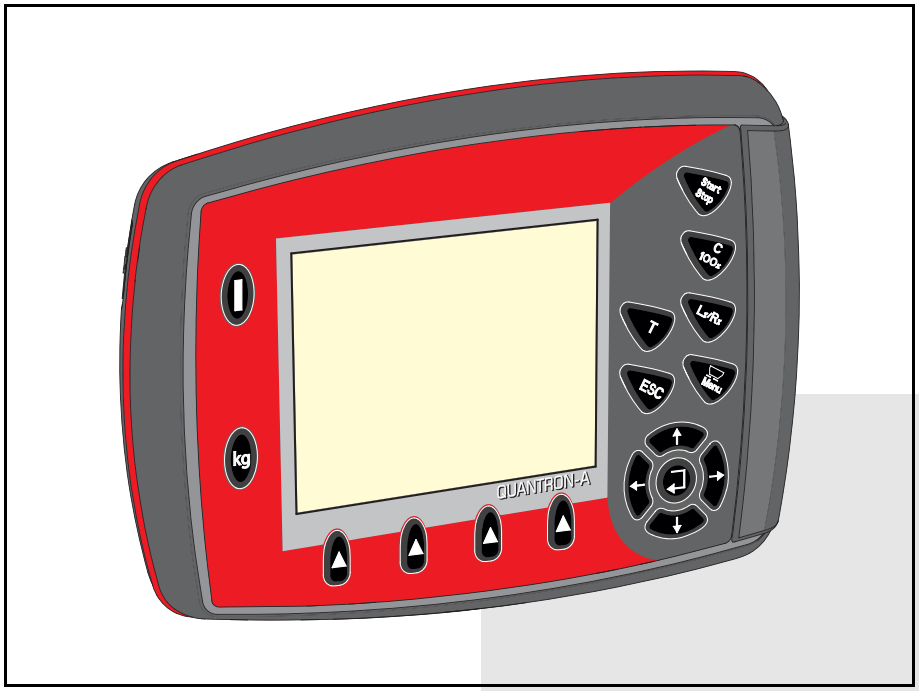
RAUCH
wir nehmen's genau

INSTRUCTION MANUAL



Please read carefully before using the machine.

Keep for future reference.

This instruction manual/assembly instruction is to be considered as part of the machine. Suppliers of new and second-hand machines are required to document in writing that the instruction manual/assembly instruction was delivered with the machine and handed over to the customer.

QUANTRON-A M EMC

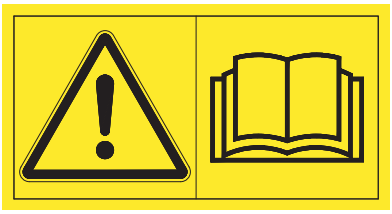
Original instructions

5901629-a-en-1215

Preface

Dear Customer,

By purchasing the QUANTRON-A control unit for the AXIS-M EMC mineral fertiliser spreader you have shown confidence in our product. Thank you very much! We want to justify this confidence. You have purchased a reliable, high-performance control unit. In case unexpected problems arise, Our customer service is always there for you.



Please read this operating manual as well as the operating manual of the machine carefully before commissioning and follow the advice given.

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

Please note that damage caused by incorrect operation or improper use may not be covered by warranty claims.

NOTICE

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

The QUANTRON-A control unit has been calibrated at the factory for the mineral fertiliser spreader with which it was supplied. It cannot be connected to another machine without requiring calibration.

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

Control unit serial number:	Mineral fertiliser spreader serial number:	Year of manufacture:

Technical improvements

We are continuously improving our products. Therefore, we reserve the right to make any improvements and changes to our machine that we consider necessary without notice. This constitutes no 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

1 User instructions

1.1 About this operating manual

This operating manual is an **integral part** of the control unit **QUANTRON-A**.

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

The operating manual is an integral part of the machine. The entire documentation must be kept in an easily accessible location close to where the control unit is used (e.g. on the tractor).

The operating manual does not replace your **own responsibility** as the operator and operating personnel of the control unit QUANTRON-A.

1.2 Notes on the depiction of information in this manual

1.2.1 Significance of warnings

The warning instructions in this manual have been structured according to the degree of danger and the probability of their occurrence.

Danger signs and symbols inform the user about other construction-related and unavoidable residual risks that may be encountered when operating the machine. The warning notes used are structured as follows:

	Signal word
Symbol	Explanation

Example

⚠ DANGER

Risk to life if warning is not observed

Description of the danger and possible consequences.

Ignoring these warnings will result in very serious or even fatal injury.

▶ Measures to prevent the danger.

Warning severity level

The degree of danger is indicated by the signal word. The levels 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 persons.

Ignoring these warnings will result in very serious or even fatal injury.

▶ Always observe the measures described to prevent this danger.

⚠ WARNING

Type and source of danger

This warning warns of a possible dangerous situation for the health of persons.

Ignoring these warnings will result in very serious 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 or of material and environmental damage.

Ignoring this warning can result in injuries and damage to the product or the general area.

▶ Always observe the measures described to prevent this danger.

NOTICE

General information containing application tips and particularly useful information, but which constitutes neither warnings nor hazards.

1.2.2 Instructions and procedures

Steps that the operator must carry out are shown as a numbered list.

1. Instruction for action step 1
2. Instruction for action step 2

Instructions involving only one step are not numbered. The same applies for action steps that do not have a specific sequence.

A bullet is placed in front of these instructions:

- Handling instruction

1.2.3 Listings

Listings without a specific sequence are shown with bullet points (level 1) and dashes (level 2):

- Property A
  - Point A
  - Point B
- Property B

1.2.4 References

References to other text passages in the document are indicated with section number, headline text and page number:

- **Example**: See also chapter 3: Safety, page 5.

References to other documents are indicated as note or instruction without exact chapter or page number:

- **Example**: Please also observe the instructions contained in the manual for the universal drive shaft.

