RAUCH

Complementary instructions

Please read this manual carefully before using the machine!

Keep for future use

This operator's and assembly manual is an integral part of the machine. Suppliers of new and second-hand machines are required to document in writing that the operator's and assembly manual was delivered with the machine and handed over to the customer.

MDS ISOBUS

Version ≥ 6.17.00

5903853-C-en-0126

Original instructions

Dear customer,

By purchasing the machine control unit MDS ISOBUS for the MDS 8.2 mineral fertilizer spreader, you have shown confidence in our product. Thank you very much! We want to justify this confidence. You have purchased a powerful and reliable machine control unit.

However, in case unexpected problems arise, our customer service department is always there for you.

Please read this operator's manual as well as the operator's manual for the machine carefully before using the machine, and follow the advice given.

This manual may also describe equipment that is not included in your machine control unit.

Note the serial number of the machine control unit and of the machine

The machine control unit MDS ISOBUS has been calibrated at the factory for the fertilizer spreader with which it was supplied. It cannot be connected to another machine without new calibration.

Please enter the serial number of the machine control unit and of the machine here. When connecting the machine control unit to the machine, these numbers must be checked.

Serial number of electronic machine control unit:

Machine serial number:

Machine year of manufacture:

Technical improvements

We continuously strive to improve our products. For this reason, we reserve the right to make any improvements and changes to our machine that we consider necessary without notice. We do not accept any obligation to make such improvements or changes on machines that have already been sold.

We will be pleased to answer any other questions that you might have.

Yours sincerely

RAUCH Landmaschinenfabrik GmbH

Table of contents

1 User instructions

1.1 About this operator’s manual

This operator's manual is an **integral part** of the machine control unit.

The operator’s manual contains important instructions for **safe**, **proper**, and economic **use** and **maintenance** of the machine control unit. Compliance with its stipulations helps to **avoid risks**, reduce repair costs and downtime, and to increase the reliability and service life of the machine controlled with it.

The operator's manual must be kept in an easily accessible location close to where the control unit is operated (such as in the tractor).

The operator's manual does not replace your **own responsibility** as operator and operational staff of the machine control unit.

1.2 Meaning of warnings

The warnings in the operator’s manual are classified according to the severity of the risk and the probability of its occurrence.

The warning symbols draw attention to the residual risks to which users of the machine are exposed. The warnings used are structured as follows:

Symbol + **signal word**
Explanation

Level of danger of warnings
The level of danger is indicated in the signal word. The levels of danger are classified as follows:

⚠ DANGER!

Type and source of danger

This warning warns of a danger posing an immediate threat to the health and life of people.

Ignoring these warnings will result in severe injury or death.

- ▶ Always observe the measures described to prevent this danger.

⚠ WARNING!

Type and source of danger

This warning warns of a potentially dangerous situation for personal health.

Ignoring these warnings leads to severe injury.

- ▶ Always observe the measures described to prevent this danger.

⚠CAUTION!

Type and source of danger

This warning warns of a potentially dangerous situation for personal health.

Ignoring these warnings leads to injury.

▶ Always observe the measures described to prevent this danger.

NOTICE!

Type and source of danger

This warning warns of material and environmental damage.

Ignoring these warnings will result in damage to the machine and to the environment.

▶ Always observe the measures described to prevent this danger.

This is an instruction:
General instructions contain tips for the operation and information that is particularly useful, but no warnings about hazards.

1.3 Notes on text descriptions

1.3.1 Instructions and procedures

Steps that must be performed by operating staff are displayed as follows

▶ Instructions step 1

▶ Instructions step 2

1.3.2 Lists

Lists without a specific sequence are shown as lists with bullet points:

- Property A
- Property B

1.3.3 References

References to other sections in the document are shown with paragraph number, header text and/or page number:

- **Example:** Please also note *2 Layout and function*

References to other documents are shown as information or instructions without the exact chapter or page number:

- **Example:** Follow the instructions in the operator's manual of the universal drive shaft manufacturer.

1.3.4 Menu hierarchy, keys and navigation

Menus are the entries listed in the **main menu** window.

The menus list **submenus and/or menu items** where settings can be made (selection lists, text or number entries, starting a function).

The various menus and buttons of the machine control unit are illustrated **in bold letters**.

The hierarchy and the path to the requested menu item are marked with an > (arrow) between menu and/or menu item(s):

- System / Test > System / Test > Test/diagnosis means that you can reach the menu item Voltage via the menu item System / Test and the menu item Test/diagnosis.
    - The arrow > corresponds to the operation of the **scroll wheel** and/or the button at the screen (touchscreen).

2 Layout and function

This chapter is limited to the description of the functionality of the electronic machine controller; it does not specify any particular ISOBUS terminal.

- The instructions for the operation of the ISOBUS terminal can be found in the relevant operator's manual.

2.1 Overview of supported machines

Some models are not available in all countries.

- MDS 8.2 / 14.2 / 18.2 / 20.2 +W

Supported functions

- Spreading depending on forward speed
- RPM control: Spreading disc speed
- V8 section switching

2.2 Control elements

■ ***ISOBUS lite in conjunction with CCI-60***

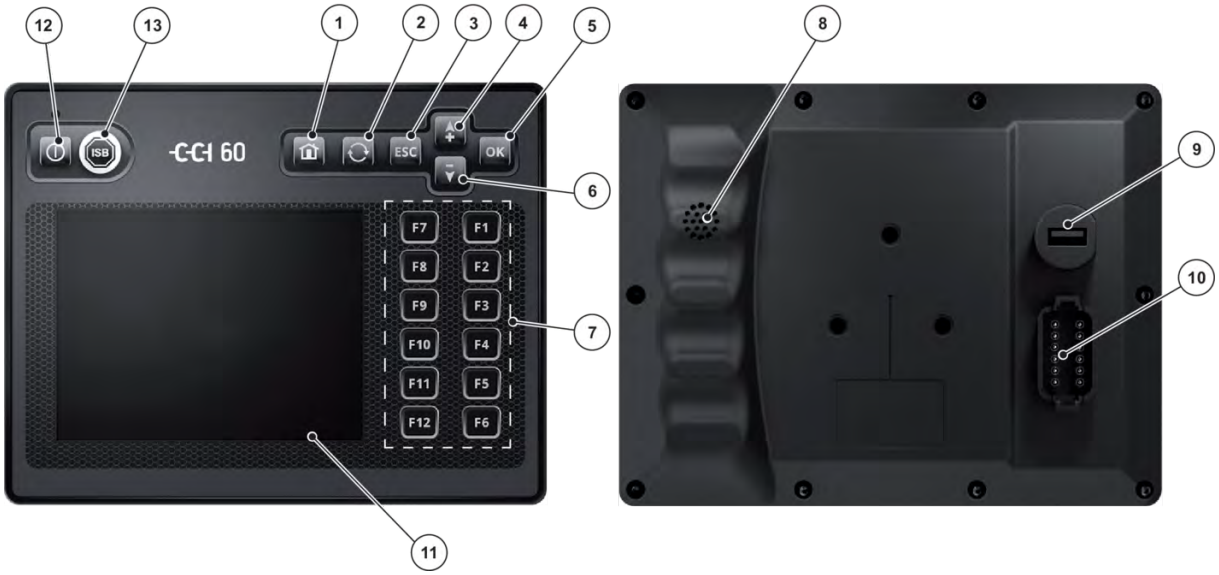


Fig. 1: Control elements

[1] Main menu key
[2] Switch over key
[3] ESC key
[4] Up arrow key
[5] OK key
[6] Down arrow key
[7] Function keys F1 to F12
[8] Buzzer
[9] USB port
[10] DT/A insertion plug
[11] Display screen
[12] ON / OFF key
[13] ISB key

1	Main menu key	Return to main menu
2	Switch over key	Switch over to the next machine
3	ESC key	The ESC key has the same function as the ESC or “back” buttons on the operating touch screen: • To abort an action after it had started. • To revert to the superior touch screen. • Changes are not saved, previous values are retained.
4	Up arrow key	The arrow keys allow navigation amongst the buttons on an operating touch screen. ▶ To navigate to the desired button. ▶ Press the OK button. Those buttons that are assigned to one of the F1-F12 function keys cannot be accessed using the arrow keys.

5	OK key	The OK key has the same function as the OK button on the operating touch screen: • Save a changed value. • Acknowledge a message.
6	Down arrow key	See 4 - Up arrow key
7	Function keys F1 to F12	There are 12 function keys (F1-F12) located to the right of the display screen. The keys can be used as an alternative to the buttons that are displayed at the right edge of the display screen.
8	Buzzer	The purpose of the sound level of the buzzer is: • To signal alarm states. • To give acoustic feedback.
9	USB port	The USB port is protected by a cap against ingress of moisture and dust.
10	DT/A insertion plug	12-pin plug connector
11	Display screen	• Touch-sensitive display (touch screen) • Size: 5.7” • Resolution: 640x480 pixels • High-contrast illumination suitable for daytime and nighttime use As an alternative to the touch screen, the operating and function keys allow full access to the terminal controls.
12	ON / OFF key	Switches the terminal on and off
13	ISB key	Sends an ISB command (if present)

2.3 Display

The display shows the current status information as well as the selection and input options for the electronic machine control unit.

The most important information concerning the operation of the machine is displayed in the **working screen**.

2.3.1 Description of the working screen

The exact representation of the working screen depends on the actual settings selected and on the machine type.
See *Chapter 2.1 - Overview of supported machines - Page 10* and *Chapter 2.3.2 - Display fields - Page 14*

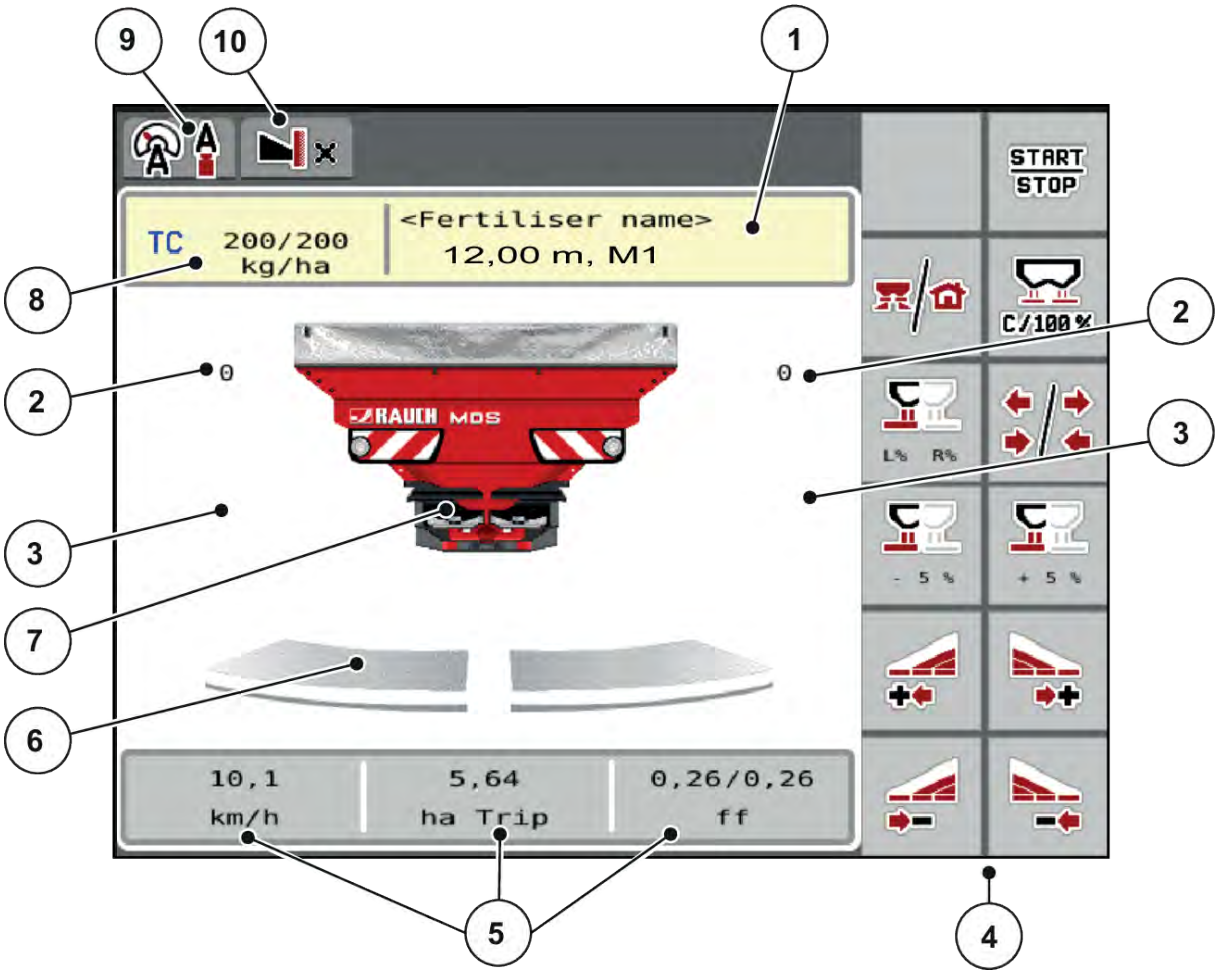


Fig. 2: MDS machine control unit display

[1] Fertilizer information display (fertilizer name, working width and spreading disc type)
Button: Adjustment in the fertilizer chart
[2] Metering slide position, right/left
[3] Quantity change, right/left
[4] Function keys
[5] Freely definable display fields
[6] Metering slide aperture status, right/left
[7] Mineral fertilizer spreader display
[8] Current application rate from the fertilizer settings or the task controller
Button: direct entry of the application rate
[9] Selected operating mode
[10] Display of edge/border settings

2.3.2 Display fields

The working screen includes three freely definable display fields. The following values can be assigned to the three display fields:

- Forward speed
- Flow factor (FF)
- ha trip
- kg trip
- m trip
- kg left
- m left
- ha left
- Idle time (Time until the next idle measurement)
- Torque (Spreading disc drive)
- Idling torque

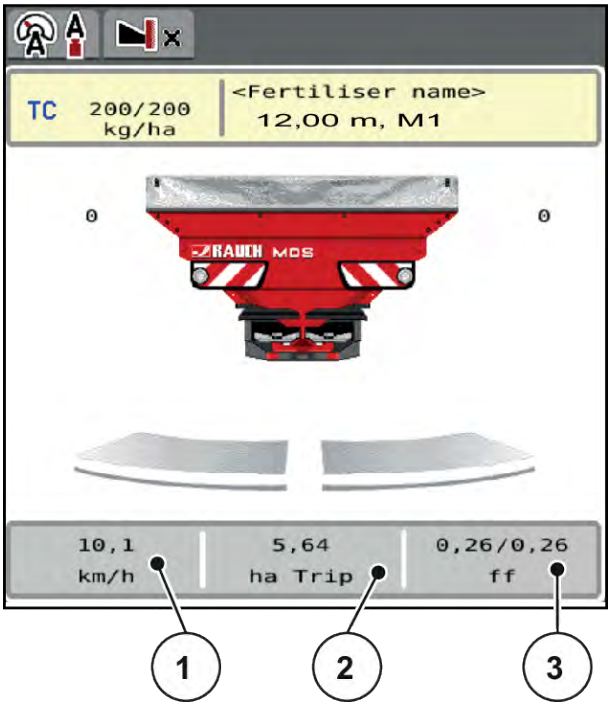


Fig. 3: Display fields

[1] Display field 1
[2] Display field 2
[3] Display field 3

Select display

▶ Press the corresponding display field in the touch screen.

The available options are displayed in a list.

▶ Select the new value to be assigned to the display field.

▶ Press the OK button.

The working screen is displayed.

The respective display field displays the new value.

