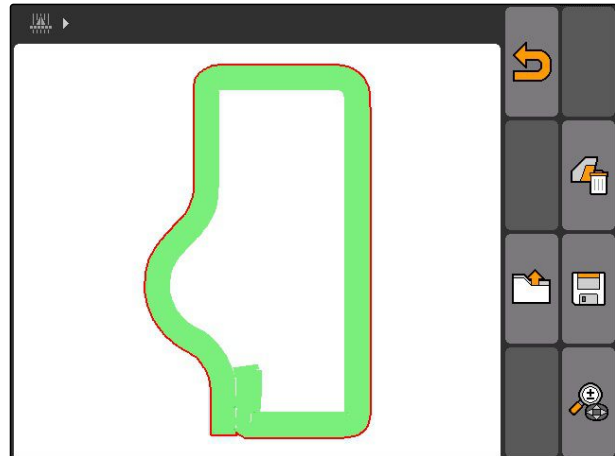
11.14.5 Loading field data from a shape file

CMS-T-003504-B.1

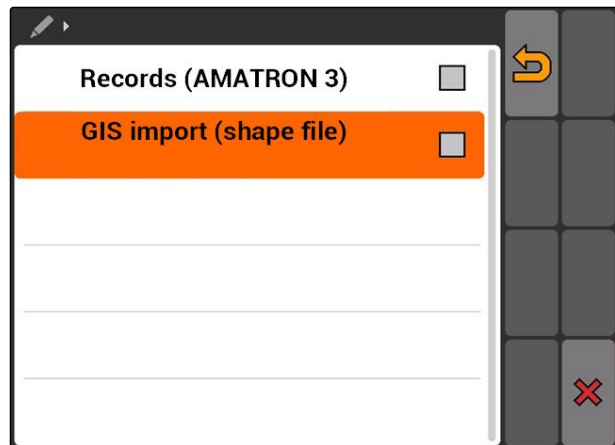
1. GPS switch > .

➔ The field data menu will be opened.

2. In the field data menu, select .

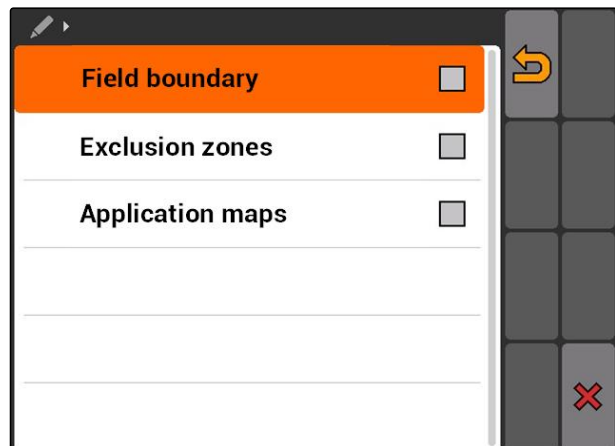


3. Select "GIS import".



4. Select which field data type should be imported.

➔ The content of the USB flash drive will be shown.

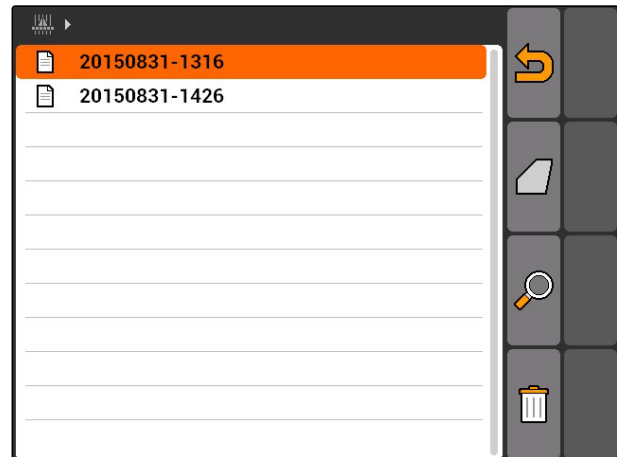


5. Select the shape file and confirm.

➔ The selected field data type will be imported.

NOTE


Imported application maps must be configured, see page 123.