1.2.5 Menu hierarchy, keys and navigation

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

In the menus, **submenus and/or menu items** are listed where you can make settings (selection lists, text or number entries, starting functions).

The different menus and keys of the control unit are illustrated in **bold** letters:

- Access the highlighted submenu by pressing the **Enter key**.

Hierarchy and the path to the requested menu item are marked with **>** (arrow) between menu, menu item/s:

- **System / Test > Test/Diagnosis > Voltage** means that you can access the menu item **Voltage** via the **System / Test** menu and the **Test/Diagnosis** menu item.
  - The arrow **>** correpsonds to confirmation with the **Enter key**.

2 Layout and function

2.1 Overview of the supported mineral fertiliser spreaders

Function/options	AXIS-M 20 EMC	AXIS-M 20 EMC + W	AXIS-M 30 EMC + W AXIS-M 40 EMC + W
Mass flow control by measuring the torque of the spreading discs	●	●	●
Weigh cells		●	●

2.2 Layout of the control unit - overview

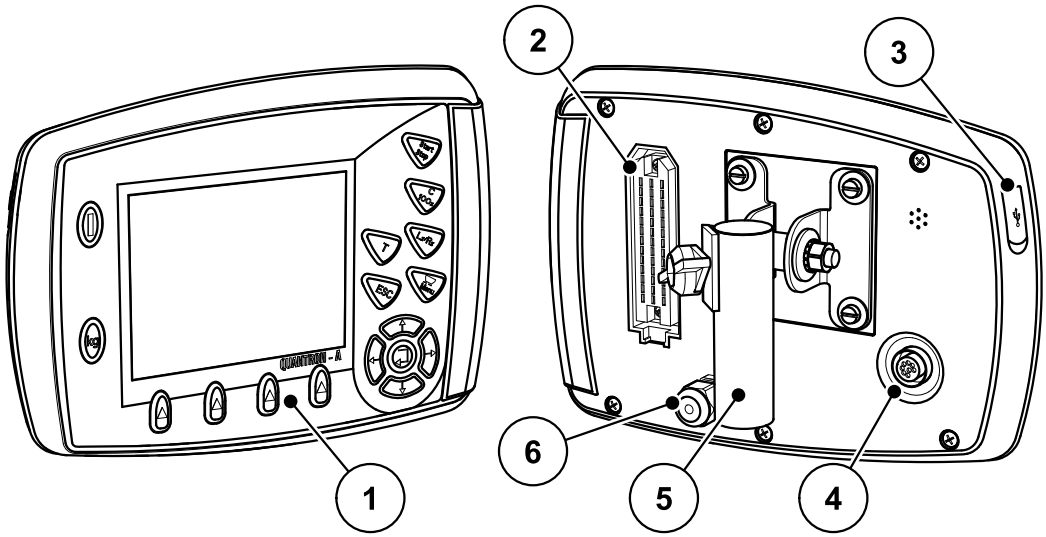


Figure 2.1: Control unit QUANTRON-A

No.	Designation	Function
1	Control panel	Consisting of foil buttons used to operate the device and the display for operating screens.
2	Machine cable plug connector	39-pin plug connector for connecting the machine cable to sensors and actuating cylinders.
3	USB port with cover	For exchanging data and updating the PC. Cover serves as a protection against contamination.
4	V24 data port	Serial interface (RS232) with LH 5000 and ASD protocol, designed for Y-RS232 cables for connection to a remote terminal. Plug connection (DIN9684-1/ISO11786) for connecting the 7-pin to the 8-pin cable for the speed sensor.
5	Mounting bracket	Attaches the control unit to the tractor.
6	Power supply	3-pin plug connector conforming to DIN 9680 / ISO 12369 for connecting the power supply.

2.3 Control elements

The QUANTRON-A unit is operated by means of **17 foil buttons** (13 fixed and 4 freely configurable foil buttons).