2.3.3 Display of the metering slide status

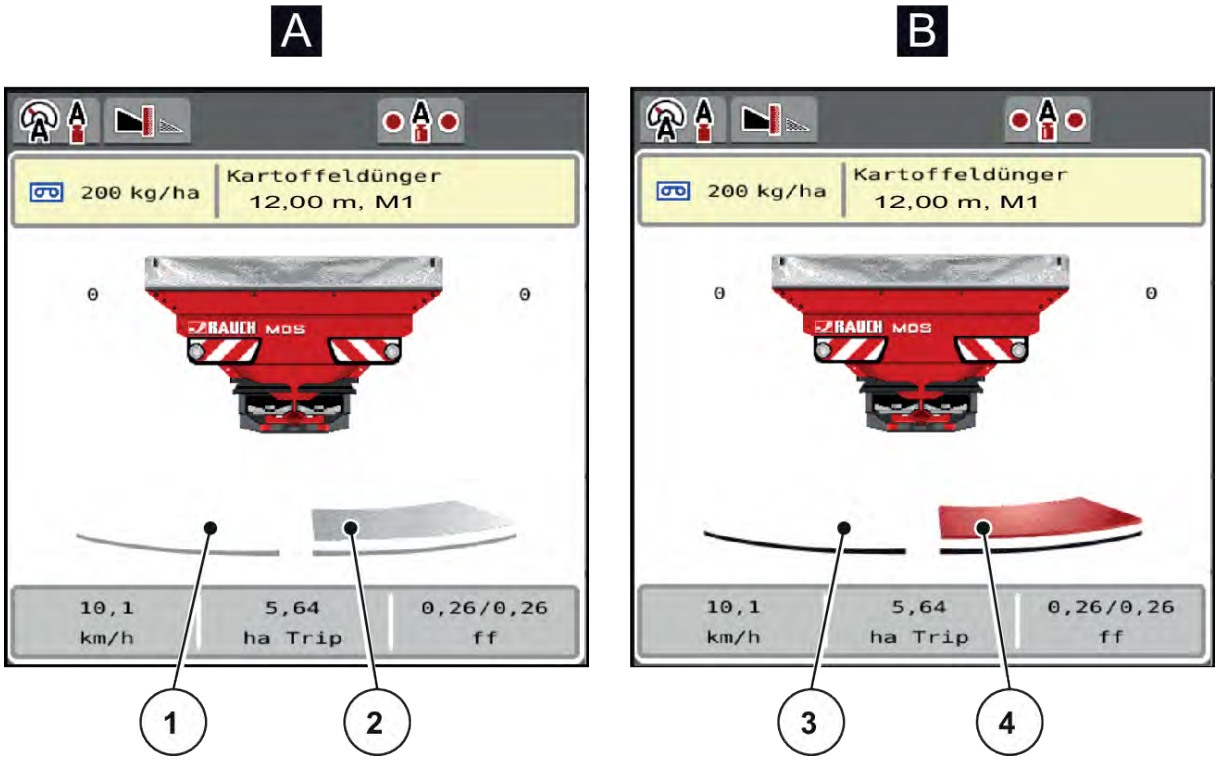


Fig. 4: Display of the metering slide status

[A] Spreading operation inactive
[1] Section deactivated
[2] Section activated

[B] Machine in spreading operation
[3] Section deactivated
[4] Section activated

■ ***Deactivating a complete spreading side***

In the border area a complete spreading side can be immediately deactivated. This is particularly helpful for a quick spreading operation in field corners.

▶ Press the section reduction softkey for longer than 500 ms.

2.3.4 Display of sections

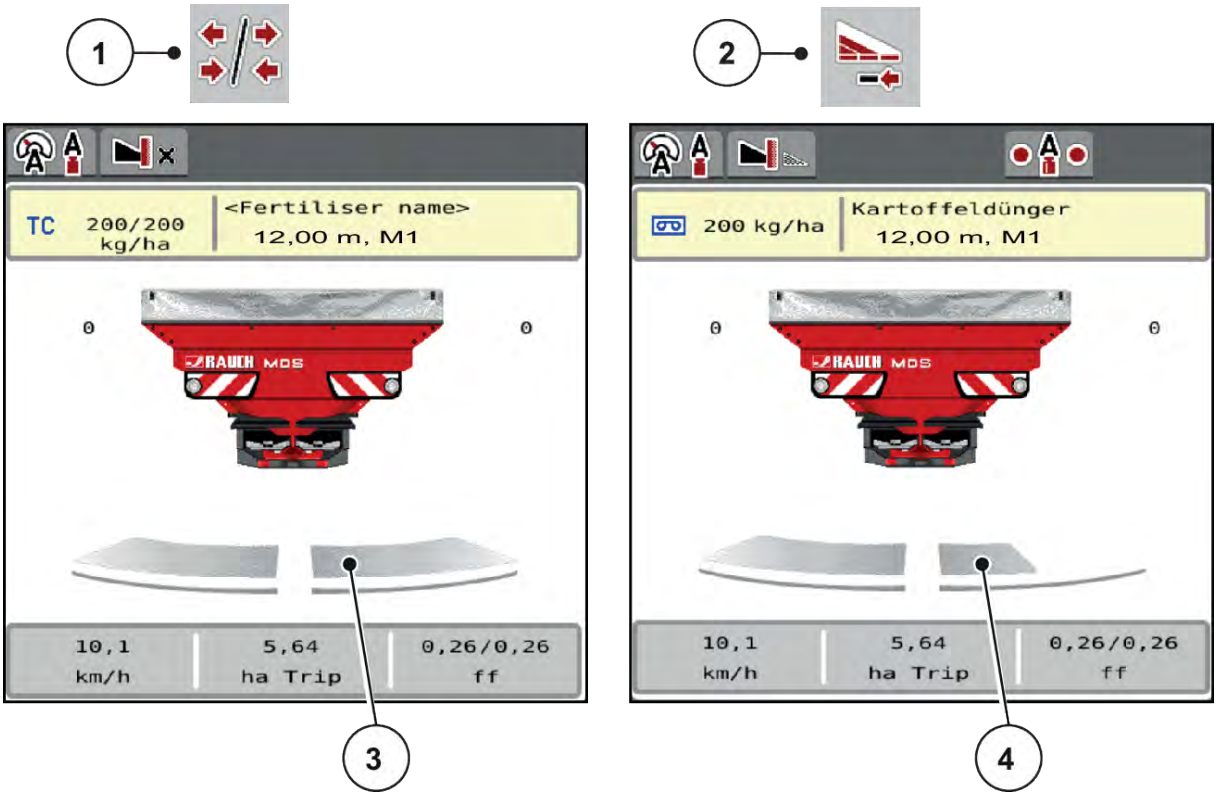


Fig. 5: Display of the section statuses

[1] Sections/border spreading toggle key
[2] Reduce right section button
[3] Activated sections on entire working width
[4] Right section is reduced by several partial sections

Further display and setting options are explained in chapter *5.3 Working with sections*.

2.4 Library of icons used

The MDS ISOBUS machine control unit displays icons for the individual menus and functions on the screen.

2.4.1 Navigation

Icon	Meaning
	Go to the left; previous page
	Go to the right; next page

Icon	Meaning
	Back to the previous menu
	Back to main menu
	Switch between working screen and menu window
	Cancellation, closing the dialog window

2.4.2 Menus

Icon	Meaning
	Switch from a menu window directly to the main menu
	Switch between working screen and menu window
	Fertilizer settings
	Machine settings
	Fast emptying
	System/Test
	Information
	Weighing/Trip counter

2.4.3 Working screen icons

Icon	Meaning
	Start spreading and control of application rate

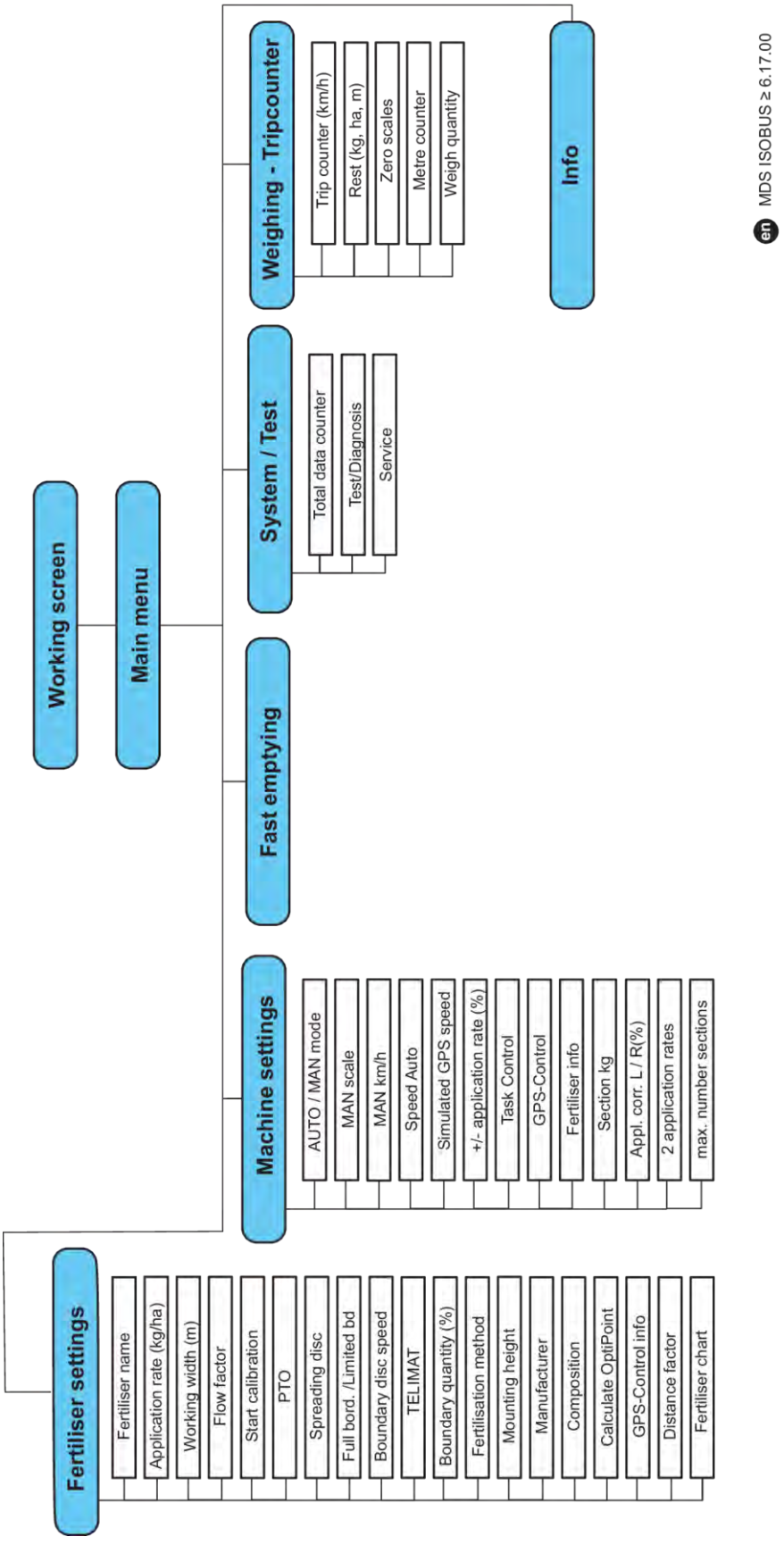
Icon	Meaning
	The spreading operation has started; stop the application rate regulation
	Reset the quantity adjustment to the pre-set application rate
	Switch between working screen and menu window
	Switch between boundary spreading and sections on the left, right or both spreading sides
	Sections on the left side, border spreading on the right spreading side
	Sections on the right side, border spreading on the left spreading side
	Border spreading on both spreading sides
	Selection of the surplus/shortage quantity on the left, the right or both spreading sides (%)
	Quantity adjustment + (plus)
	Quantity adjustment - (minus)
	Quantity adjustment, left + (plus)
	Quantity adjustment, left - (minus)
	Quantity adjustment, right + (plus)

Icon	Meaning
	Quantity adjustment, right - (minus)
	Manual quantity adjustment + (plus)
	Manual quantity adjustment - (minus)
	Left spreading side inactive
	Left spreading side active
	Right spreading side inactive
	Right spreading side active
	Reduce left section (minus) **In boundary spreading mode:** Pressing and holding (> 500 ms) immediately deactivates an entire spreading side.
	Increase left section (plus)
	Reduce section, right (minus) **In boundary spreading mode:** Pressing and holding (> 500 ms) immediately deactivates an entire spreading side.
	Increase right section (plus)
	Activate left boundary spreading function
	Left boundary spreading function active

2.4.4 Other icons

Icon	Meaning
	Start idle measurement, in the main menu
	Limited border spreading mode, in the working screen
	Full border spreading mode, in the working screen
	Limited border spreading mode, in the main menu
	Full border spreading mode, in the main menu
	Operating mode AUTO km/h + AUTO kg
	Working mode AUTO km/h
	Operating mode MAN km/h
	Operating mode MAN scale
	Loss of the GPS signal (GPS J1939)
	The minimum mass flow is undercut
	The maximum mass flow is exceeded.

2.5 Structural menu overview



3 Attachment and installation

3.1 Tractor requirements

Before installing the machine control unit, ensure that your tractor meets the following requirements:

- A minimum voltage of **11 V** must **always** be guaranteed, even if multiple loads are connected concurrently (e.g. air conditioning system, lights)
- The PTO speed must have the following values and must be complied with (basic requirement for a correct working width): min **540** rpm

On tractors without load-switchable transmission, the forward speed must be selected by using the correct gear ratio in such a way that it corresponds to a PTO speed of **540 rpm**.

- Free return min. **NW 18 mm**
- 9-pin socket (ISO 11783) located at the rear of the tractor, for connecting the machine control unit to ISOBUS
- 9-pin terminal plug (ISO 11783) for connecting an ISOBUS terminal to the ISOBUS

If the tractor is not equipped with a 9-pin socket at the rear, a tractor assembly set including a 9-pin socket for the tractor (ISO 11783) and a forward speed sensor may be purchased additionally as special equipment.

3.2 Connections, sockets

3.2.1 Power supply

The power supply of the machine control unit is implemented via the 9-pin socket at the rear of the tractor.

3.2.2 Connecting the machine control unit

Depending on the equipment, there are different methods for connecting the machine control unit to the mineral fertilizer spreader. Further information can be found in the operator’s manual of the machine.

■ Schematic connection diagram

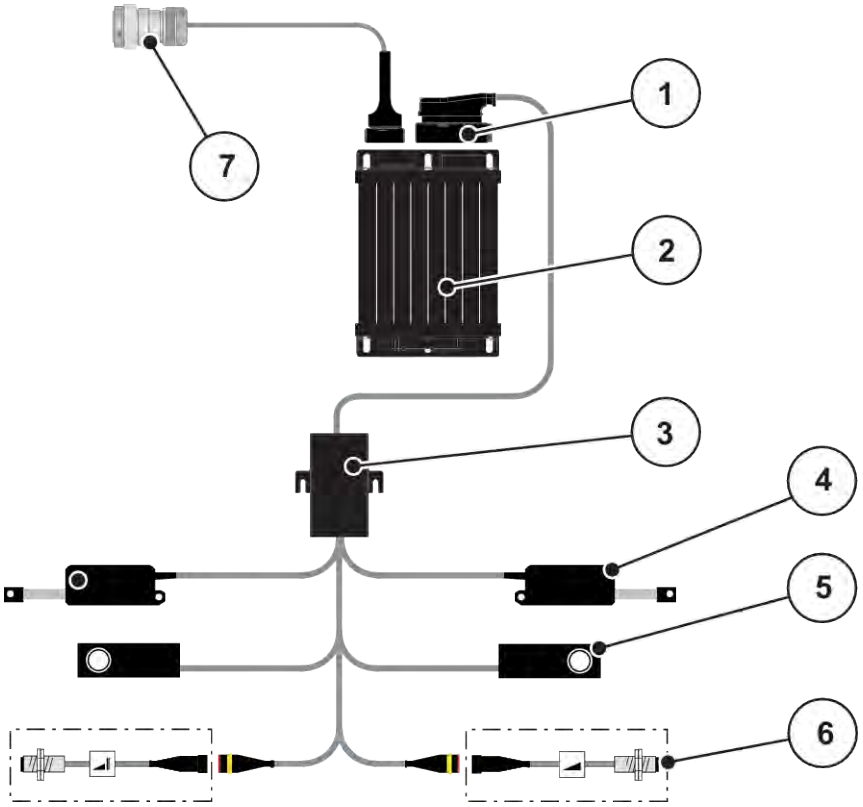


Fig. 6: Schematic connection diagram of MDS

[1] Machine plug
[2] Machine control unit
[3] Cable distributor
[4] Metering slide, left/right
[5] Weigh cell left/right
[6] TELIMAT sensors, top/bottom
[7] ISOBUS connector plug

3.2.3 Metering slide preparation

The machine control has an electronic slide actuator to set the application rate.