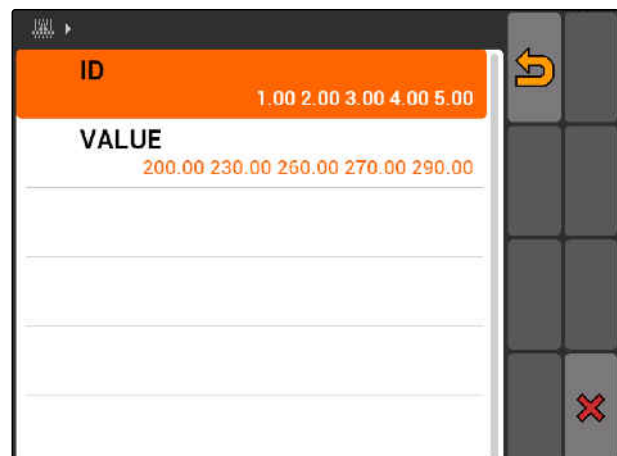


11.14.5.1 Configuring the application map

CMS-T-005142-A.1

If "Application maps" was selected when importing the field data, further settings must be entered.

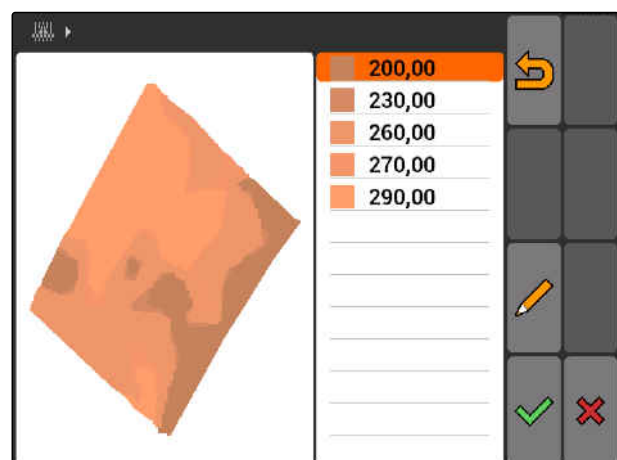
1. Select the values for the application/spread rate.
2. Select the units for the application/spread rate.
3. *If all of the values should be increased or reduced by a specific percent value,*
select  and enter the percent value.
4. *If a specific value should be changed,*
select the value from the list and enter the new value. Example: Application/spread rate should be increased by 10 %, enter 110 % and confirm.



➔ The application map will be imported.

NOTE


To be able to use the application map for an ISO-XML job, a job must be added to the application map as a setpoint.

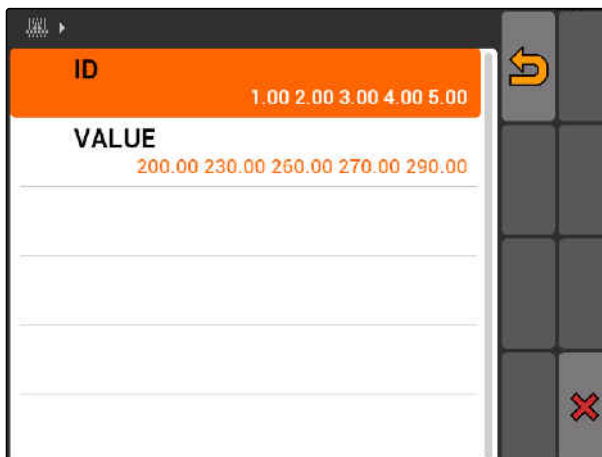


11.14.6 Configuring the application map

CMS-T-005142-A.1

If "Application maps" was selected when importing the field data, further settings must be entered.

1. Select the values for the application/spread rate.
2. Select the units for the application/spread rate.
3. *If all of the values should be increased or reduced by a specific percent value,*
select  and enter the percent value.
4. *If a specific value should be changed,*
select the value from the list and enter the new value. Example: Application/spread rate should be increased by 10 %, enter 110 % and confirm.