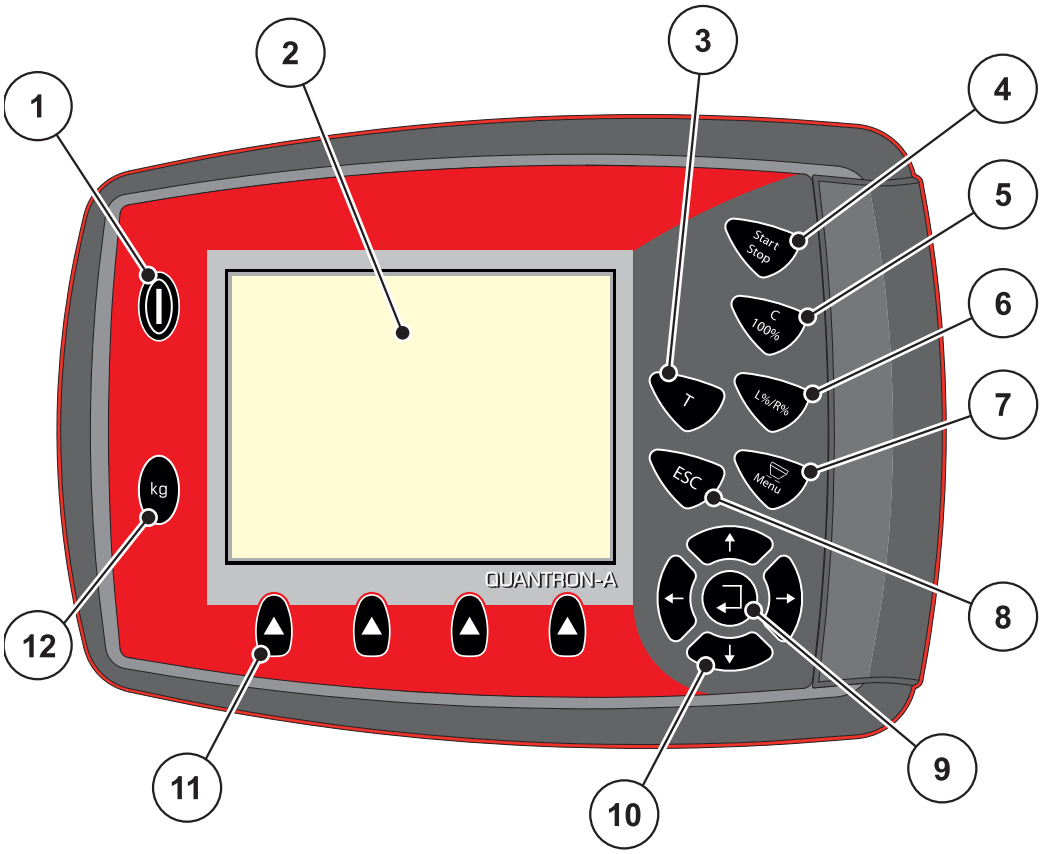


Figure 2.2: Operating panel at the front of the unit

NOTICE

The operating manual describes the functions of the control unit QUANTRON-A **as of software version 2.00.00**

No.	Designation	Function
1	ON/OFF	Switches the device on/off
2	Display	Display of operating screens
3	T key (TELIMAT)	• Key to display the TELIMAT settings, • page 82
4	Start/Stop	Start/stop spreading.
5	Clear/Reset	• Clear an input in an input field, • Resetting the excess quantity to 100%; • Acknowledging alarm messages.

No.	Designation	Function
6	Preselected section setting	Toggle key for alternating between 4 states. ● Pre-selection of sections for changing the quantity. page 56 - **L: L**eft - **R: R**ight or - **L+R: L**eft **+ R**ight ● Section management (VariSpread function) page 11
7	Menu	Switch between operating screen and main menu. See page 30.
8	ESC	For aborting information input and/or returning to the previous menu at the same time.
9	Navigation field	**Enter key** ● To confirm an input. ● Manual start of an empty run measurement
10		4 **arrow keys** for navigating through the menus and input fields. ● Moving the cursor on the display ● Marking a menu or input field
11	Function keys F1 to F4	Selection of the functions displayed above the function keys.
12	Weighing-Trip counter	● Trip counter, see page 27 ● Display of the remaining quantity. ● Meter counter ● Machine tare, see page 29

2.4 Display

The display shows the current status information and the selection and input options for the control unit.

The main information on the operation of the machine is provided on the **operating screen**.

2.4.1 Description of the operating screen

NOTICE

The exact representation of the operating screen depends on the actual settings selected. Refer to chapter 4.9.2: Display configuration, page 68.

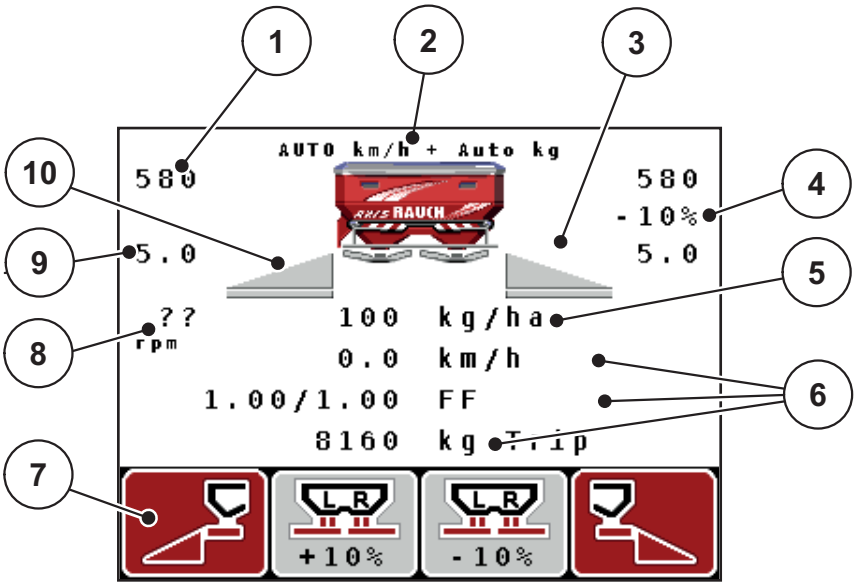


Figure 2.3: Control unit display

The icons and displays in the example have the following meaning:

No.	Icon / display	Meaning (in the example shown)
1	Metering slide scale opening left	Current opening position of the left metering slide.
2	Operating mode	Indicates the current operating mode. ● AUTO km/h + AUTO kg is the operating mode used for the **M EMC** function.
3	TELIMAT icon	This icon appears if the **TELIMAT sensors** are installed and the **TELIMAT function** is enabled (factory setting) or the **T key** is activated.
4	Quantity change right	Quantity change (**+/-**) in percent. ● Display of quantity changes. ● Range of values +/- **1...99%** possible.
5	Application rate	**Preset** application rate.
6	Display fields	Individually configurable display fields (here: Forward speed, spread quantity, flow factor left/right) ● Possible configuration: see chapter 4.9.2: Display configuration, page 68.
7	Icon fields	Icon assignment to the fields **depending on the menu**. ● Selection of the function by means of the **function keys** below.
8	PTO speed	Current PTO speed ● See 4.5.8: PTO, page 40
9	Drop point	Current position of the drop point
10	Section left	Display of status of left section. See figure 2.4.