Refer to the operator's manual of the machine.

4 Operation

⚠CAUTION!

Risk of injury due to discharged fertilizer

In the case of a fault, it is possible that the metering slide unexpectedly opens during road transport to the spreading location. There is a risk of slipping and personal injury due to ejected fertilizer.

▶ **Before leaving for the spreading location**, always switch off the electronic machine control unit.

4.1 Switching on the machine control unit

Requirements:

- The machine control unit is correctly connected to the machine and the tractor.
  - For an example, see *3.2.2 Connecting the machine control unit*.
- The minimum voltage of **11 V** is guaranteed.

▶ Start the machine control unit.

▶ The **Start screen** of the machine control unit appears.

▶ Note any warning message and acknowledge it with the Enter key.

▶ Subsequently, the machine control unit displays the **activation menu** for a few seconds.

The working screen then appears.

4.2 Navigation within the menus

Refer to chapter *1.3.4 Menu hierarchy, keys and navigation* for important notes regarding the display and navigation between menus.
The techniques for accessing menus and menu entries **by touching the touch screen or pressing the function keys**by touching the touch screen or pressing the function keys are described below.

- Refer to the operator's manual of the terminal that is used.

■ ***Accessing the main menu***

▶ Press the **Working screen/main menu** function key. See *2.4.2 Menus*.

The main menu is displayed.

■ ***Accessing the sub-menu via the touch screen***

▶ Press the button of the desired sub-menu.

Windows appear with prompts for various actions.
- Text input
- Value input
- Settings made in further sub-menus

Not all parameters are displayed simultaneously on one screen. Use the **left/right arrow** keys to skip to the next or previous menu windows (tabs).

■ ***Exiting menus***

▶ Confirm settings by pressing the **Return** key.

Back to the **preceding menu** .

▶ Press the **working screen/main menu** key.

Back to the **working screen**.

▶ Press **ESC**.

The previous settings are retained.

Back to the **preceding menu** .

4.3 Main menu

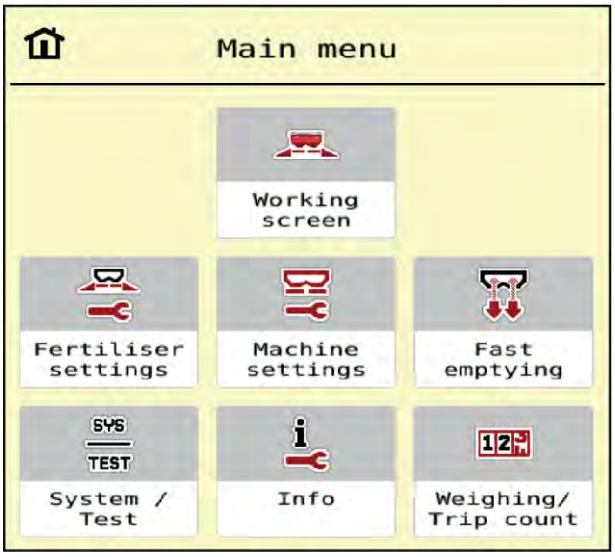


Fig. 7: Main menu with sub-menus

Sub-menu	Meaning	Description
Working screen Working screen	Switches to the working screen	
Fertiliser settings Fertiliser settings	Fertilizer and spreading operation settings	*4.4 Fertilizer settings*
Machine settings Machine settings	Tractor and machine settings	*4.5 Machine settings*
Fast emptying Fast emptying	Direct access to menu for fast emptying of the machine	*4.6 Fast emptying*
System/Test System / Test	Settings and diagnosis of the machine control unit	*4.7 System/Test*
Info Info	Machine configuration display	*4.8 Info*
Weighing / Trip count Weighing/Trip count.	Values regarding spreading work performed and functions for weighing operation	*4.9 Weighing/Trip counter*

The function keys Idle measurement and Bound. sprd.type can be selected in the main menu as well as in the sub-menus.

- Idle measurement: This function key enables a manual start of the idle measurement. See chapter *2.4.2 Menus*.
- Bound. sprd.type: Edge spreading or border spreading.

4.4 Fertilizer settings

In this menu, the fertilizer and spreading settings can be changed.

▶ Call up the Main menu > Fertiliser settings menu.

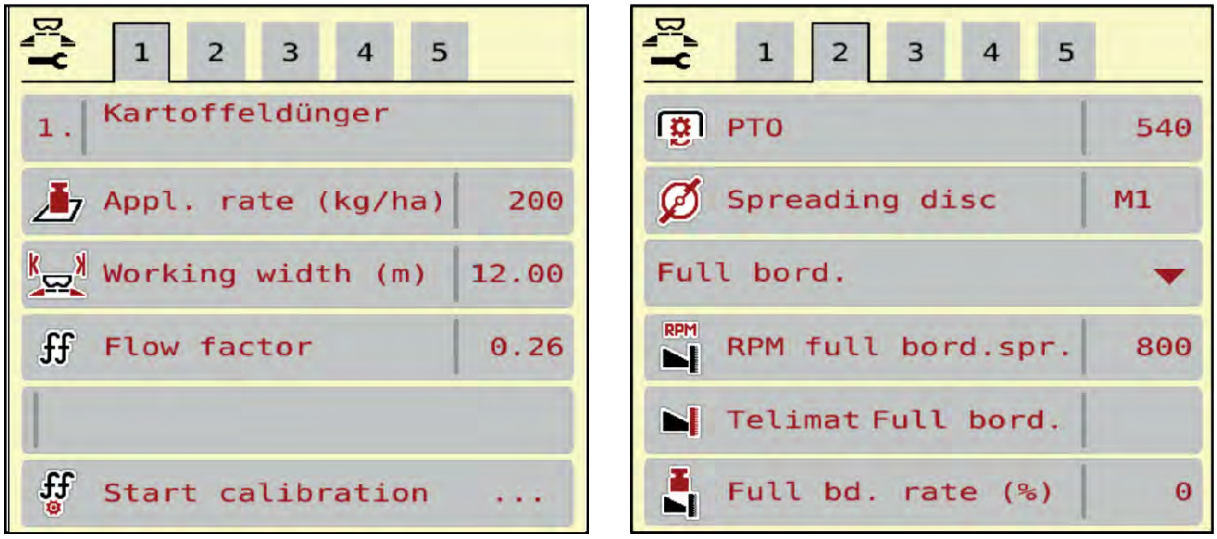


Fig. 8: Fertiliser settings menu, tab 1 and 2

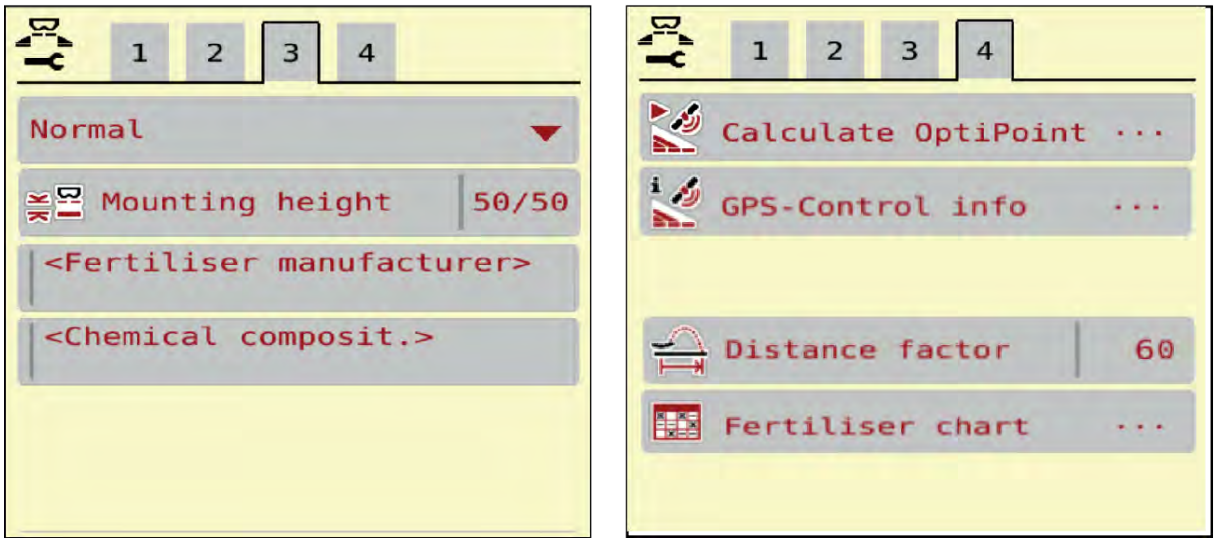


Fig. 9: Fertiliser settings menu, tab 3 and 4

Sub-menu	Meaning	Description
Fertiliser name Fertiliser name	Fertilizer selected from the fertilizer chart	*4.4.11 Fertilizer charts*
Application rate Appl. rate (kg/ha)	Inputting the set application rate in kg/ha	*4.4.1 Application rate*
Working width Working width (m)	Determination of the working width to be spread	*4.4.2 Setting the working width*
Flow factor Flow factor	Input of flow factor of the fertilizer used	*4.4.3 Flow factor*

Sub-menu	Meaning	Description
Start calibration Start calibration	Accessing the sub-menu for executing the calibration **Not available in EMC mode**	*4.4.4 Calibration test*
PTO PTO	Spreading disc speed Factory setting: • 540 rpm	*4.4.6 Rotation speed*
Spreading disc Spreading disc	Setting of the disc type mounted on the machine	Selection list: • M1 • M2
Boundary spreading type Bound. sprd.type	Selection list: • Limited bd • Full bord.	Selection with arrow keys, confirmation with the Enter key This is adjusted by means of the speed of the tractor PTO shaft.
Boundary quantity Limit. bd rate (%)	Pre-setting the application rate reduction in border spreading mode	To be entered in a separate input window
TELIMAT	Saving the TELIMAT settings for border spreading	
Fertilisation method Fertilisation method	Selection list: • Normal • Late sprd.	Selection with the **arrow keys** Confirmation with the **Enter key**
Mounting height Mounting height	Indicated in cm front/cm rear Selection list: • 0/6 • 40/40 • 50/50 • 60/60 • 70/70 • 70/76	
Manufacturer Manufacturer	Fertilizer manufacturer input	
Composition Composition	Percentage of the chemical composition	
Fertiliser class Fertilizer class	Selection list	Selection with arrow keys; Confirmation with the Enter key
Distance factor Distance factor	Input of the distance factor from the fertilizer chart. Required for OptiPoint calculation	

Sub-menu	Meaning	Description
Calculate OptiPoint Calculate OptiPoint	Input of the GPS control parameters	*4.4.9 Calculate OptiPoint*
Turn on distance Turn on dist. (m)	Input of turn on distance	
Turn off distance Turn off dist. (m)	Input of turn off distance	
GPS Control Info GPS-Control info	Display of information of the GPS Control parameters	*4.4.10 GPS Control info*
Fertiliser chart Fertiliser chart	Management of fertilizer charts	*4.4.11 Fertilizer charts*

4.4.1 Application rate

In this menu, the target value for the desired application rate can be set.

Enter the application rate:

- ▶ Call up the Fertiliser settings > Appl. rate (kg/ha) menu.

  The **currently applied** *application rate is displayed.*
- ▶ Enter the new value in the input field.
- ▶ Press **OK**.

The new value is saved in the machine control unit.

4.4.2 Setting the working width

The working width can be set in this menu.

- ▶ Call up the Fertiliser settings > Working width (m) menu.

  The working width **currently applied** *is displayed.*
- ▶ Enter the new value in the input field.
- ▶ Press **OK**.

The new value is saved in the machine control unit.

The working width cannot be adjusted whilst spreading is in progress.

4.4.3 Flow factor

The flow factor lies within the range of **0.2** to **1.9**.

With identical basic settings (km/h, working width, kg/ha), the following applies:
- If the flow factor is **increased**, the metering quantity is **reduced**
- If the flow factor is **reduced**, the metering quantity is **increased**

An error message is displayed if the flow factor is outside the preset range. See chapter *6 Alarm messages and possible causes*.

When spreading bio-fertilizers or rice, reduce the minimum flow factor to 0.2. This means the error message will not be continually displayed.

If the flow factor was obtained from earlier calibrations or from the fertilizer chart, enter it manually in this selection box.

Via the Start calibration menu, the flow factor can be determined and entered using the control unit. Refer to Chapter *4.4.4 Calibration test*

On the MDS mineral fertilizer spreader, the flow factor is calculated via the mass flow control.

The flow factor calculation depends on the operating mode used. For further information about the flow factor, see *4.5.1 AUTO/MAN mode*.

Entering the flow factor:

▶ Call up the Fertiliser settings > Flow factor menu.

The **currently set** *flow factor is displayed.*

▶ Enter the value obtained from the fertilizer chart into the input field.

If the fertilizer is not listed in the fertilizer chart, enter a flow factor of **1.00**.
In AUTO km/h operating mode, we recommend performance of a **calibration** in order to be able to accurately determine the flow factor for this fertilizer.

▶ Press OK.

The new value is saved in the machine control unit.

For the MDS mineral fertilizer spreader (AUTO km/h + AUTO kg operating mode), we recommend having the flow factor displayed on the working screen. This allows the regulation of the flow factor to be monitored during spreading. See chapter *2.3.2 Display fields*.

4.4.4 Calibration test

⚠WARNING!

Risk of injury during calibration test

Rotating machine parts and discharged fertilizer could cause injury.

- ▶ Before starting the calibration, ensure that all requirements have been met.
- ▶ Observe the calibration chapter in the operator's manual for the machine.

The Start calibration menu is locked for weighing spreaders and all machines in the **operating mode** AUTO km/h + AUTO kg. This menu item is inactive.

In this menu the flow factor is determined on the basis of a calibration and is saved in the machine control unit.

Perform the calibration:

- before spreading for the first time
- If the fertilizer quality has changed significantly (moisture, high dust content, granulate damage)
- If a new fertilizer type is used

The calibration must either be conducted with a running PTO at a standstill or while driving over a test section.

- Remove both spreading discs.

Entering the working speed:

- ▶ Call up the Fertiliser settings > Start calibration menu.
- ▶ Enter the average working speed.

  This value is required for calculation of the slide position during calibration.
- ▶ Press the Continue button.

  The new value is saved in the machine control unit.

  The second calibration page is displayed.

Select the section

- ▶ Set the spreader side on which the calibration is to be performed.

  Press the function key of the left spreading side.

  Press the function key of the right spreading side.

  The icon indicating the selected spreader side has a red background.

▶ Press **Start/Stop**.

The metering slide of the previously selected section opens and the calibration is started.

The calibration period can be interrupted at any time by pressing the ESC key. The metering slide is closed and the display shows the Fertiliser settings menu.

The calibration time is not relevant to the accuracy of the results. However, a **minimum of 20 kg** should be calibrated.

▶ Press **Start/Stop** again.

The calibration is completed.

The metering slide closes.

The third calibration page is displayed.

■ ***Calculating the new flow factor***

⚠ WARNING!

Risk of injury due to rotating machine parts

Any contact with rotating machine parts (drive shaft, hubs) may lead to bruises, abrasions, and crushing injuries. Body parts or objects may be caught or drawn in.

▶ Switch off the tractor engine.
▶ Switch off the hydraulics system and secure it against unauthorized activation.

- ▶ Weigh the collected weight (taking into account the empty weight of the collection tray).
- ▶ Enter the weight under the **Calibrated quantity** menu entry.
- ▶ Press **OK**.

  The new value is saved in the machine control unit.

  The **Flow factor calculation** *menu is displayed.*

The flow factor must be between 0.4 and 1.9.

- ▶ Set the flow factor.

  In order to apply the newly calculated flow factor, press the Confirm flow factor button.

  To confirm the previously saved flow factor, press the **ESC** key.

The flow factor is saved.

4.4.5 Disc type

For optimal idle measurement, check the correct input in the Fertiliser settings menu.

- The entries in the Spreading disc and Normal disc speed or PTO menu items must correspond to the actual settings of the machine.

The mounted type of spreading disc has a default factory setting. If other spreading discs are mounted on the machine, enter the correct type.