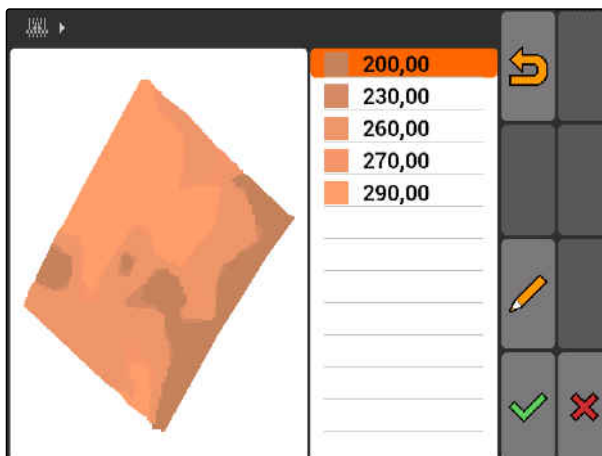


CMS-I-001549

➔ The application map will be imported.

NOTE

To be able to use the application map for an ISO-XML job, a job must be added to the application map as a setpoint.



CMS-I-001550

11.15

Using the driver assistance system

CMS-T-005190-A.1

Switching delays of the seed drill and uneven forward speeds can cause overlap or underlap in the seed rows. The driver assistance system supports the driver in working the field seamlessly. The driver assistance system notifies the driver with a signal tone and a symbol that the vehicle is approaching the switch point and that the forward speed must be kept constant.

The driver assistance system can be used on the following boundaries:

- Headland boundary
- Field boundary
- Boundary from the worked to unworked area

A commonly used switch point in practice is the headland boundary. In the following instructions, the driver assistance system will be explained using the example of entering the headlands.



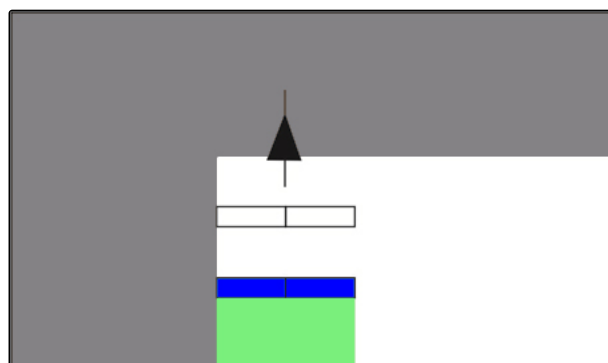
REQUIREMENTS

- ✓ Driver assistance system is configured, see page 85
- ✓ GPS switch is in automatic mode, see page 111

1. Drive towards the headland.

➔ At the configured distance from the headland, an additional symbol for the switch point of the implement will be shown.

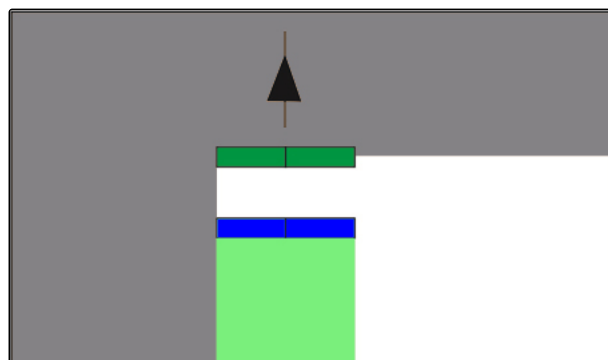
➔ The AMATRON 3 issues two short, low tones.



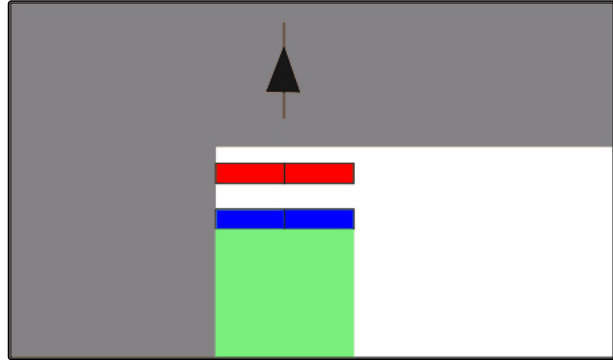
2. Maintain constant speed.