2.4.2 Display of the metering slide status

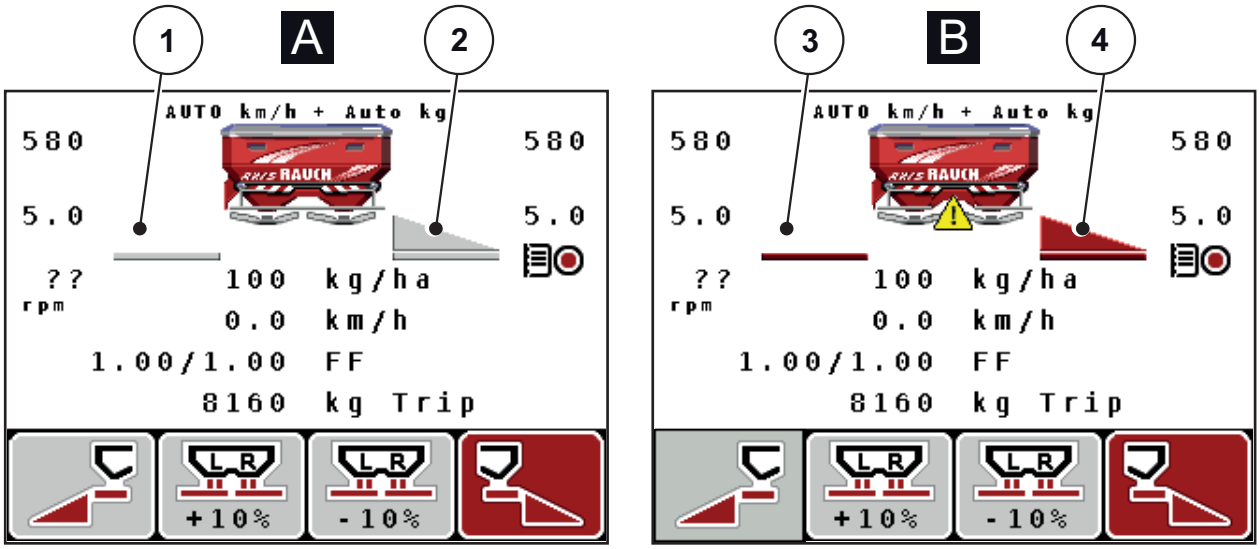


Figure 2.4: Display of the metering slide states

[A] Spreading operation inactive (STOP)
[1] Section deactivated
[2] Section activated
[B] Machine in spreading mode (START)
[3] Section deactivated
[4] Section activated

2.4.3 Display of sections

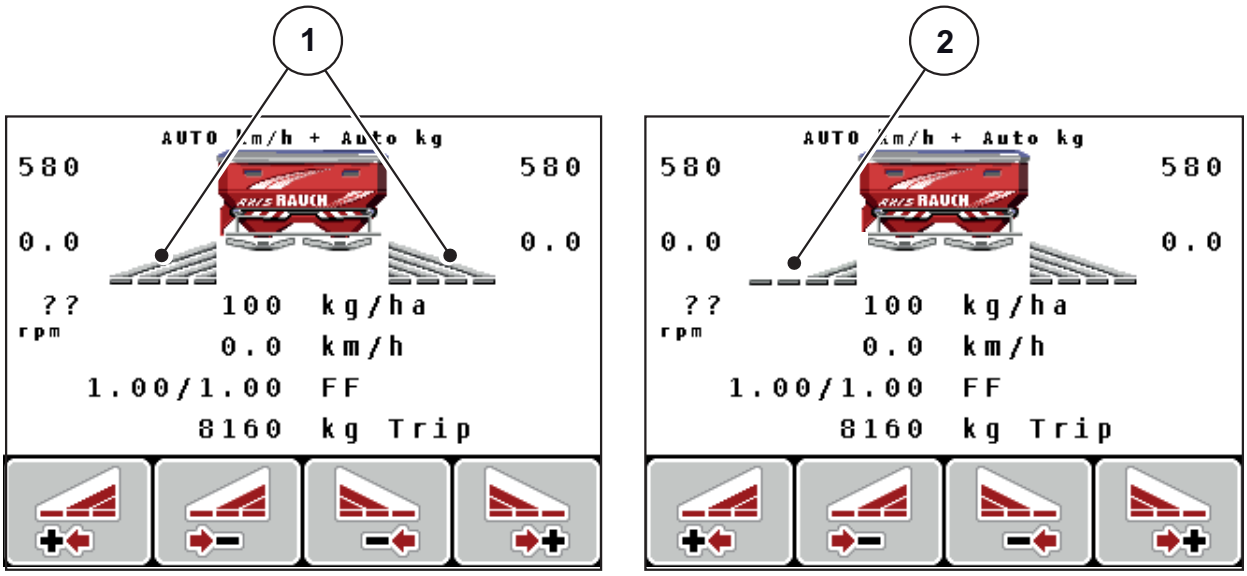


Figure 2.5: Display of the section status (example with VariSpread 8)

[1] Activated sections with 4 possible spreading width steps
[2] The leftsection is reduced by 2 section steps