- ▶ Call up the Fertiliser settings > Spreading disc menu.
- ▶ Activate the type of spreading disc in the selection list.

The Fertiliser settings window is displayed with the new spreading disc type.

4.4.6 Rotation speed

■ ***PTO***

For an optimum empty run measurement, check the correct input in the Fertiliser settings menu.

- The entries in the Spreading disc and PTO menu items must correspond to the actual settings of the machine.

The specified PTO speed is preset in the control unit to 540 rpm as a standard factory setting. To use a different PTO speed, change the saved value in the control unit.

- ▶ Call up the Fertiliser settings > PTO menu.
- ▶ Enter the speed in rpm.

The Fertiliser settings window is displayed with the new PTO speed.

Refer to the *5.4 Spreading with the automatic operating mode (AUTO km/h + AUTO kg)* chapter.

4.4.7 Boundary spreading mode

This menu allows selection of the suitable mode for spreading at the edge of the field.

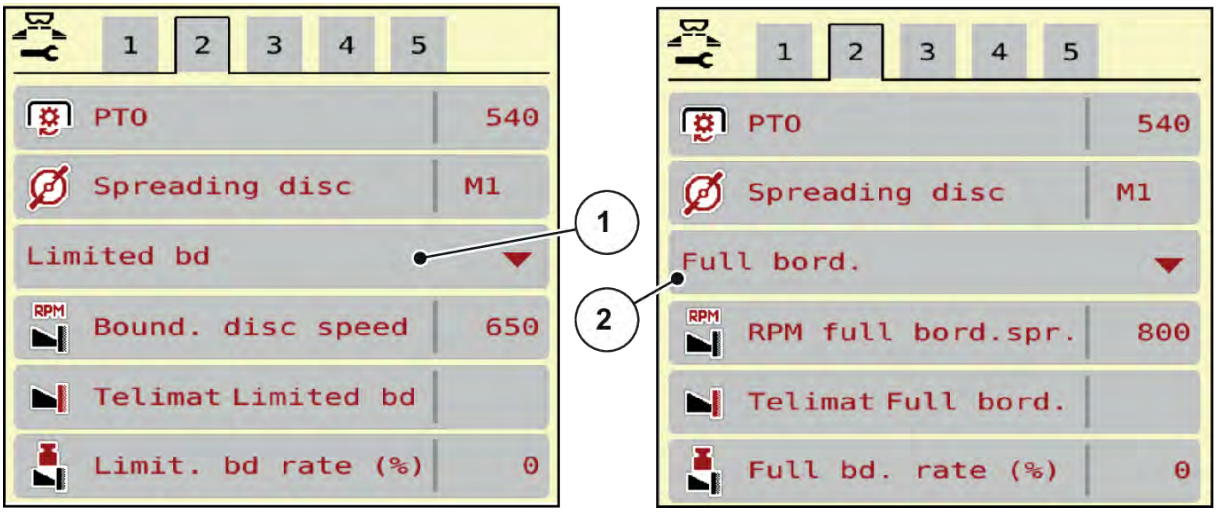


Fig. 10: Border spreading mode setting values

[1] Limited bd - edge spreading

[2] Full bord. - border spreading

- ▶ Call up the menu Fertiliser settings.
- ▶ Switch to tab 2.
- ▶ Select border spreading mode Full bord. or Limited bd.
- ▶ If required, adjust the RPM, or quantity reduction in accordance with the information provided in the fertilizer chart.

4.4.8 Boundary spreading quantity

The menu informs you of the calculated setting values (as a percentage). This setting is used for the activation of the border spreading function and/or the TELIMAT function.

We recommend reducing the quantity on the border spreading side by 20 %.

Entering the border spreading application rate:

- ▶ Access the menu Fertiliser settings > Limit. bd rate (%).
- ▶ Enter the value in the input field and confirm.

The Fertiliser settings window is displayed with the new border spreading application rate.

4.4.9 Calculate OptiPoint

The parameters for calculating the optimum turn-on and turn-off distances in the headlands can be entered in the Calculate OptiPoint menu. For an accurate calculation, it is very important to enter the distance factor for the fertilizer used.

The calculation should be performed only after all the data for the desired spreading process have been transferred in the Fertiliser settings menu.

See the fertilizer chart for the machine for the aerodynamic factor for the fertilizer being used.

- ▶ Enter the required value in the menu Fertiliser settings > Distance factor.
- ▶ Call up the Fertiliser settings > Calculate OptiPoint menu.

  The first page of the Calculate OptiPoint menu is displayed.

The indicated forward speed refers to the forward speed in the area of the switching positions! See *5.9 GPS control*.

- ▶ Enter the average forward speed in the range of switching positions.

  The second page of the menu is displayed.
- ▶ Press OK.
- ▶ Press the Continue button.

  The third page of the menu is displayed.

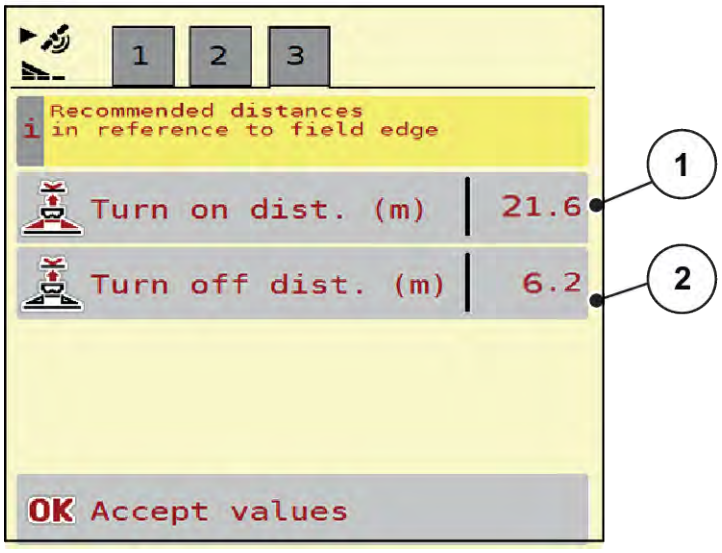


Fig. 11: Calculate OptiPoint, page 3

Number	Meaning	Description
[1]	Turn on dist - Turn on dist. (m) Distance from the field border (in meters) at which the metering slides open.	*Turn on distance (m)*
[2]	Turn off dist - Turn off dist. (m) Distance from the field border (in meters) at which the metering slides close.	*Fig. 34 Distance off (measured from field border)*

The parameter values can be adjusted manually on this page. See *5.9 GPS control*.

Changing the values

- ▶ Open the desired list entry.
- ▶ Enter the new values.
- ▶ Press OK.
- ▶ Press the Accept values - Accept values button.

The OptiPoint is calculated.

The machine control unit switches to the GPS-Control info window.

4.4.10 GPS Control info

The GPS-Control info menu provides information about the setting values that were entered in the Calculate OptiPoint menu.

Depending on the terminal used, the display will show 2 distances (CCI, Müller Elektronik) or 1 distance and 2 time values (John Deere, etc.).

- With most ISOBUS terminals, the values displayed here are applied automatically to the corresponding settings menu of the GPS terminal.
- With some terminals, however, a manual entry is required.

This menu is for information purposes only.

- Refer to the operator's manual of the GPS terminal.

- ▶ Call up the Fertiliser settings > GPS-Control info menu.

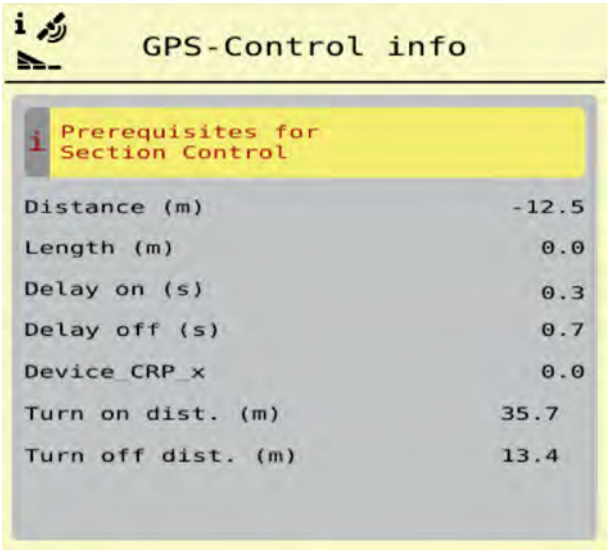


Fig. 12: GPS Control info - GPS-Control info menu

4.4.11 Fertilizer charts

The fertilizer charts are created and managed in this menu.

Selecting a fertilizer chart affects the machine, fertilizer settings and the machine control unit. The set application rate is overwritten by the stored value from the fertilizer chart.

■ ***Creating a new fertilizer chart***

Up to 30 fertilizer charts can be created in the electronic machine control unit.

[1] Indicates a fertilizer chart filled with values
[2] Indicates an active fertilizer chart
[3] Fertilizer chart name field
[4] Empty fertilizer chart
[5] Chart number

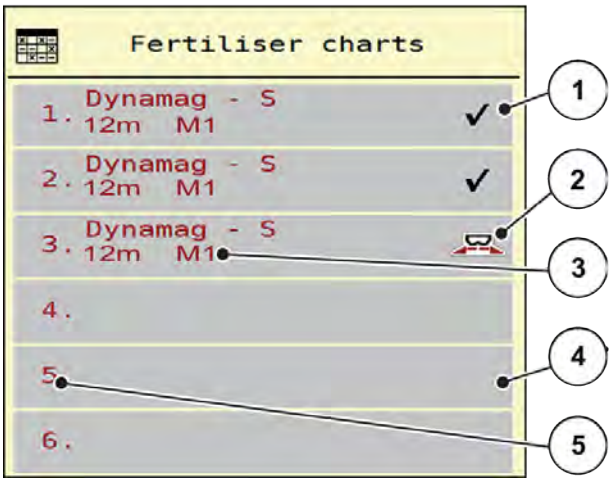


Fig. 13: Fertiliser charts - Fertiliser charts menu

▶ Call up the Fertiliser settings > Fertiliser charts menu.

▶ Select an empty fertilizer chart.

The name field consists of the fertilizer name, the working width and the spreading disc type.

The display shows the selection window.

▶ Press the option Open and back to fertiliser settings.

The Fertiliser settings menu is displayed and the selected element is loaded into the fertilizer settings as the active fertilizer chart.

▶ Call up the Fertiliser name menu item.

▶ Enter a name for the fertilizer chart.

We recommend naming the fertilizer chart after the fertilizer. This allows the fertilizer chart for a fertilizer to be more easily recognized and accessed.

▶ Edit the parameters of the fertilizer chart. See *4.4 Fertilizer settings*.

■ ***Selecting a fertilizer chart***

▶ Access the menu Fertiliser settings > Open and back to fertiliser settings.

▶ Select the desired fertilizer chart.

The display shows the selection window.

▶ Select the option Open and back to spreading mat. settings.

The Fertiliser settings menu is displayed and the selected element is loaded into the fertilizer settings as the active fertilizer chart.

When selecting an existing fertilizer chart, all values in the Fertiliser settings menu will be overwritten with the stored values obtained from the selected fertilizer chart, including the drop point and the normal disc speed.

■ ***Copying an existing fertilizer chart***

▶ Select the desired fertilizer chart.

The display shows the selection window.

▶ Select the option Copy element.

A copy of the fertilizer chart is now in the first free position on the list.

■ ***Deleting an existing fertilizer chart***

▶ Select the desired fertilizer chart.

The display shows the selection window.

The active fertilizer chart cannot be deleted.

▶ Select the option Delete element.

The fertilizer chart is deleted from the list.

■ ***Managing the selected fertilizer chart via the working screen***

The fertilizer chart can also be managed directly on the working screen

- ▶ Press the fertilizer chart button [2] on the touch screen.

  The active fertilizer chart is displayed.
- ▶ Enter the new value in the input field.
- ▶ Press OK.

The new value is saved in the machine control unit.

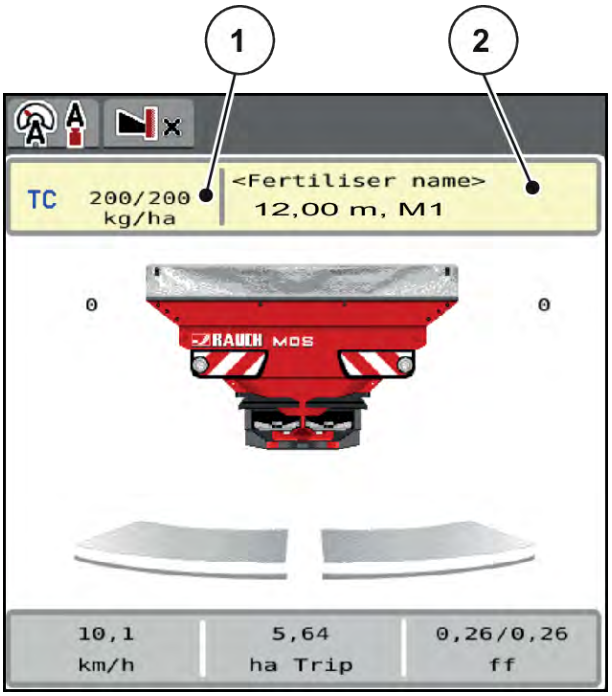


Fig. 14: Managing the fertilizer chart via the touch screen

[1] Button Application rate [2] Button Fertiliser chart

4.5 Machine settings

The settings for the tractor and the machine can performed in this menu.

- ▶ Call up the menu Machine settings.

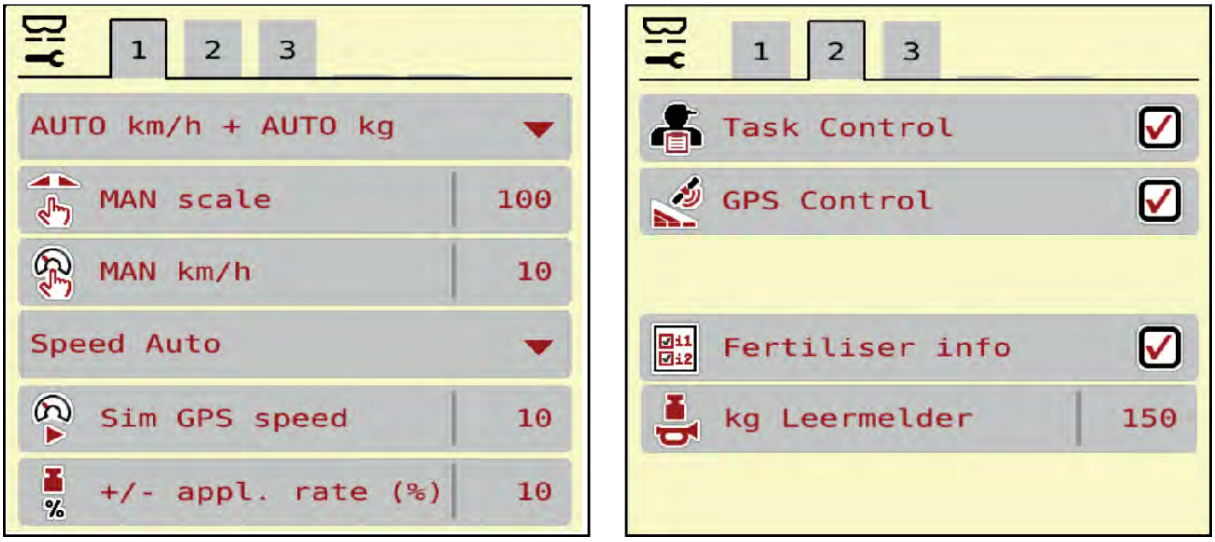


Fig. 15: Machine settings menu, tab 1 and 2

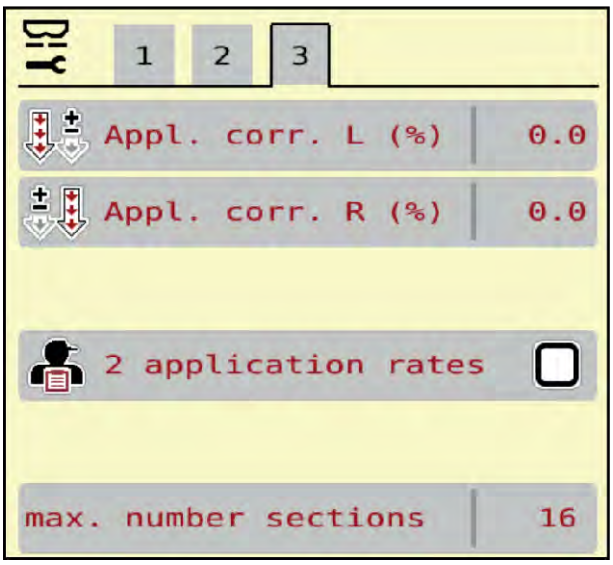


Fig. 16: Machine settings menu, tab 3

Sub-menu	Meaning	Description
AUTO/MAN mode AUTO/MAN mode	Specifying automatic or manual operating mode	*4.5.1 AUTO/MAN mode*
MAN scale MAN scale	Setting the manual scale value. (only influences the respective operating mode)	To be entered in a separate input window.
MAN km/h MAN km/h	Setting the manual speed. (only influences the respective operating mode)	To be entered in a separate input window.
Speed signal source Speed/signal source	Selection/limitation of the speed signal • Speed AUTO (automated selection of either transmission or radar/GPS [1]) • GPS J1939 [1] • NMEA 2000	
Sim GPS speed Sim GPS speed	For GPS J1939 only: Indication of forward speed in the event of loss of the GPS signal	**NOTE!** The entered forward speed is to be maintained constantly at all times.
+/- appl. rate (%) +/- appl. rate (%)	Presetting for the change of quantity	To be entered in a separate input window

[1]) The manufacturer does not assume any liability in the event of a loss of the GPS signal.