➔ When the additional symbol has reached the headland boundary, the part-width sections are switched off. The additional symbol turns green and stops on the headland boundary.

➔ When constant speed is maintained until the application/spreading stops, the additional symbol remains green. There is no overlap or underlap.



- ➔ If the speed becomes irregular before the application/spreading stops, the additional symbol turns red and moves. The AMATRON 3 issues a long, high signal tone. There is overlap or underlap.



11.16

Calibrating the GPS switch

CMS-T-00004696-B.1

11.16.1 Correcting GPS switch

CMS-T-001610-C.1

The GPS switch can be calibrated to compensate for GPS drift. GPS drift is defined as the deviations of the GPS signal. GPS drift results from the use of correction sources with low precision. GPS drift can be recognised when the vehicle symbol on the AMATRON 3 no longer corresponds to the actual position of the vehicle.

GPS drift can be corrected in 2 ways:

- Correcting the GPS drift with a reference point
- Correcting the GPS drift manually

- Select "GPS switch" > .

- ➔ The "Calibration" menu will be opened. The existing reference points will be listed.



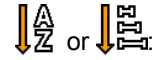
: Back to GPS switch



: Creates a reference point, see page 127



: Deletes the marked reference point



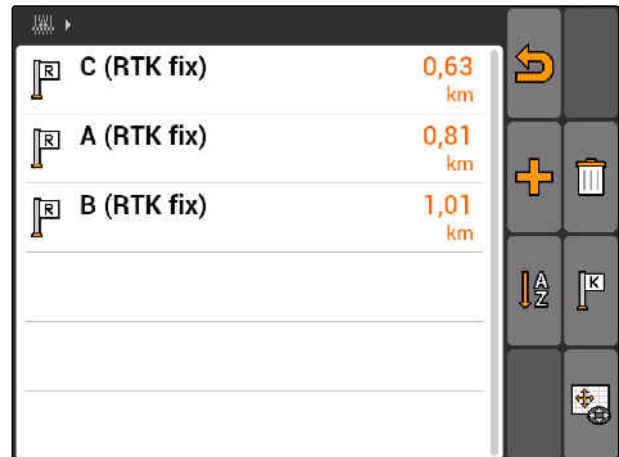
: Sorts the reference points alphabetically or according to the distance



: Starts the calibration for the marked reference point, see page 127



: Opens the manual position correction, see page 128



CMS-I-001551

11.16.2 Correcting the GPS drift with a reference point

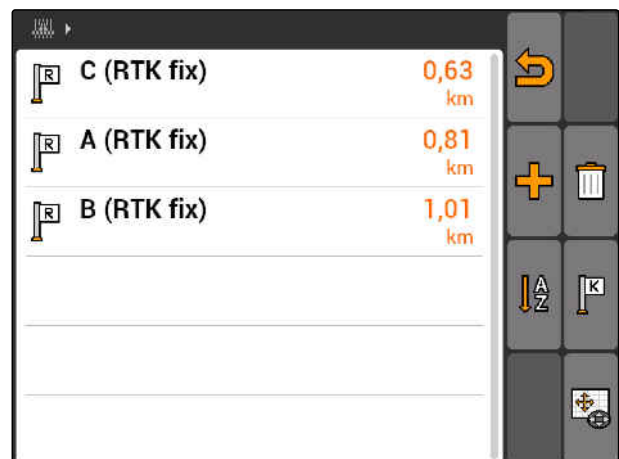
CMS-T-00004697-A.1

11.16.2.1 Creating a reference point

CMS-T-001622-B.1

The vehicle position can be checked based on a virtual reference point and then be corrected. To do so, a visible point on the field is required that serves as a real reference point, e.g. the entrance to the field or a tree. This point can be driven to at any time to compare the real vehicle position with the position of the virtual reference point on the AMATRON 3. In doing so, it is important to always drive to the reference point in the same way and from the same direction. If the positions do not match, the calibration for the corresponding reference point can be started.

1. Drive to a visible point with the vehicle.
 2. Create a new reference point.
 3. Enter the name for the reference point and confirm.
- ➔ The reference point will be set at the current vehicle position.