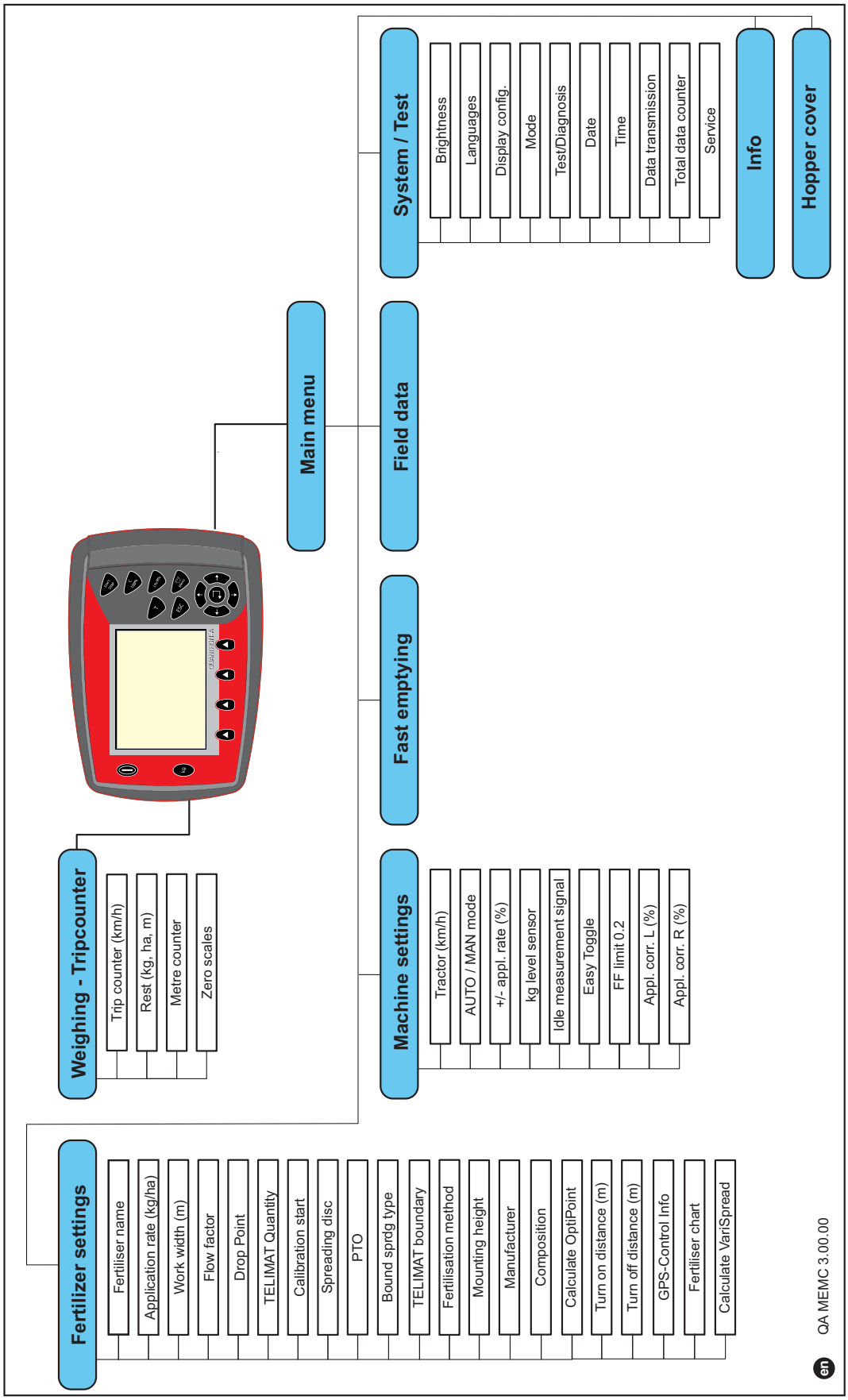
2.5 Library of symbols used

The screen of the QUANTRON-A control unit displays symbols for menus and functions.

Symbol	Meaning
	Quantity adjustment + (plus)
	Quantity adjustment - (minus)
	Quantity adjustment, left + (plus)
	Quantity adjustment, left - (minus)
	Quantity adjustment, right + (plus)
	Quantity adjustment, right - (minus)
	Manual change of the metering slide position + (plus)
	Manual change of the metering slide position - (minus)
	Left spreading side active
	Left spreading side inactive
	Right spreading side active
	Right spreading side inactive

Symbol	Meaning
	Reduce section, right (minus)
	Increase right section (plus)
	Reduce section, left (minus)
	Increase left section (plus)

2.6 Structural menu overview



3 Attachment and installation

3.1 Requirements for the tractor

Before installing the control unit, check to make sure your tractor meets the following requirements:

- A minimum voltage of **11 V** is essential **at all times,** even if multiple loads are connected simultaneously (e. g. air conditioning system, lights).
- The PTO speed can be set to **540 rpm** and must be maintained (basic requirement for correct working width).

NOTICE

On tractors without load-switchable gears, 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.

- A 7-pin socket (DIN 9684-1/ISO 11786). The control unit receives the pulse for the current forward speed through this socket.

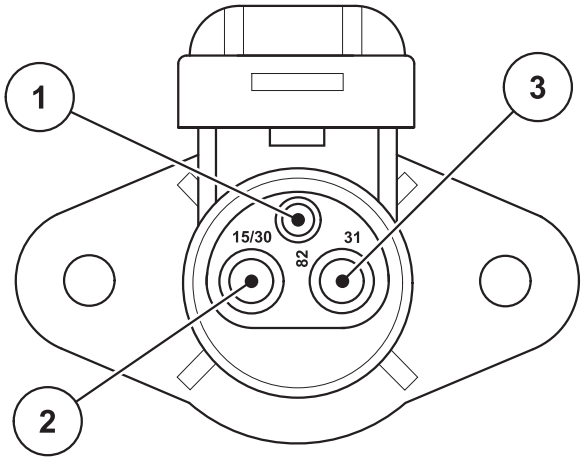
NOTICE

The 7-pin socket for the tractor and the forward speed sensor can be obtained as an expansion kit (option), see chapter Special Equipment.

3.2 Connections, sockets

3.2.1 Power supply

The control unit is supplied with power from the tractor via the 3-pin power supply socket (DIN 9680/ISO 12369).

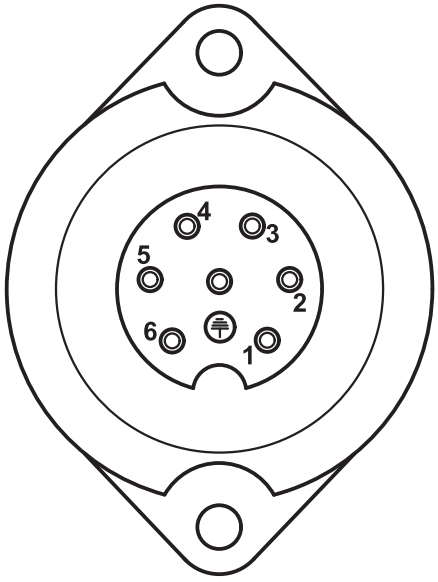


[1] PIN 1: not required
[2] PIN 2: (15/30): +12 V
[3] PIN 3: (31): mass

Figure 3.1: PIN assignment of power socket

3.2.2 7-pin plug connector

The control unit receives the pulses for the current forward speed via the 7-pin plug connector 9684-1/ISO 11786). For this purpose, the 7-pin to 8-pin cable (accessory) is connected to the forward speed sensor at the plug connector.