Sub-menu	Meaning	Description
Task Control Task Control	Activation of the ISOBUS Task Controller functions for documentation and for application map spreading • Task Control on (checked) • Task Control off	
GPS-Control GPS-Control	Activation of the function to control the machine sections via GPS control unit • Task Control on (checked) • Task Control off	
Fertiliser info Fertiliser info	Activation of the fertilizer information (fertilizer name, type of spreading disc, working width) in the working screen	
kg level sensor kg level sensor	Input of the remaining quantity to trigger an alarm message via the weigh cells	
Application rate correction • Appl. corr L - Appl. corr. L (%) • Appl. corr R - Appl. corr. R (%)	Correction of the deviations between the entered application rate and the actual application rate • Correction in percent on the right and/or left side	
2 application rates 2 application rates	Only when working with application maps: Activation of two separate application rates for the right and left side, respectively	

4.5.1 AUTO/MAN mode

The machine control unit automatically adjusts the metering quantity according to the speed signal. This adjustment is influenced by the application rate, working width, and flow factor.

It is normal to work with the machine in **automatic** mode.

Manual mode is used only in the following cases:
- If there is no speed signal (radar or wheel sensor not available or defective)
- Application of slug pellets or seeds (fine seeds)

For uniform spreading of the spreading material, a **constant forward speed** must be maintained in manual operating mode.

Spreading in the different working modes is described in *5 Spreading operation*.

Menu	Meaning	Description
AUTO km/h + AUTO kg	Select automatic mode with EMC control or automatic weighing Only for MDS W or AXIS M W	Page *63*
AUTO km/h + static kg	Selecting automatic mode with static weighing Only for MDS W or AXIS M W	Page *65*
AUTO km/h	Selecting automatic mode	Page *64*
MAN km/h	Adjustment of forward speed for manual mode	Page *66*
MAN scale	Metering slide adjustment for manual mode This operating mode is suitable for spreading slug pellets or fine seeds.	Page *67*

Selecting the operating mode

- ▶ Start the machine control unit.
- ▶ Call up the Machine settings > AUTO/MAN mode menu.
- ▶ Select the desired menu item from the list.
- ▶ Press OK.
- ▶ Follow the instructions on the screen.

We recommend that the flow factor is displayed on the working screen. This allows monitoring of the mass flow control whilst spreading. See *2.3.2 Display fields*.

Important information on the use of operating modes for spreading operations is provided in chapter *5 Spreading operation*.

4.5.2 +/- quantity

This menu allows setting of the percentage increment of the **application rate change** for normal spreading.

The preset value of the metering slide opening serves as the basis (100 %).

Function keys during operation:

- + Quantity/- Quantity: The spreading quantity can be changed at any time by means of the +/- Quantity factor.
- C 100 % key back to the default values.

Specifying the application rate reduction:

▶ Call up the Machine settings > +/- appl. rate (%) menu.

▶ Enter the percentage by which the application rate is to be changed.

▶ Press OK.

4.6 Fast emptying

In order to quickly clean the machine after spreading or to quickly empty any residual material, select the Fast emptying menu.

For this purpose, before placing the machine in storage, we recommend **completely opening** the metering slides with the fast emptying function and switching off the control unit in this state. This prevents the build-up of moisture in the hopper.

Before starting the fast emptying process, make sure that all the requirements have been met. To do this, refer to the operator's manual for the mineral fertilizer spreader (discharging residual material).

Carrying out the fast emptying process:

- ▶ Call up the Main menu > Fast emptying menu.
- ▶ Press the **function key** to select the section for which the fast emptying function is to be performed.

  The selected section is displayed as an icon (Fig. 17 position [3]).
- ▶ Press **Start/Stop**.

  The fast emptying process starts.
- ▶ Press **Start/Stop** when the hopper is empty.

  Fast emptying is complete.
- ▶ ESC to return to the Main menu.

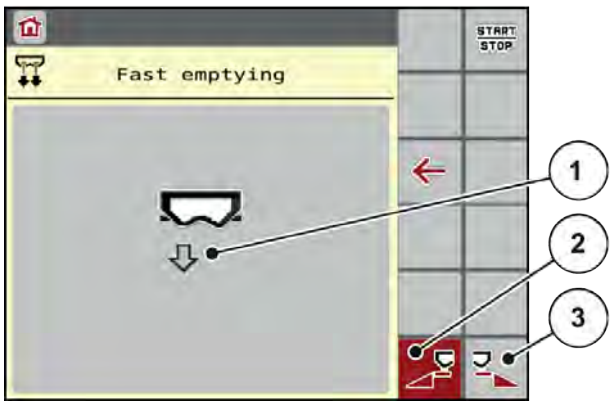


Fig. 17: Fast emplying - Fast emptying menu

[1] Symbol for fast emptying (here: left side selected, not started)
[2] Fast emptying of the left section (selected)
[3] Fast emptying of the right section (not selected)

Before placing the machine in storage, completely empty the hopper via the machine control unit.

Complete discharge:

- ▶ Select both sections.
- ▶ Press **Start/Stop**.

  Both metering slides open.

  The drop point moves to the left and to the right, to the value 0.

- ▶ Press and hold the Complete discharge button.

  The drop point moves between the values 9.5 and 0 to allow the fertilizer to flow out.
- ▶ Release the **Complete discharge** button.

  The left and right drop point moves back to the value 0.
- ▶ Press **Start/Stop**.

  The drop point automatically moves to the pre-set value.

4.7 System/Test

In this menu, the system and test settings for the machine control unit can be configured.

▶ Call up the Main menu > System / Test menu.

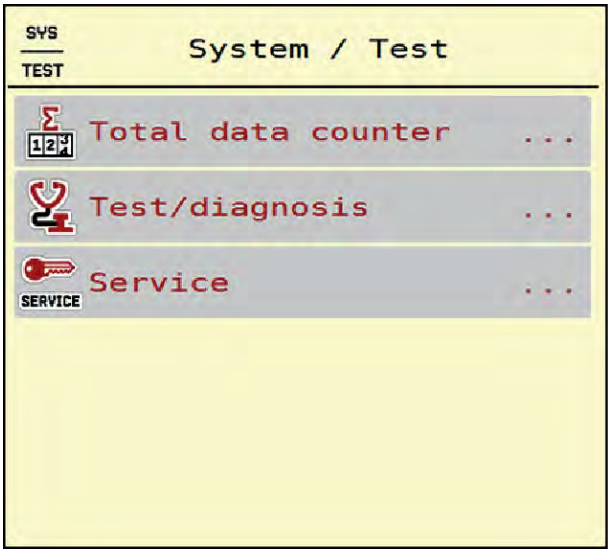


Fig. 18: System / Test - System / Test menu

Sub-menu	Meaning	Description
Total data counter Total data counter	Display list • spread quantity in kg • spread area in ha • spread time in h • distance traveled in km	*4.7.1 Total data counter*
Test/diagnosis Test/diagnosis	Checking of actuators and sensors	*4.7.2 Test/diagnosis*
Service Service	Service settings	Password-protected; only accessible for service personnel

4.7.1 Total data counter

In this menu, all of the spreader's counter readings are displayed.

This menu is for information purposes only.

- kg calculated - kg calculated: spread quantity in kg
- ha - ha: spread area in ha
- hours - hours: spread time in h
- km - km: distance traveled in km

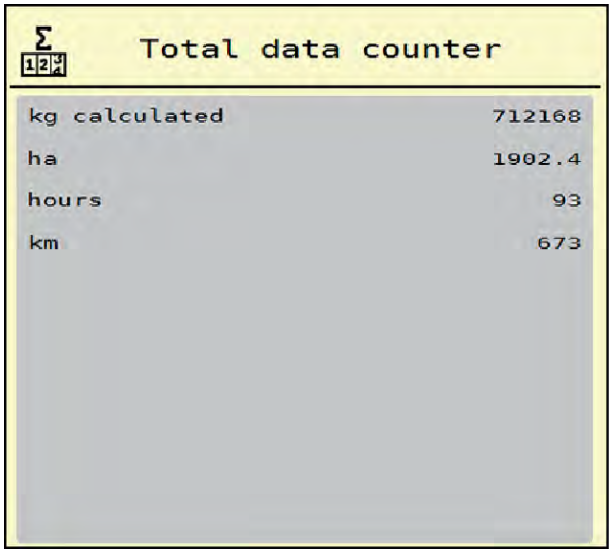


Fig. 19: Total data counter - Total data counter menu

4.7.2 Test/diagnosis

The Test/diagnosis menu allows the functions of all actuators and sensors to be checked.

This menu is for information purposes only.

The list of sensors depends on the equipment of the machine.

⚠CAUTION!

Risk of injury due to moving machine parts

During the tests, machine parts may move automatically.

▶ Check that there are no personnel anywhere near the machine.

Sub-menu	Meaning	Description
Voltage Voltage	Checking the operating voltage	
Metering slide Metering slider	Moving the left and right metering sliders	*Example of metering slides*
Test points metering slide Test points slider	Test for approaching the various position points of the metering sliders	Calibration check
Spreading disc Spreading disc	Manual activation of the spreading disc	

Sub-menu	Meaning	Description
Agitator Agitator	Checking the agitator	
Weigh cells Weigh cell	Checking the sensors	

■ ***Example of metering slides***

▶ Call up the Test/diagnosis > Metering slider menu.

The display shows the status of the motors/ sensors and the test points of the metering slides.

The Signal display shows the status of the electrical signals for the left and right side separately.

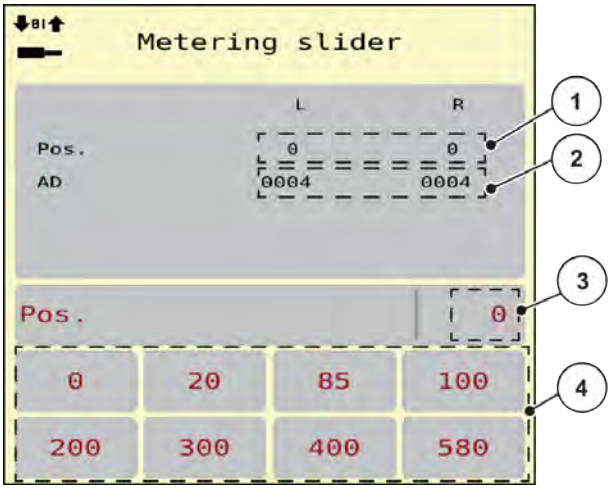


Fig. 20: Test/diagnosis; Example: Metering slider - Metering slider

[1] Signal display
[2] AD values
[3] Manual input of the position
[4] Test points of the metering slides

⚠CAUTION!

Risk of injury due to moving machine parts

During the tests, machine parts may move automatically.

▶ Check that there are no personnel anywhere near the machine.

The up/down arrows can be used to open and close the metering slides.

4.7.3 Service

An input code is required to configure the settings in the Service menu. These settings can only be modified by authorized service personnel.

4.8 Info

The Info menu provides information on the machine control unit.

This menu provides information on the configuration of the machine.

The information list depends on the equipment of the machine.

4.9 Weighing/Trip counter

This menu provides values regarding spreading work performed and functions for the weighing operation.

▶ Call up the Main menu > Weighing/Trip count. menu.

The Weighing/Trip count. menu appears.

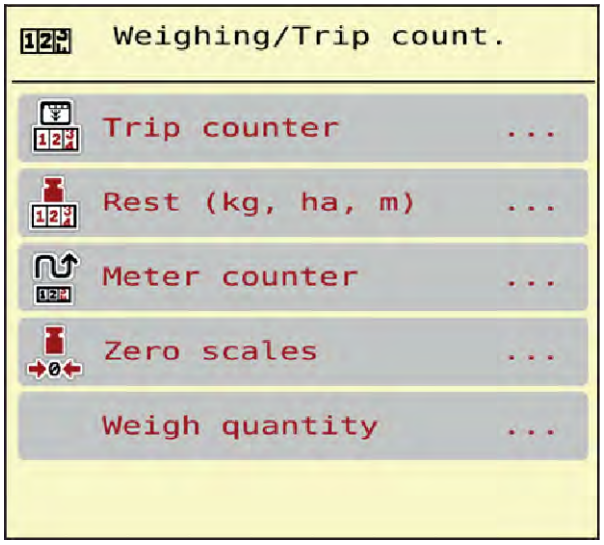


Fig. 21: Menu Weighing/Trip count.

Sub-menu	Meaning	Description
Trip counter Trip counter	Display of the fertilizer quantity spread, area spread, and spread distance	*4.9.1 Trip counter*
Rest (kg, ha, m) Rest (kg, ha, m)	For weighing spreaders only: Display of the quantity remaining in the machine hopper	*4.9.2 Rest (kg, ha, m)*
Meter counter Meter counter	Display of the distance traveled since the last reset of the meter counter	Reset (zeroing) by pressing the **C 100%** key
Zero scales Zero scales	Only with weigh cells (W): Weighing value for empty scales is set to “0 kg”	*4.9.3 Zero scales*

Sub-menu	Meaning	Description
Weigh quantity Weigh quantity	Weigh out the hopper and calculate a new calibration factor only visible when AUTO Km/h+ Stat.kg is active	*Chapter 4.9.4 - Weigh quantity - Page 52*

4.9.1 Trip counter

In this menu, the values of the spreading work performed can be interrogated, the remaining spreading quantity can be monitored and the trip counter can be reset by deleting the value.

▶ Call up the Weighing/ Trip count > Trip counter menu.

The Trip counter menu appears.

During spreading, i.e. with the metering slides open, the display can be switched to the Trip counter menu, where the current values can be viewed.

For continuous monitoring of the values during spreading, the values kg trip, ha trip or m trip can be assigned to the freely selectable display fields in the working screen, see *2.3.2 Display fields*.

Clear down the trip counter

▶ Access the sub-menu Weighing/Trip count. > Trip counter.

The values for spread quantity, area, and distance calculated since the last deletion are displayed.

▶ Press the Delete trip counter - Delete trip counter button.

All values of the trip counter are reset to 0.

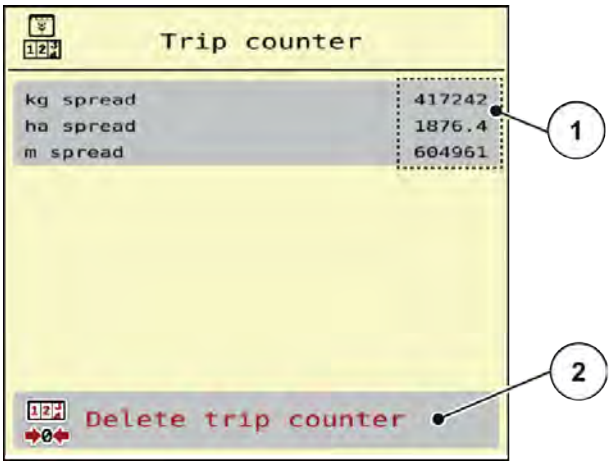


Fig. 22: Trip counter - Trip counter menu

[1] Spread quantity, area and distance display fields

[2] Delete trip counter - Delete trip counter

4.9.2 Rest (kg, ha, m)

The Rest (kg, ha, m) menu can be interrogated to check the quantity remaining in the hopper. The menu indicates the possible area (ha) and distance (m) which can still be spread with the remaining fertilizer quantity.