CMS-I-001551

11.16.2.2 Starting the calibration

CMS-T-003535-A.1

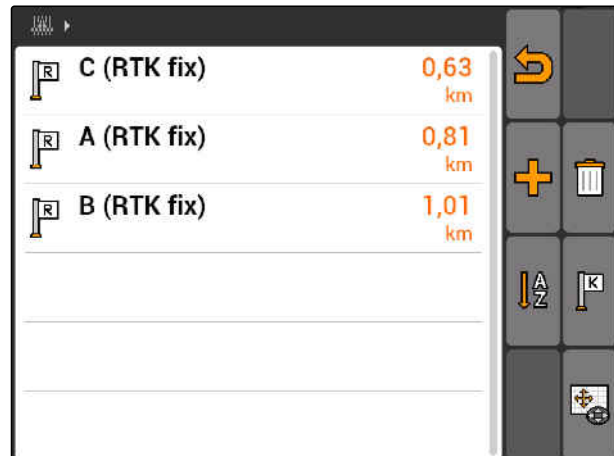
✓ REQUIREMENTS

- ✓ Reference point is set

1. Drive with the vehicle to the real reference point.
2. Mark the reference point in the list.

3. select .


➔ The calibration is started. The virtual reference point is moved to the vehicle position.



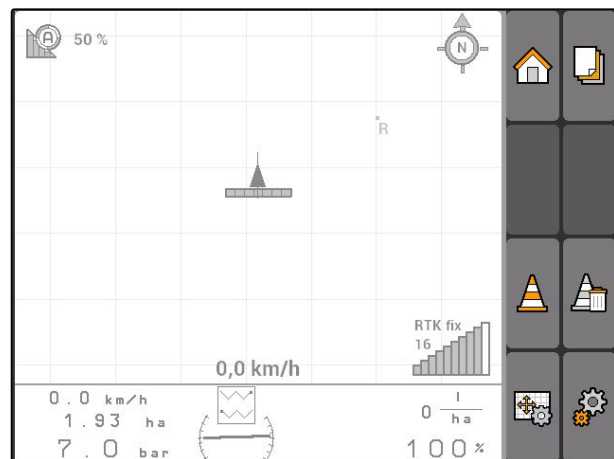
CMS-I-001551

11.16.3 Correcting the GPS drift manually


CMS-T-003530-B.1

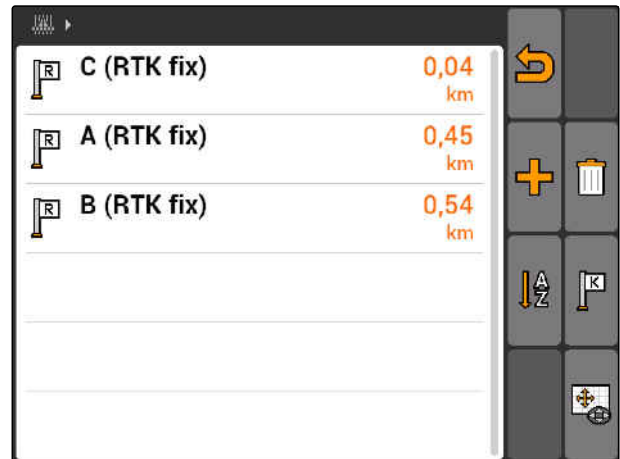
1. GPS switch > 

➔ The GPS switch calibration will be opened



CMS-I-002157

2. Start the manual calibration with .
- ➔ The GPS switch map will be shown.



CMS-I-001552

3. Move the vehicle symbol using the directional pad.
- ➔ The vehicle symbol will be shifted by the set increment.
- ➔ The length of the shift is shown by the corresponding arrow on the map.

4. To change the increment length:

select .