[1] PIN 1: actual forward speed (radar)
[2] PIN 2: theoretical forward speed (e. g. gearbox, wheel sensor)

Figure 3.2: PIN assignment for 7-pin plug connector

3.3 Connecting the control unit

NOTICE

After having switched on the QUANTRON-A control unit, the display shows the machine number for a short time.

NOTICE

Note the machine number

The control unit QUANTRON-A has been calibrated at the factory for the mineral fertiliser spreader with which it was supplied.

Only connect the control unit to the correct mineral fertiliser spreader.

Depending on the equipment, there are different methods of attaching the control unit to the machine. Schematic connection diagrams:

- for the standard connection, see Page 18,
- for the connection with the wheel sensor, see Page 19,
- for the connection with the wheel sensor and machine cable, see Page 20.

Proceed in the following order.

- Select a suitable position in the tractor cabin (within **the driver's field of vision**) to fix the control unit.
- Fix the control unit by means of **brackets** in the tractor cabin.
- Connect the control unit to the 7-pin socket or to the forward speed sensor (depending on the equipment, see Figure 3.3 to Figure 3.5).
- Connect the control unit to the actuators of the machine using the 39-pin machine cable.
- Connect the control unit to the tractor's power supply using the 3-pin plug connector.

Standard schematic connection diagram:

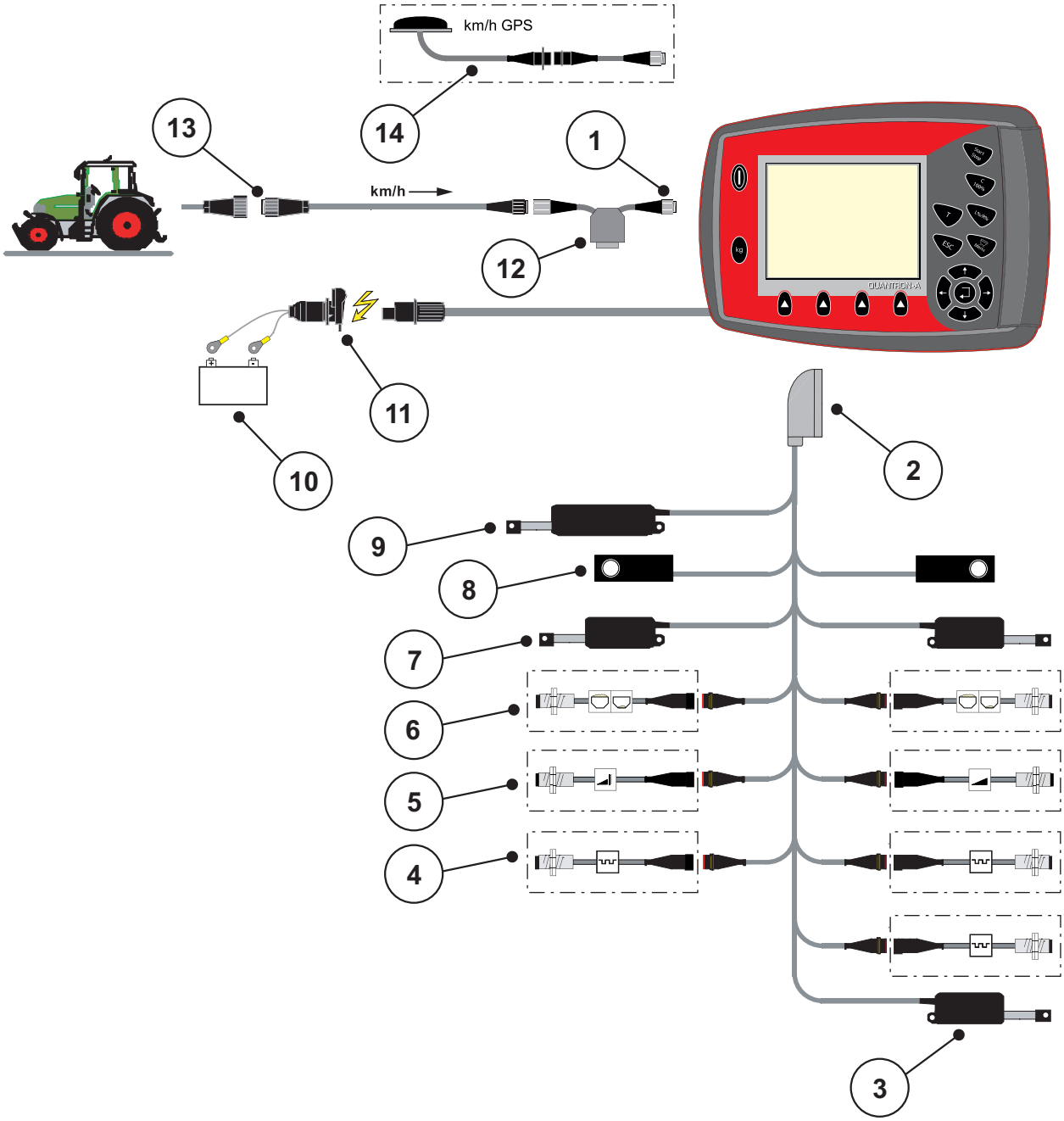


Figure 3.3: Schematic connection diagram QUANTRON-A

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine plug
[3] Option: Drop point adjustment (machines with VariSpread)
[4] M EMC sensors (left, right, centre)
[5] Option: TELIMAT sensor top/bottom
[6] Option: Fill level sensor left/right
[7] Metering slide actuator left/right
[8] Weigh cell left/right
[9] Optional: electrical TELIMAT
[10] Battery
[11] 3-pin plug connector conforming to DIN 9680 / ISO 12369
[12] Option: Y-cable (V24 RS232 interface for storage medium)
[13] 7-pin plug connector conforming to DIN 9684
[14] Option: GPS cable and receiver