The current fill weight **in the weighing spreader can only be determined by weigh cells (W)**. In all other spreaders, the remaining fertilizer quantity is calculated from the fertilizer and machine settings as well as from the drive signal, and the filling quantity must be entered manually (see below). The Application rate and Working width values cannot be changed in this menu. They are for information purposes only.

▶ Call up the Weighing/Trip count. > Rest (kg, ha, m) menu.

The Rest (kg, ha, m) menu appears.

[1] kg rest - kg left input field
[2] Appl. rate (kg/ha) - Application rate, Working width (m) - Working width display fields, and the available spread area and distance

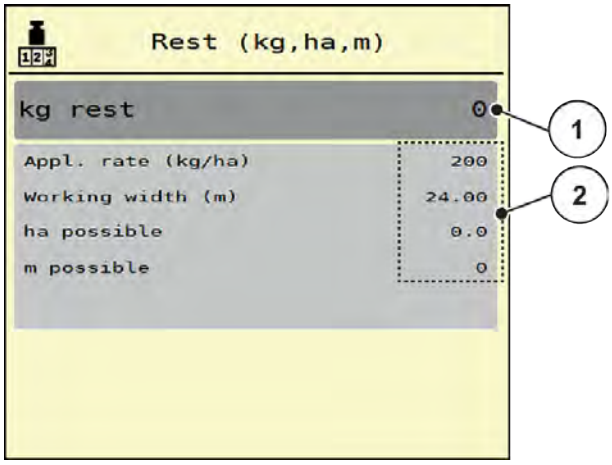


Fig. 23: Rest (kg, ha, m) - Rest (kg, ha, m) menu

For machines without weigh cells

▶ Fill the hopper.

▶ In the Rest (kg) area, enter the total weight of the fertilizer left in the hopper.

The unit calculates the values for the possible spread area and distance.

4.9.3 Zero scales

■ ***Only with weigh cells (W)***

In this menu, set the weighing value for the empty hopper to 0 kg.

For taring the scales, the following requirements have to be fulfilled:
- the hopper is empty,
- the machine is at a standstill,
- the PTO is switched off,
- the machine is in a horizontal position and off the ground,
- The tractor is at a standstill.

Zero scales:

▶ Call up the Weighing/Trip count. > Zero scales menu.

▶ Press the Zero scales button.

The weighing value for the empty scales is now set to 0 kg.

Tare the scales before each use in order to ensure problem-free calculation of the remaining quantity.

4.9.4 Weigh quantity

When the machine control unit is started or when the hopper is being filled, this menu offers a choice between filling with the previous fertilizer or filling with different fertilizer. If the selection was made in advance and at least 150 kg has been spread since the selection was made, the Weigh remain. quant. function allows a new calibration factor "revolutions/kg" to be calculated and loaded.

The Weigh quantity menu
- is active only when the menu AUTO km/h + static kg has been selected.
- is displayed automatically when the machine control unit is started or the hopper is being filled.
- can be opened from the Weigh Trip Counter menu.

[1] Quantity weighed from the hopper
[2] Type of filling
[3] Function Weigh remain. quant.

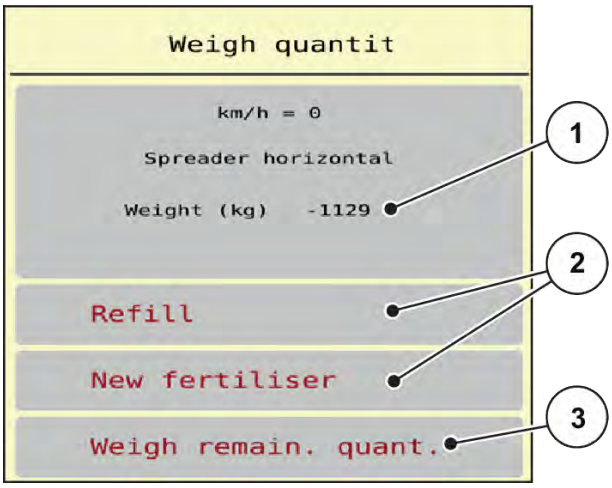


Fig. 24: Menu Weigh quantity

NOTICE!

If the menu is quit by pressing ESC, this either fails to trigger calculation of the calibration factor, or triggers an incorrect calculation of the calibration factor.

Do not press the ESC button. This may trigger an incorrect calculation of the calibration factor revolutions/kg.

▶ For confirmation of the weighing function, **always** select the type of filling.

Selecting the type of filling:

▶ Press the Refill button or New fertiliser button.

▷ Refill: Continuing to spread the same fertilizer. The saved calibration factor (revolutions/kg) is retained.

▷ New fertiliser: The calibration factor is set to 1.0 revolutions/kg. If required, the desired calibration factor can be entered retrospectively.

Calculating a new calibration factor using the Weigh Residual Quantity function:

You can execute the Weigh remain. quant. function **only** if you have made the selection between New fertiliser or Refill and at least 150 kg has been spread since the selection was made. The software compares the quantity that was distributed against the actual residual quantity remaining in the hopper, and recalculates the calibration factor on that basis.

For weighing the residual quantity remaining in the hopper, the following requirements must be fulfilled

- The machine is in a horizontal position and off the ground,
- The tractor is at a standstill.
- The machine control unit is switched on.

▶ Call up the Weighing/Trip count. > Weigh quantity menu.

▶ Press the Weigh Residual Quantity button.

The calibration factor will now be recalculated. The old and new calibration factors will be displayed in the Calculation menu.

Check the calculated value for plausibility. If the new value deviates too far from the old value, a working error may have occurred. If in doubt, perform a calibration test.

▶ Loading the new calibration factor or discarding it.

▷ Press the “OK” button: The new value for revolutions/kg will be entered as the new calibration factor.

▷ Press the “back” arrow or switch to the main menu: The new value for revolutions/kg will be discarded. The machine will continue to use the old value for revolutions/kg.

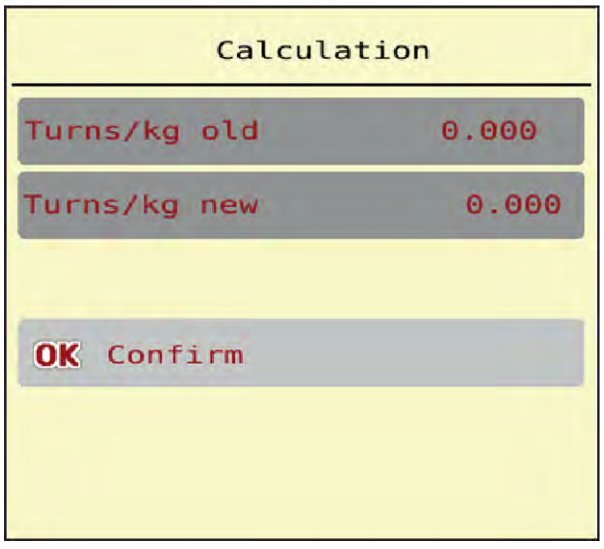


Fig. 25: Menu Calculation

4.10 Special functions

4.10.1 Changing the system of units

The settings are performed in the ISOBUS terminal.

- ▶ Open the Settings menu for the terminal system.
- ▶ Call up the menu Unit.
- ▶ Select the desired unit system from the list.
- ▶ Press OK.

All values of the various menus are converted.

Menu/value	Conversion of metric to imperial units
kg left	1 x 2.2046 lb.-mass (lbs left)
ha left	1 x 2.4710 ac (ac left)
Working width (m)	1 x 3.2808 ft
Rate (kg/ha)	1 x 0.8922 lbs/ac
Mounting height cm	1 x 0.3937 in

Menu/value	Conversion of metric to imperial units
lbs left	1 x 0.4536 kg
ac left	1 x 0.4047 ha
Working width (ft)	1 x 0.3048 m
Appl. rate (lb/ac)	1 x 1.2208 kg/ha
Mounting height in	1 x 2.54 cm

4.10.2 Using the joystick

A joystick may also be used as an alternative to the settings in the working screen of the ISOBUS terminal.

Contact your dealer if you wish to set up the use of a joystick.

- Please refer to the instructions in the operator's manual of the ISOBUS terminal.

■ CCI A3 joystick

Fig. 26: CCI A3 Joystick, front and rear

[1] Light sensor
[2] Display/touch panel
[3] Plastic grid (replaceable)
[4] Shift key

■ CCI A3 Joysticks operating levels

The Level key allows switching between three operating levels. The plane that is active in each case is indicated by the position of an illuminated bar at the lower edge of the display.

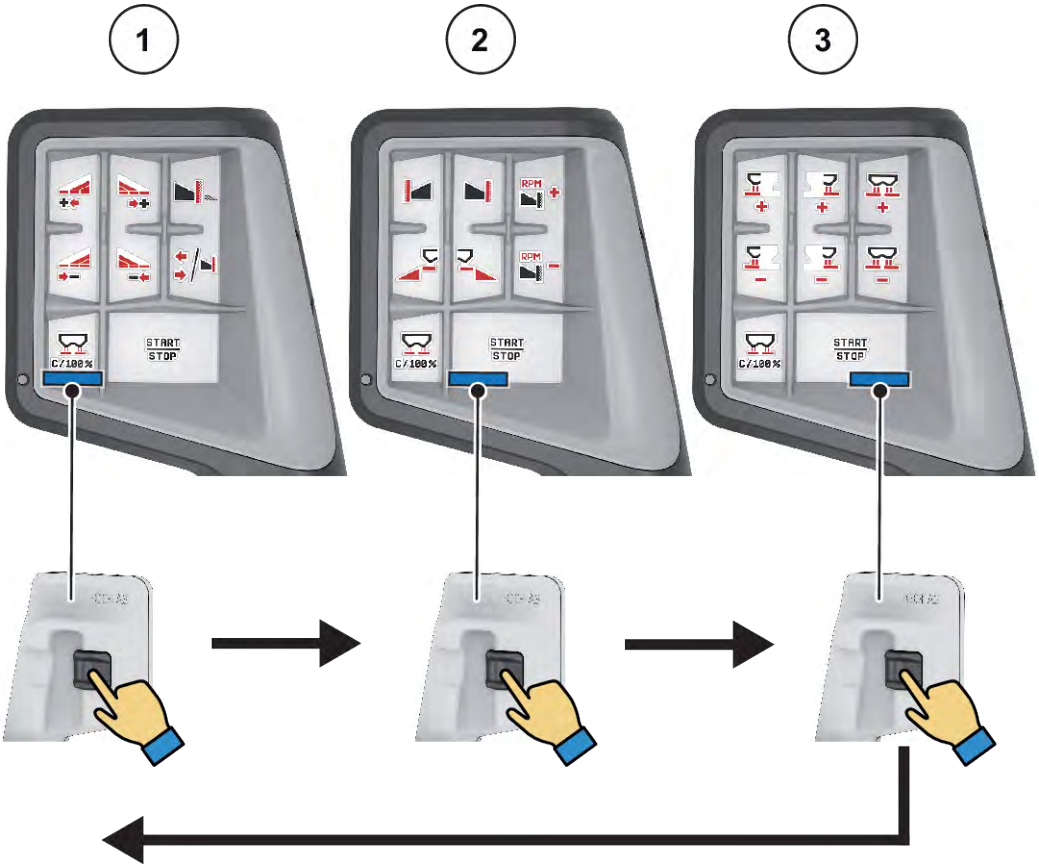


Fig. 27: CCI A3 joystick, operating level display

[1] Level 1 active
[2] Level 2 active
[3] Level 3 active

■ CCI A3 joystick button functions

The joystick offered is pre-programmed with specific functions at the factory.

For the meaning and function of the symbols see *2.4 Library of icons used*.

The assignment of the keys differs from one machine type to another.

[1] Button functions Level 1
[2] Button functions Level 2
[3] Button functions Level 3

To change the assignment of level functions to the three keys, see the instructions in the joystick operator’s manual.

5 Spreading operation

The machine control unit helps you to enter the machine settings before starting work. During spreading, functions of the machine control unit are also active in the background. This allows you to monitor the quality of the fertilizer spreading.

5.1 Requesting the remaining quantity during spreading

■ ***Only with weigh cells (W)***

During spreading, the remaining quantity is continuously weighed and displayed.

During spreading, switch to the Trip counter menu, where the current value for the quantity remaining in the hopper can be viewed.

For continuous monitoring of the values during spreading, assign the values kg left, ha left or m left to the freely selectable display fields in the working screen, see *2.3.2 Display fields*.

5.2 TELIMAT boundary spreading unit

⚠CAUTION!

Risk of injury due to automatic adjustment of the TELIMAT unit!

When the **boundary spreading key** is pressed, an electrical positioning cylinder automatically moves the machine to the boundary spreading position. This may cause injury and property damages.

▶ Before pressing the **boundary spreading key**, make sure that nobody is present in the hazard zone of the machine.

The TELIMAT option is preset for the control unit at the factory!

TELIMAT with hydraulic remote control

The TELIMAT unit is hydraulically moved to its working or idle position. The TELIMAT equipment is activated and deactivated by pressing the border spreading key. Depending on the position, the display shows or hides the **TELIMAT icon**.

TELIMAT with hydraulic remote control and TELIMAT sensors

If TELIMAT sensors are connected and activated, the **TELIMAT icon** is shown on the display when the TELIMAT border spreading unit is hydraulically moved into its operating position.

If the TELIMAT unit is moved back to the idle position, the **TELIMAT icon** is hidden again. The sensors monitor the TELIMAT adjustment and automatically activate or deactivate the TELIMAT unit. The border spreading key has no function with this option.

If the status of the TELIMAT unit cannot be detected for more than 5 seconds, alarm message 14 will be displayed; see *6.1 Meaning of the alarm messages*.

5.3 Working with sections

5.3.1 Displaying the spreading type in the operating screen

The machine control unit offers 2 different spreading types for the spreading operation. These settings can be configured directly in the working screen. During the spreading operation, you can switch between the spreading types in order to optimally adapt to the field requirements.

Button	Spreading type
	Activate section on both sides
	Section on the right, border spreading function available on the left

▶ Press the function key several times until the desired spreading type is displayed.

5.3.2 Spreading with reduced sections: VariSpread V8

You can spread fertilizer to sections on one or both sides, to adapt the full spreading width to the field requirements. Every spreading side can be set continuously in the automatic mode and to a maximum of 4 steps in the manual mode.

▶ Press the border spreading/sections toggle key.