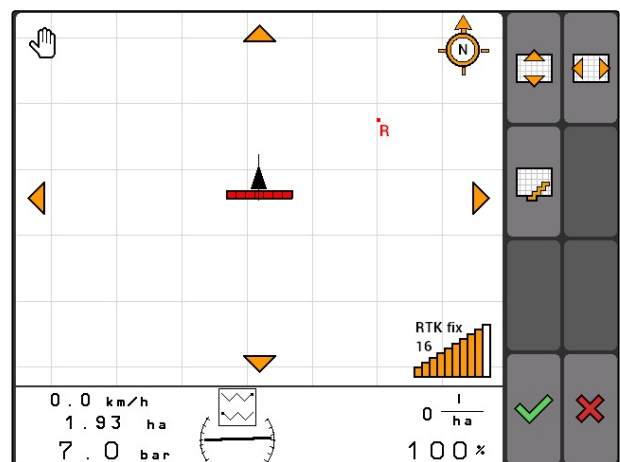
5. To shift the vehicle symbol up or down by a specific distance:

select .

6. To shift the vehicle symbol to the left or right by a specific distance:

select .

7. Confirm the settings.



CMS-I-001553

11.17

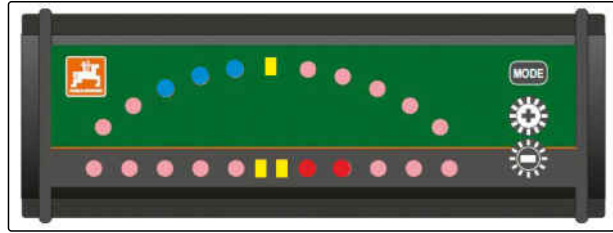
Using an external light bar

CMS-T-005180-B.1

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 steering angle required to return to the guide track. If only the yellow LEDs are lit, the implement is on the guide track.



CMS-I-001806

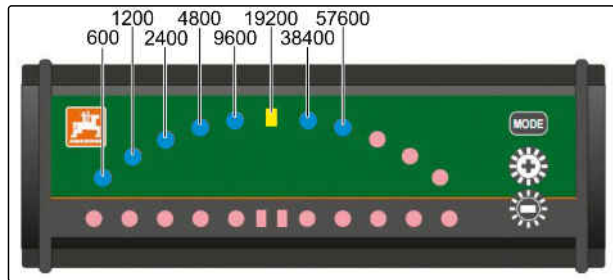
The light bar must have the same baud rate as the AMATRON 3 and the GPS receiver. The light bar is set to a baud rate of 19200 per default. The baud rate can be changed in the light bar configuration menu.

1. To change the baud rate of the light bar in the configuration menu,

press and hold  and switch on the AMATRON 3.

The upper LED strip shows the baud rate in the configuration menu: baud rates 600 to 57600 increasing from the left.

The lower LED strip shows the software version in the configuration menu. Software version: x.x, x = 1-5 lit LEDs).



CMS-I-001808

2. To increase or reduce the baud rate,

press  or .