Schematic connection diagram for wheel sensor:

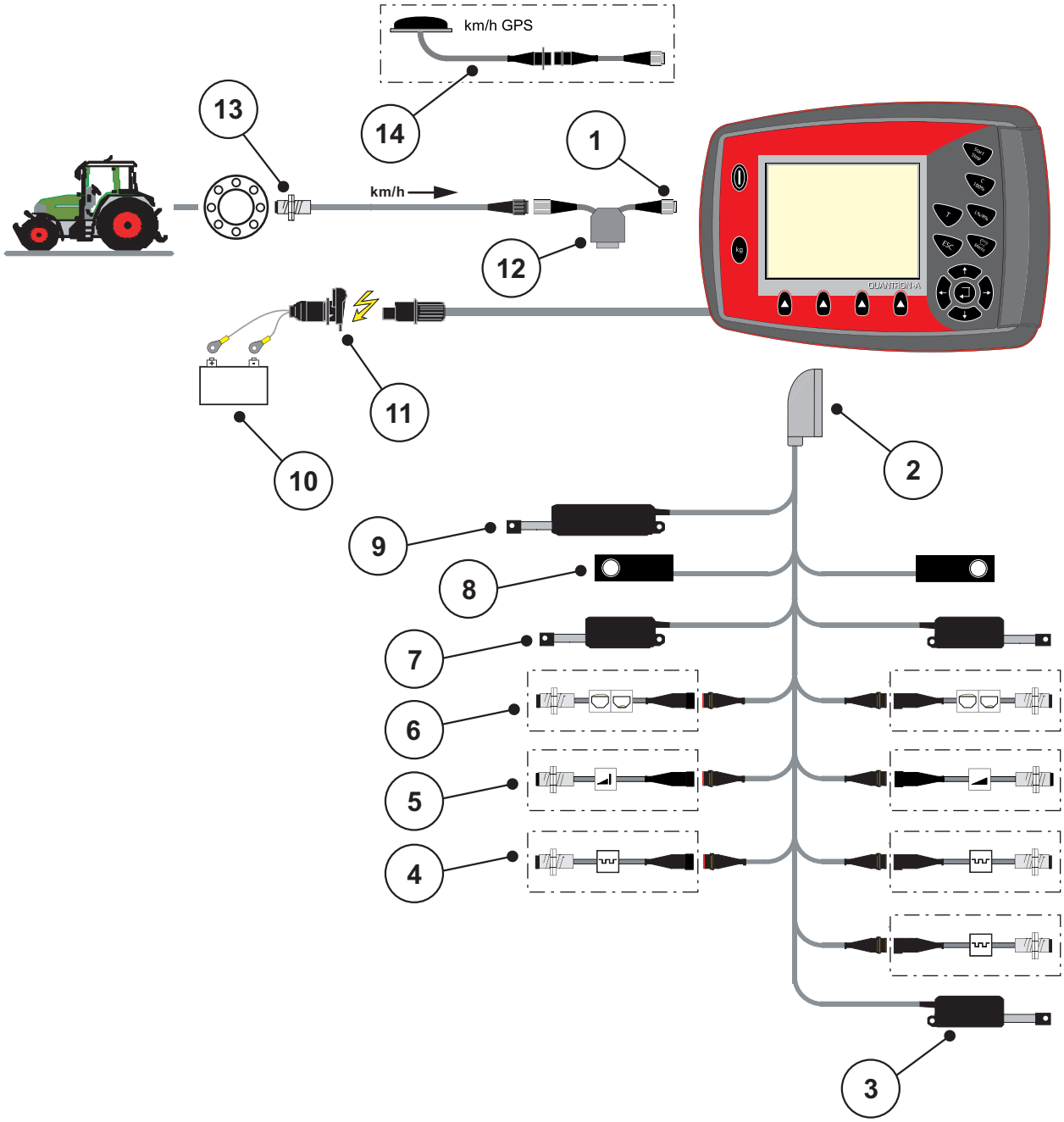


Figure 3.4: Schematic connection diagram QUANTRON-A

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine plug
[3] Option: Drop point adjustment (machines with VariSpread)
[4] M EMC sensors (left, right, centre)
[5] Option: TELIMAT sensor top/bottom
[6] Option: Fill level sensor left/right
[7] Metering slide actuator left/right
[8] Weigh cell left/right
[9] Optional: electrical TELIMAT
[10] Battery
[11] 3-pin plug connector conforming to DIN 9680 / ISO 12369
[12] Option: Y-cable (V24 RS232 interface for storage medium)
[13] Forward speed sensor
[14] Option: GPS cable and receiver