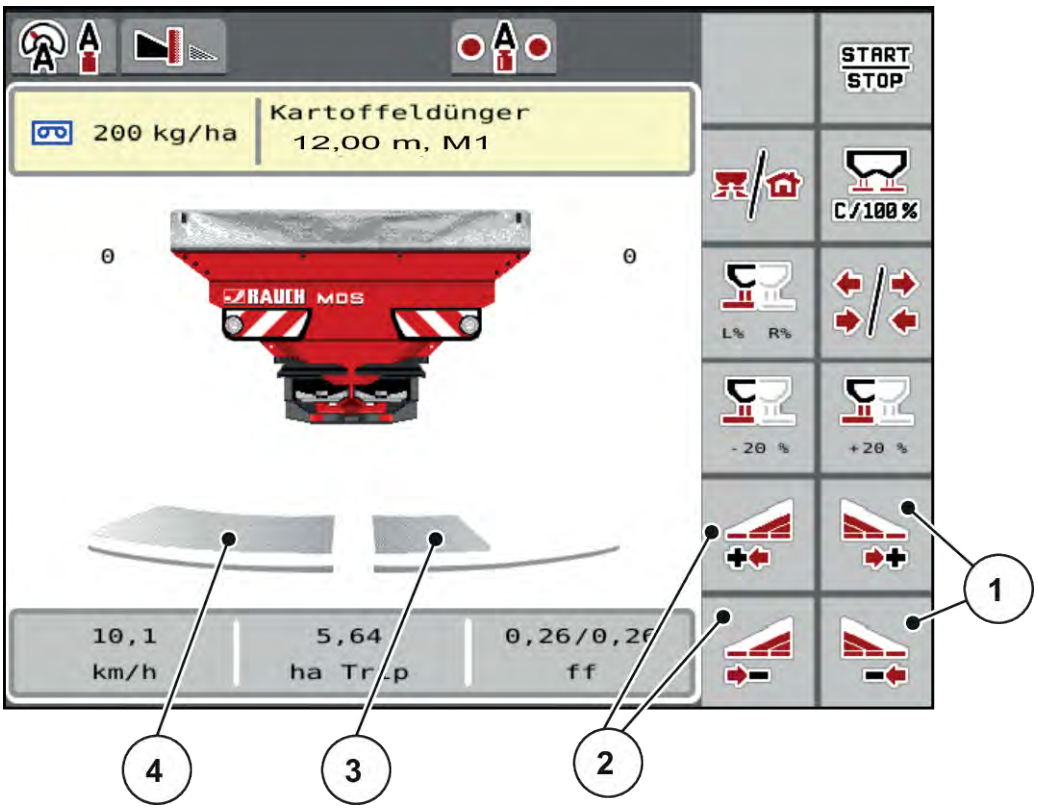


Fig. 28: Working screen: Sections with 4 levels

[1] Function keys for increasing or reducing the spreading width on the right

[2] Function keys for increasing or reducing spreading width on the left

[3] The right section is reduced to 2 steps.

[4] The left spreading side spreads across the entire half.

- Each section can be reduced or increased in steps.

▶ Press the reduce left spreading width or the reduce right spreading width function key.

The section of the spreading side will be reduced by one step.

▶ Press the Increase left spreading width function key or the Increase right spreading width function key.

The section of the spreading side will be increased by one step.

The sections are **not** graded proportionally. The VariSpread spreading width assistant sets the spreading widths automatically.

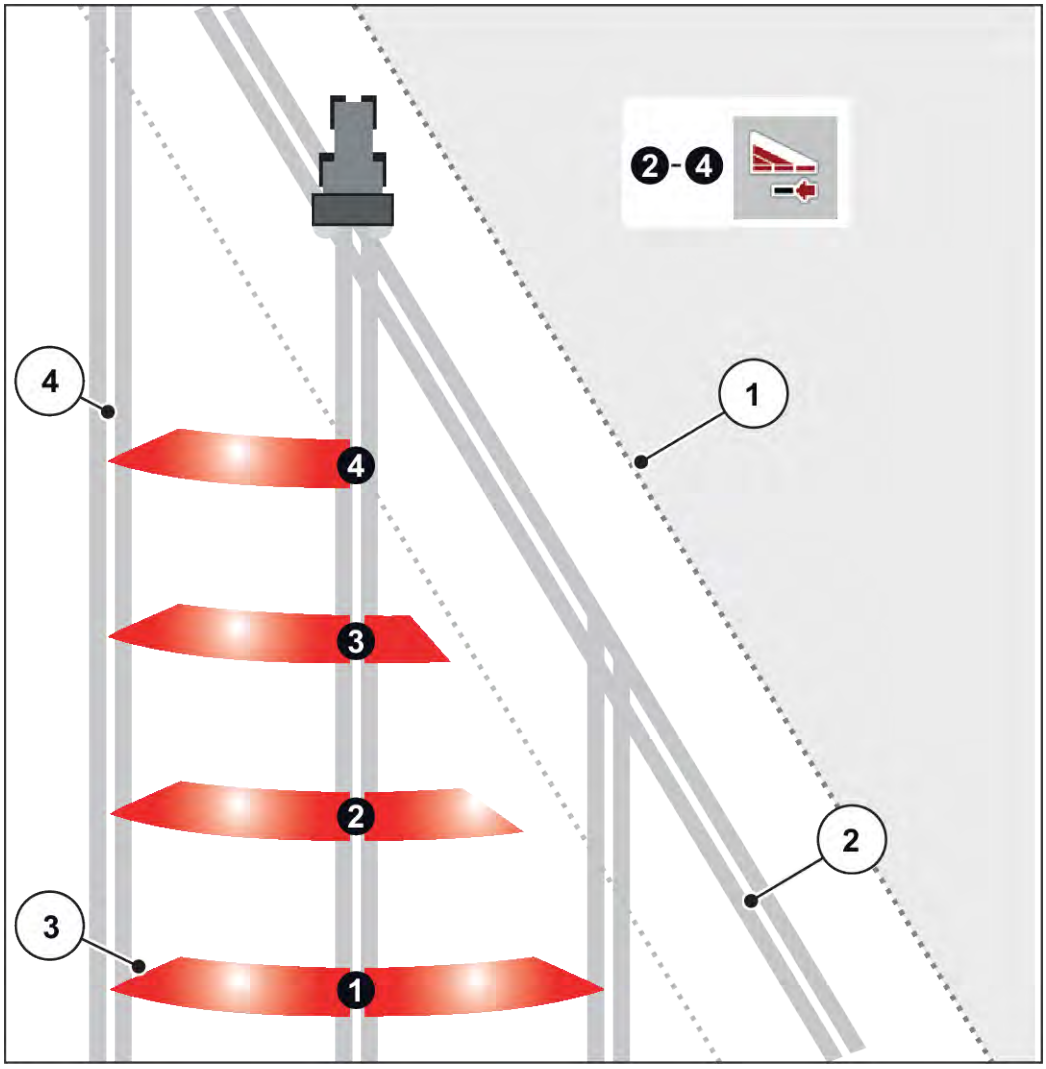


Fig. 29: Automatic section control

[1] Field edge
[2] Headlands tramline
[3] Sections 1 to 4: Section reduction on the right hand side
[4] Tramline in the field

5.3.3 Spreading operation with one section and in boundary spreading mode

■ ***VariSpread V8***

During spreading operation, the sections can be changed gradually and border spreading can be deactivated. The figure below shows the working screen with border spreading activated and a section activated.

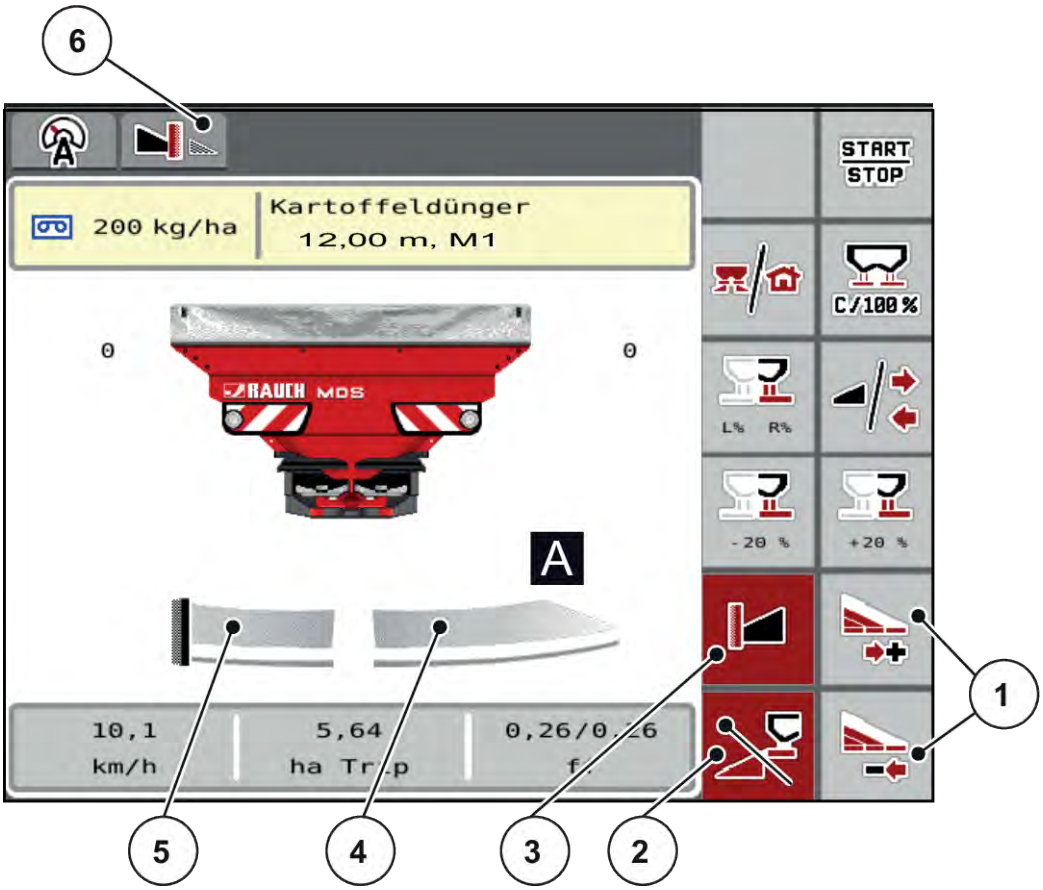


Fig. 30: Working screen with one section on the right, border spreading side on the left

[1] Reduce or increase the right section
[2] The left spreading side is activated
[3] Border spreading mode is activated
[4] Left section adjustable in 4 steps
[5] Spreading side on the left in border spreading mode
[6] The current border spreading mode is the boundary.

- The application rate on the right is set to the full working width.
- The **left border spreading** function key has been pressed, border spreading is active, and the application rate is reduced by 20%.

Function keys:
- **Reduce the spreading width on the right**: Steplessly reduce the section.
- **C/100 %**: immediately revert to the full working width
- Left border spreading: border spreading is deactivated.

The border spreading function is also available in automatic mode with GPS Control. The border spreading side must be manually operated at all times.

- See *5.9 GPS control*.

5.4 Spreading with the automatic operating mode (AUTO km/h + AUTO kg)

The AUTO km/h + AUTO kg operating mode allows for continuous regulation of the application rate during the spreading operation. The mass flow control is corrected at regular intervals on the basis of this information. This way, fertilizer metering can be optimized.

The AUTO km/h + AUTO kg operating mode is preselected as the standard factory default.

Requirements for spreading:

- The AUTO km/h + AUTO kg working mode is active (see *4.5.1 AUTO/MAN mode*).
- The fertilizer settings are defined:
  - Application rate (kg/ha)
  - Working width (m)
  - Spreading disc
  - PTO speed (rpm)

▶ Fill the hopper with fertilizer.

⚠WARNING!

Risk of injury caused by ejected fertilizer

Ejected fertilizer may cause severe injury.

▶ Make sure nobody is present in the spreading zone of the machine before switching on the spreading discs.

Start or stop the transmission **at low PTO speeds only**.

▶ Activate the PTO.

▶ Press the Enter key to acknowledge the alarm message. See *6.1 Meaning of the alarm messages*.

▶ Press Start/Stop

The spreading starts.

We recommend displaying the flow factor in the working screen (refer to *2.3.2 Display fields*), in order to monitor the mass flow control while spreading.

In the event of problems with flow factor control (clogging, ...), after troubleshooting at a standstill, switch to the Fertilizer settings menu and enter the flow factor 1.0.

Resetting the flow factor

If the flow factor has fallen below the minimum value (0.4 and/or 0.2), alarm no. 47 and/or 48 will appear: see *6.1 Meaning of the alarm messages*.

5.5 Spreading with the AUTO km/h operating mode

Operate by default in this working mode for machines that lack a weighing system.

In this working mode the application rate can be reduced to a value as low as 1 kg/ha.

Requirements for spreading:

- The AUTO km/h working mode is active (see *4.5.1 AUTO/MAN mode*).
- The fertilizer settings are defined:
  - Application rate (kg/ha),
  - Working width (m)
  - Spreading disc
  - PTO speed (rpm)

▶ Fill the hopper with fertilizer.

In order to achieve an optimum spreading result in the AUTO km/h working mode, a calibration should be performed before starting spreading.

▶ Perform a calibration to determine the flow factor or obtain the flow factor from the fertilizer chart and enter the flow factor manually.

⚠ WARNING!

Risk of injury caused by ejected fertilizer

Ejected fertilizer may cause severe injury.

▶ Make sure nobody is present in the spreading zone of the machine before switching on the spreading discs.

▶ Activate the PTO.

▶ Press Start/Stop.

The spreading starts.

5.6 Spreading with the AUTO km/h + static kg working mode

■ ***Operating mode AUTO km/h + static kg***

In this operating mode the **flow factor** is determined statically by means of the weigh cells.

For use only with mass flows < 30 kg/min or on hilly or very uneven ground.

▶ Switch on the machine control unit.

▶ Call up the Machine settings > AUTO/MAN mode - AUTO/MAN mode menu.

▶ Select the operating mode AUTO km/h + static kg.

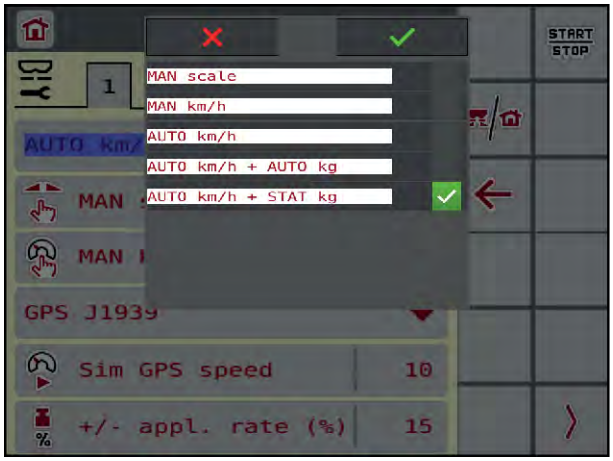
▶ Acknowledge with the green check.

▶ Fill the hopper with fertilizer.

▷ Filling weight > 150 kg

▷ The Weigh quantity - Weigh quantity window is displayed.

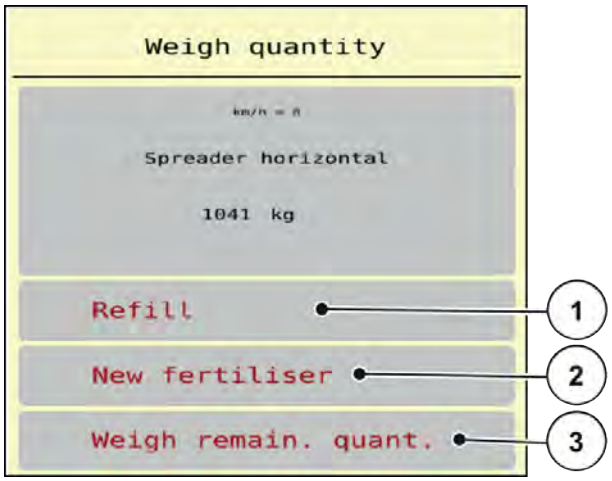
The machine control unit switches to the working screen.



▶ When first filling with a new type of fertilizer, select New fertiliser [2].

▷ The spreader must be standing horizontally.

Selecting New fertiliser resets the flow factor to 1.0 FF.



[1] Refill - Refill

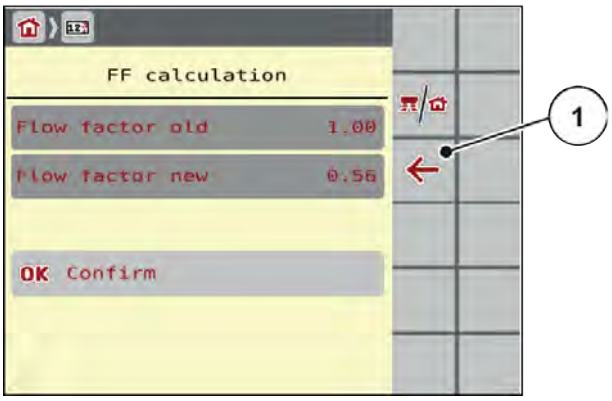
[2] New fertiliser - New fertiliser

[3] Weigh remain. quant. - Weigh remain. quant.

Recalculating the flow factor

- ▶ After spreading a quantity > 150 kg.
- ▶ Select Weigh remain. quant. - Weigh remain. quant..
- ▶ Select Flow factor new - FF calculation.

The machine control unit switches to the working screen.



5.7 Spreading with the MAN km/h operating mode

Operate in the MAN km/h operating mode is active if there is no speed signal available.