3. Exit the configuration menu.

4. Restart the AMATRON.

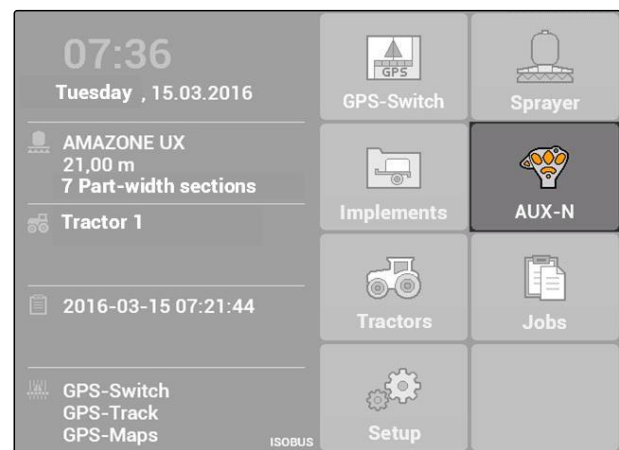
Using the AUX-N menu

12



CMS-T-003875-A.1

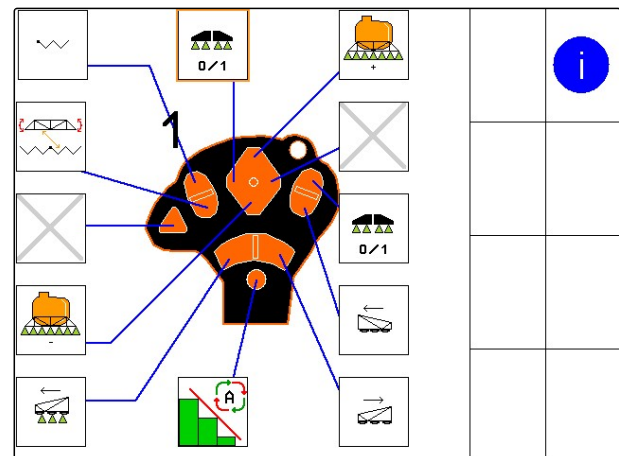
If an external input device is connected, the AUX-N menu can be used to access this input device. The functions within the menu depend on the connected external device. In this operating manual, the AUX-N menu is described based on the AmaPilot*.

1. Select AUX-N in the main menu.



The assignment is shown for each button on the AmaPilot*.

2. Switch among the assignments with the directional pad.
3. To call up details for an assignment, press .
- ➔ The selected assignment will be shown together with a symbol for the corresponding device.
4. To close the details for an assignment, Press .



Eliminating faults

13

CMS-T-00004703-A.1

Fault	Cause	Remedy
Formation of stripes between the tracks	Wrong tramlines	Correct the tramlines
		Calibrate the GPS drift reference point
GPS receiver has no reception		<ul style="list-style-type: none"> Call up the GPS diagnosis menu <p>Data available? No?</p> <ul style="list-style-type: none"> Check the connections of antenna / external GPS. Check if the light on the antenna is lit. Red: Power / Orange: GPS / Green: DGPS Check the external GPS device. Settings 19200 baud, 8 data bits, no parity, 1 stop bit <p>Data available? Yes?</p> <ul style="list-style-type: none"> For an external device, check the NMEA data sets: GGA, VTG, GSA, 5Hz Check GPS quality. Is the GPS signal too weak? See the list of signal requirements.
AMATRON 3 cannot be switched on	AMATRON 3 is switched on and off too rapidly	<ul style="list-style-type: none"> Wait for a few seconds and switch on again. Pull the 9-pin connector out of the basic equipment and plug it in again.
The GPS switch does not switch correctly, mainly too late.		<p>Are the GGA, VTG and GSA transmitted at 5 Hz?</p> <ul style="list-style-type: none"> Check the external GPS device.
The implement symbol does not move when driving, however, it is displayed and reacts to switching on and off (blue, red, grey)		<p>Are the GGA, VTG and GSA transmitted at 5 Hz?</p> <ul style="list-style-type: none"> Check the external GPS device.

Fault	Cause	Remedy
The GPS switch does not respond to the implement		<ul style="list-style-type: none"> Check whether the correct implement is set in the Task Controller <p>Check if the implement has the correct software</p> <ul style="list-style-type: none"> Spreader: as of version 2.31 Sprayer: as of version 7.06.01/02m Seed drill: as of version 6.04 / 2.22 <p>TECU from the tractor? No?</p> <ul style="list-style-type: none"> Setup > simulated TECU, enter the tractor and enable. Start a job
One or more part-width sections on the AMATRON 3 does/do not respond to the GPS switch or vice versa		<ul style="list-style-type: none"> Check whether the number of part-width sections in the GPS switch corresponds to that on the AMATRON 3
Individual part-width sections switch too early or too late		Check whether the size of the individual part-width sections in the GPS switch corresponds to those in the job computer.

Message	Cause	Remedy
Assignment of button and function is invalid. Select a different combination.	The selected function can not be triggered by the selected key.	Select another key for this function, or allocate another function to the key.
Assignments must always be done on the terminal with UT no. 1.	The AMATRON 3 is not UT no. 1 and is not responsible for the AUX-N assignment.	Make the assignment on another device or allocate the AMATRON 3 to UT no. 1, see page 24.
This ECU has not yet been initialised.	The device connected could not be loaded yet.	Wait, or restart the AMATRON 3.
One or more preferred assignments were in conflict and therefore deleted.	The functions of several connected devices have been configured to the same keys. Only the assignments of the first device will be allocated.	Check the AUX-N assignments, and if necessary, assign them again, see page 31
Error with the AUX-N assignment. The assignments will be deleted.		<p>Delete the pool for the corresponding device, see page 40.</p> <p>Restart the AMATRON 3.</p>