- ▶ Call up the Machine settings > AUTO/MAN mode menu.
- ▶ Select the MAN km/h menu item.

  The display shows the input window Forward speed.
- ▶ Enter the value for the forward speed during spreading.
- ▶ Press OK.
- ▶ Configure the fertilizer settings:
  - ▷ Application rate (kg/ha)
  - ▷ Working width (m)
- ▶ Fill the hopper with fertilizer.

In order to achieve an optimum spreading result in the MAN km/h operating mode, a calibration should be performed before starting spreading.

- ▶ Perform a calibration to determine the flow factor or obtain the flow factor from the fertilizer chart and enter the flow factor manually.
- ▶ Activate the PTO.

- ▶ Press Start/Stop

The spreading starts.

Always maintain the set forward speed during spreading.

5.8 Spreading in the MAN scale operating mode

In the MAN scale operating mode the metering slide aperture can be adjusted manually during the spreading operation.

Select manual mode:

- If there is no speed signal (radar or wheel sensor not available or defective)
- when spreading slug pellets or fine seeds

The MAN scale operating mode is appropriate for slug pellets and fine seeds since the automatic mass flow control cannot be activated due to the low weight reduction.

For uniform spreading of the spreading material, a constant forward speed must be maintained in manual operating mode.

[1] Display of metering slide target value scale position
[2] Display of current metering slide scale position
[3] Application rate adjustment

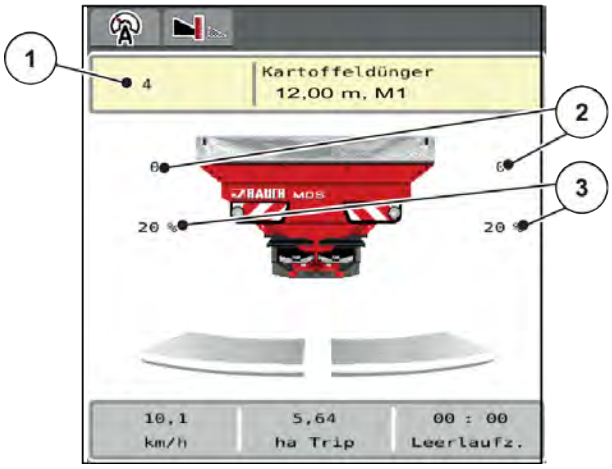


Fig. 31: MAN scale working screen

▶ Call up the Machine settings > AUTO/MAN mode menu.

▶ Select the MAN scale menu item.

The Position of dosing slider opening window is displayed.

▶ Enter the scale value for the aperture of the metering slide.

▶ Press OK.

▶ Switch to the working screen.

▶ Activate the PTO.

▶ Press Start/Stop.

The spreading starts.

▶ To change the metering slide aperture, press the MAN+ or MAN- function key.
  ▷ L% R% for selecting the side on which the metering slide aperture is to be adjusted
  ▷ MAN+ to increase the metering slide aperture or
  ▷ MAN- to reduce the metering slide aperture.

In order to achieve an optimum spreading result in manual mode as well, we recommend using the metering slide aperture and forward speed values provided in the fertilizer chart.

5.9 GPS control

The machine control unit can be combined with an ISOBUS terminal with SectionControl. Various data are exchanged between the two devices to achieve automated control.

The ISOBUS terminal with SectionControl communicates the specifications for the opening and closing of dosing sliders to the machine control unit.

The **A** symbol next to the spreading wedges indicates that the automatic function is enabled. The ISOBUS terminal with SectionControl opens and closes the individual sections depending on the respective position in the field. Spreading starts when the **Start/Stop** button is pressed.

⚠ WARNING!

Risk of injury due to discharged fertilizer

The SectionControl function automatically starts the spreading operation without warning.

Ejected fertilizer can harm the eyes and nasal mucous membranes.

There is also a risk of slipping.

▶ Ensure that nobody is present in the hazard zone during the spreading operation.

During spreading, **one or several sections** can be closed at any time. If the sections are activated for automatic operation again, the state last requested is restored.

If the ISOBUS terminal with SectionControl is changed from automatic mode to manual mode, the machine control unit closes the metering slides.

For the use of the **GPS control** functions of the machine control unit, the GPS-Control setting in the Machine settings menu must be activated!

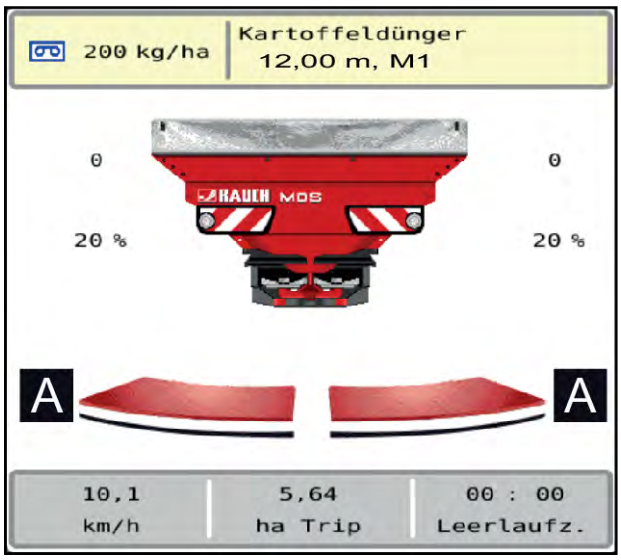


Fig. 32: Spreading operation display in the working screen with GPS Control

The **OptiPoint** functions calculate the optimal turn on and turn off positions for spreading in the headlands based on the settings in the machine control unit; refer to *4.4.9 Calculate OptiPoint*.

To ensure correct configuration of the **OptiPoint** function, enter the correct aerodynamic factor for the fertilizer being used. The aerodynamic factor can be obtained from the fertilizer chart for the machine.

See *4.4.9 Calculate OptiPoint*.

■ *Turn on distance (m)*

The Turn on dist. (m) parameter refers to the switch-on distance [A] measured from the field border [C]. At this position in the field, the metering sliders open. This distance depends on the type of fertilizer and represents the ideal switch-on distance for optimized fertilizer distribution.

[A] Turn on distance
[C] Field border

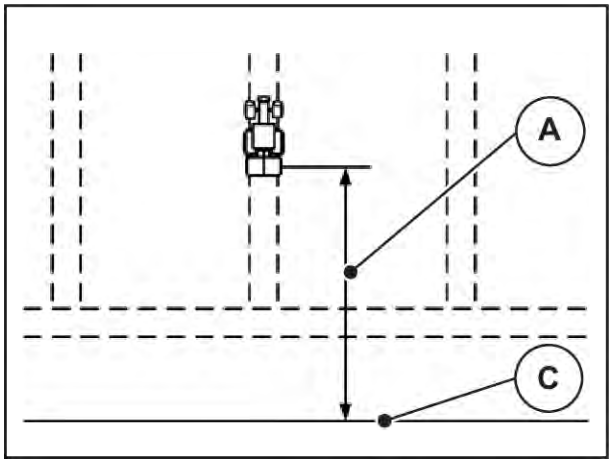


Fig. 33: Distance on (measured from field border)

To change the switch-on position within the field, modify the Turn on dist. (m) value to suit.

- A lower value for this distance means that the switch-on position is closer to the field border.
- A greater value means that the switch-on position is closer to the center of the field.

■ *Turn off distance (m)*

The Turn off dist. (m) parameter refers to the turn off distance [B] measured from the field border [C]. At this position in the field, the metering sliders start to close.

[B] Turn off distance
[C] Field border

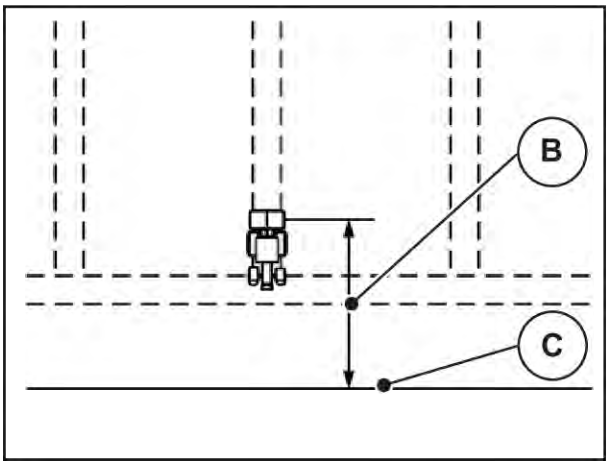


Fig. 34: Distance off (measured from field border)

To change the switch-off position within the field, modify the Turn off dist. (m) value to suit.

- A lower value means that the switch-off position is closer to the field border.
- A greater value means that the switch-off position is closer to the center of the field.

OptiPoint Pro limits the switch-off distance to a minimum value depending on the fertilizer settings. The reason for this is the calculation in the section control algorithm.

To turn within the headland track, enter a larger distance in Turn off dist. (m). Here, the adjustment must be as low as possible so that the metering slides close as soon as the tractor enters the headland track. An adjustment of the switch-off distance may lead to insufficient fertilization around the switch-off positions in the field.

6 Alarm messages and possible causes

6.1 Meaning of the alarm messages

Various alarm messages can be displayed on the ISOBUS terminal display.

No.	Message in display	Meaning and possible cause
1	Fault in dosing system, stop !	The motor of the metering system cannot reach the specified target value: • Blockage • No position feedback
2	Max. outlet reached! Speed or application rate too high	Metering slide alarm • The maximum metering opening is reached. • The set application rate (+/- quantity) exceeds the maximum metering opening.
3	Flow factor is outside limits	The flow factor must lie within a range between 0.40 and 1.90. • The newly calculated or entered flow factor is outside this range
14	Error by setting TELIMAT	Alarm for the TELIMAT sensor This error message is displayed if the TELIMAT status is not detected for more than 5 seconds.
15	Memory full, Delete one private fertiliser chart	A maximum of 30 fertilizer types are stored in the memory for the fertilizer charts.
20	Error at LIN bus participant:	Communication problem • Defective cable • Loose plug connector
21	Spreader overloaded!	For weighing spreaders only: The fertilizer spreader is overloaded. • Too much fertilizer in the hopper
22	Unknown condition Function-Stop	Communication problem with terminal • Possible software error

No.	Message in display	Meaning and possible cause
23	Error by setting TELIMAT	The TELIMAT adjustment cannot reach the specified target value. • Blockage • No position feedback
24	Defect by setting TELIMAT	Defective TELIMAT actuator
28	Disc could not start up properly. Deactivate disc start.	Spreading discs do not rotate. • Blockage • No position feedback
29	The agitator motor is overloaded.	The agitator is blocked. • Blockage • Defective connection
30	The discs shall be activated before opening the metering sliders.	Correct software operation • Start spreading discs • Open metering slides
32	Externally controlled parts can be moved.Risk of injury through squeezing and shearing! - Direct ALL persons out of the danger zone - Read the instruction manual Confirm with ENTER	If the machine control unit is activated, components may move unexpectedly. • Follow the displayed instructions only if all risks have been eliminated.
33	Stop the discs and close the metering sliders	You may only switch to the System / Test menu area if the spreading operation has been deactivated. • Stop spreading discs. • Close the metering slide.
46	Spreading speed error. Observe spreading speed of 450..650 rpm!	The PTO speed lies outside the range.
47	Left dosing error, hopper empty, outflow blocked!	• Hopper empty • Outlet blocked
48	Right dosing error, hopper empty, outflow blocked!	• Hopper empty • Outlet blocked
71	Impossible to reach disc speed	The spreading disc speed is not within the 5 % target range. • Problem with oil supply • Proportional valve spring is jammed.

No.	Message in display	Meaning and possible cause
82	Type of machine modified. Spreading error possible. New configuration required!	The operating modes cannot be combined with certain machine types ▶ Restart the machine control unit after a change of type of machine. ▶ Implement machine settings. ▶ Load fertilizer chart for the machine type.
88	Error at disc speed sensor	The spreading disc RPM could not be determined • Cable breakage • Defective sensor
89	Disc speed too high	Alarm of the spreading disc sensor • The maximum RPM is reached. • The set RPM exceeds the maximum admissible value.

6.2 Fault/alarm

An alarm message is displayed with a red frame and with a warning symbol.

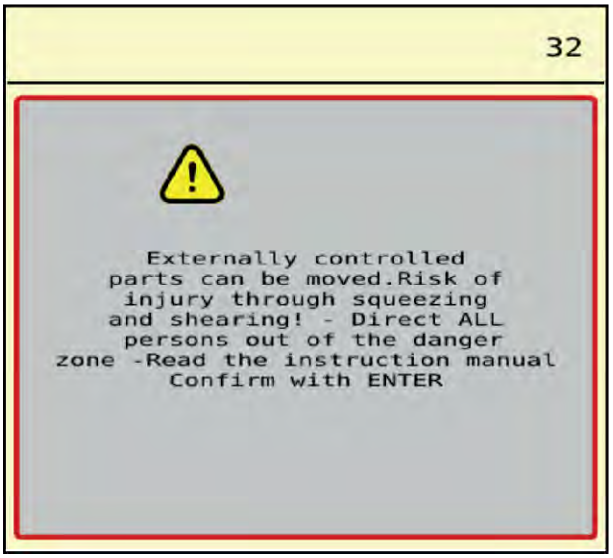


Fig. 35: Alarm message (example)

6.2.1 Acknowledging an alarm message

Acknowledging an alarm message:

- ▶ Rectify the cause of the alarm message.

  Refer to the operator's manual for your mineral fertilizer spreader.
  See also *6.1 Meaning of the alarm messages*.
- ▶ Acknowledge the alarm message by selecting the green check icon.
- ▶ Use various keys to acknowledge the other messages with a yellow frame:
  - ▷ Enter
  - ▷ Start/Stop
- ▶ Follow the instructions on the screen.

The acknowledgment of alarm messages may differ on different ISOBUS terminals.

7 Special equipment

Illustration	Designation
	CCI A3 joystick

8 Guarantee and warranty

RAUCH devices are manufactured using modern production methods and with the greatest of professional care, and are subjected to numerous inspections.

This is why RAUCH is offering a 12 month warranty if the following conditions are met:

- The warranty starts on the date of purchase.
- The warranty covers material or manufacturing defects. We are liable for third-party products (hydraulics, electronics) only to the extent of the relevant manufacturer During the warranty period, manufacturing and material defects will be rectified free of charge with the replacement or repair of the affected parts. Other rights extending beyond the above, such as claims for conversion, reduction, or replacement for reasons of damage not suffered by the supplied product are explicitly excluded. Warranty services are provided by authorized workshops, by RAUCH factory representatives or the factory itself.
- Consequences of natural wear, dirt, corrosion, and all defects caused by improper use as well as external influences shall be excluded from the warranty. Any unauthorized repairs or changes to the original condition will void the warranty. The warranty is voided if any spare parts other than genuine RAUCH spare parts were used. Therefore, the directions in the operating manual must be observed. Please contact our company representatives of the parent company if you have any questions or doubts. Warranty claims must be submitted to the company within 30 days at the latest after the damage has occurred. The date of purchase and the machine number must be indicated. If repairs under the warranty are required, they must be carried out by the authorized workshop only after consultation with RAUCH or the company's appointed representatives. The warranty period will not be extended by warranty work. Transport damage is not a factory defect and is therefore not covered by the manufacturer's warranty manufacturer.
- Claims for damage other than to the RAUCH devices will not be accepted. This also means that no liability will be accepted for damage resulting from spreading errors. Unauthorized modifications of the RAUCH devices may result in consequential damage, for which the manufacturer will not accept any liability. The manufacturer's exclusion from liability will not apply in the case of willful intent or gross negligence by the owner or a senior employee, and in cases where – according to the product liability law – there is liability for personal injury or material damage to privately used objects in the event of defects in the supplied product. The exclusion from liability will also not apply if characteristics are missing that are explicitly guaranteed, if the purpose of their guarantee was to protect the purchaser against damage not suffered by the supplied product itself.

RAUCH Streutabellen
RAUCH Fertilizer Chart
Tableaux d'épandage RAUCH
Tabele wysiewu RAUCH
RAUCH Strooitabellen
RAUCH Tabella di spargimento
RAUCH Spredetabellen
RAUCH Levitystaulukot
RAUCH Spridningstabellen
RAUCH Tablas de abonado

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