Message	Cause	Remedy
Manual assignments to this function are not permitted.	The allocation for this function is pre-defined by the device and it cannot be changed.	
Error when loading the pool.		Delete the pool for the corresponding device, see page 40. Restart the device.
Several Task Controllers have been detected with the same TC-ID. Check ISOBUS settings.	All the terminals connected must have different TC IDs.	Check the ISOBUS settings, see page 24
Several terminals with the same UT-ID have been detected. Check ISOBUS settings.	All the terminals connected must have different UT IDs.	Check the ISOBUS settings, see page 24
GPS receiver not initialised. GPS receiver is resetting.	Receiver not yet completely loaded.	Wait, or restart the GPS receiver if necessary.
Light bar active. The parameters cannot be read.		Deactivate the light bar in the settings, see page 29. Repeat the process.

Take screenshot

14

CMS-T-00000566-B.1

With a screenshot, an image is made of the displayed software interface and saved as an image file to the USB flash drive.



REQUIREMENTS

- ✓ USB flash drive is inserted

► Press and hold  and .

Indexes

15

15.1

GLOSSARY

CMS-T-003880-A.1

A

AEF certificate

The AEF certificate confirms that an ISOBUS component meets the ISOBUS standard set by AEF and has the corresponding functions. The ISOBUS component is therefore compatible with other certified ISOBUS components.

Application map

Application maps contain data that can be used to control an element of an implement. This data includes application rates or working depths.

Attribute

A shape file contains different values saved in columns of a table. These table columns are called attributes and can be individually selected. For example, different application rates for a product can be saved in a shape file.

ASD

Automatisierte Schlagbezogene Dokumentation (Automated Field-related Documentation). With the ASD interface, ASD-compatible data can be imported on the AMATRON 3. This includes e.g. data from sensors.

Alignment angle

Describes the position of the receiver during installation.

AUX

AUX stands for Auxiliary and refers to an additional input device, e.g. a multi-function stick.

B

Baud rate

Data transfer rate, measured in bits per second.

C

Correction source

Correction sources are the different systems used to improve and correct the GPS signal.

Control parameter

The control target refers to the controllable element of the implement. On a field sprayer, the spray pressure controller can be defined as a controllable element, which then regulates the application rate.

D

DGPS

Differential GPS: Differential global position determination system. A correction system increases the precision to +/-0.5 m (0.02 m with RTK).

E

ECU

ECU refers to the implement control that is installed in the implement. A control terminal can be used to access the implement controls and operate the implement.

EGNOS

European Geostationary Navigation Overlay Service. European system for satellite navigation correction.

F

Farm Management Information System

A Farm Management Information System, or FMIS, is a program for managing agricultural operations. Such programs can be used to manage jobs and master data.

Field boundary

Virtual line on the map of the AMATRON 3. The field boundary marks an area that can be worked. When a field boundary has been created, the AMATRON 3 can calculate the following values:

- Field size
- Worked area
- Remaining area

Firmware

A computer program that is permanently embedded in a device.

G

GPS

Global positioning system.

GLONASS

Russian global navigation satellite system

H

HDOP

Horizontal Dilution of Precision: Measurement for the precision of the horizontal position data (latitude and longitude) that is sent by the satellites.

M

MSAS

Multifunctional Satellite Augmentation. Japanese system for satellite navigation correction.

Master data

The master data includes the following data, amongst others:

- Data on the customer, farms and workers
- Data on the fields
- Data on the vehicles and implements
- Data on the track lines

R

RTK

Paid system for the correction of satellite data.

S

shape file

The shape file saves geometry information and attribute information in a data set. The geometry information forms shapes that can be used as boundary lines. The attribute information is required for the applications, e.g. to control the application rate. The shape file is in ".shp" format.

T

TASKDATA.XML

The TASKDATA.XML is a file that contains data on the jobs.

U

Universal Terminal (UT)

The Universal Terminal can be used to display the user interface of the ECU on the AMATRON 3.

15.2

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