Schematic connection diagram: Power supply via ignition lock

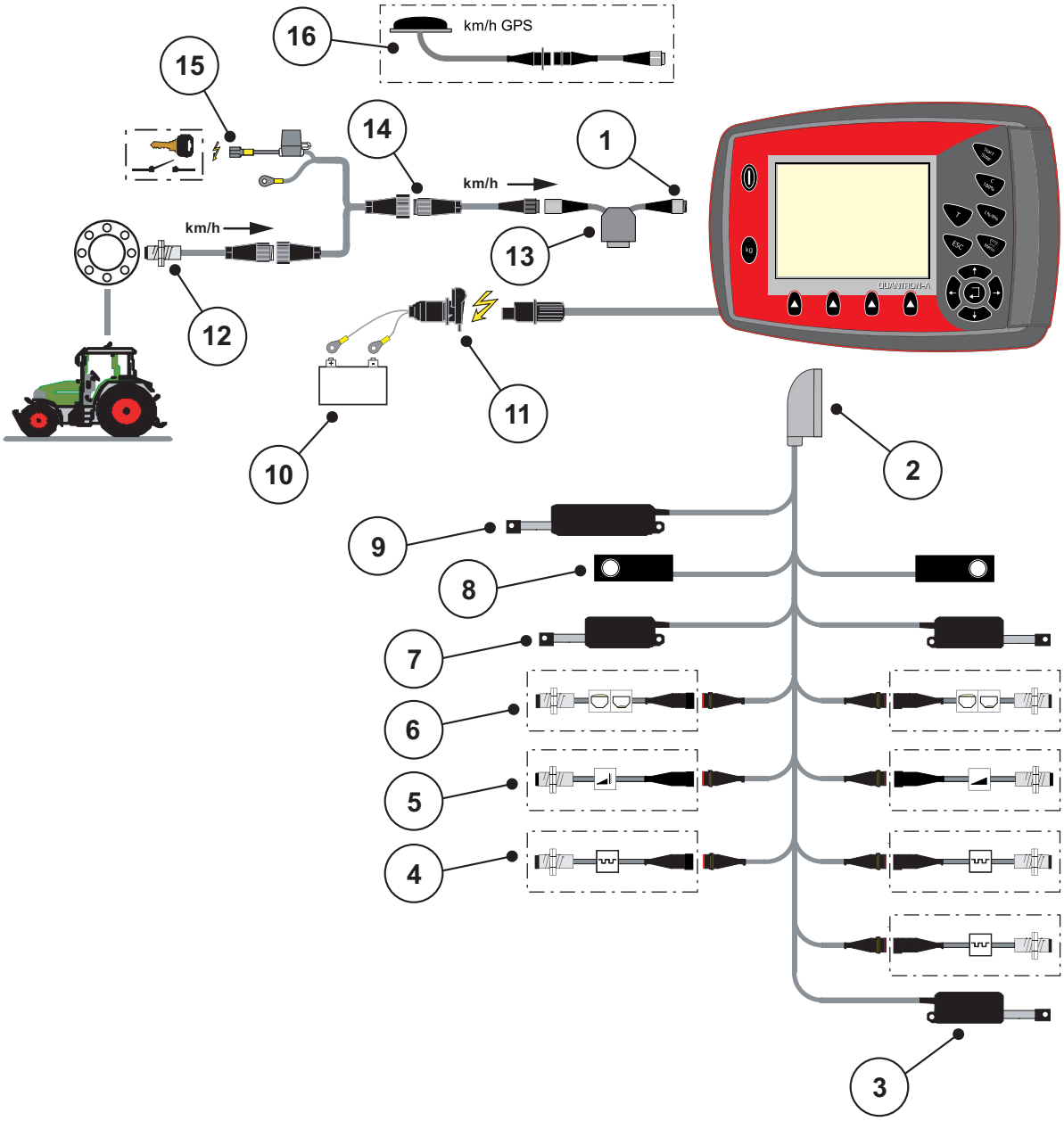


Figure 3.5: Schematic connection diagram QUANTRON-A

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine plug
[3] Option: Drop point adjustment (machines with VariSpread)
[4] M EMC sensors (left, right, centre)
[5] Option: TELIMAT sensor top/bottom
[6] Option: Fill level sensor left/right
[7] Metering slide actuator left/right
[8] Weigh cell left/right
[9] Optional: electrical TELIMAT
[10] Battery
[11] 3-pin plug connector conforming to DIN 9680 / ISO 12369
[12] Forward speed sensor
[13] Option: Y-cable (V24 RS232 interface for storage medium)
[14] Option: QUANTRON-A power supply via ignition lock
[15] 7-pin plug connector conforming to DIN 9684
[16] Option: GPS cable and receiver

3.4 Metering slide preparation

The machines AXIS-M 30.1 EMC + W are provided with an electric slide actuation for adjusting the application rate.

⚠ CAUTION

Damage to property caused by incorrect positioning of the metering slide

Operation of the actuators by the QUANTRON-A can cause damage to the metering slides if the stop levers are incorrectly positioned.

▶ Always clamp the stop levers at the **maximum** scale position.

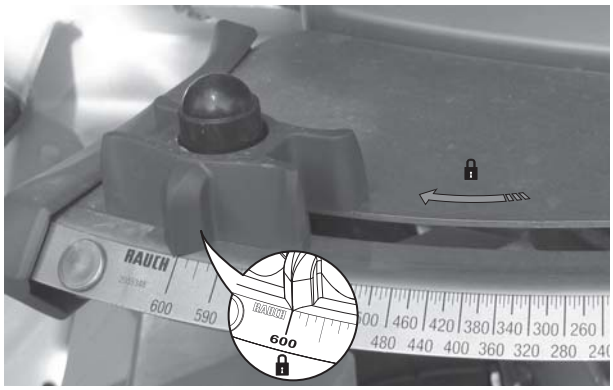


Figure 3.6: Metering slide preparation (example)

NOTICE

Observe the operating manual of your tractor.

4 Operation QUANTRON-A

⚠ CAUTION

Risk of injury due to ejected fertiliser!

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 discharged fertiliser.

▶ **Before leaving for the place of spreading** the electronic control unit QUANTRON-A must always be switched off.

NOTICE

The settings of each menu are very important for optimal **automatic mass flow control (M EMC function)**.

The following menu items must be observed in particular:

- In the **Fertiliser settings** menu
  - Spreading disc type. See page 40.
  - PTO speed. See page 40.
- In the **Machine settings** menu
  - AUTO / MAN mode See page 53 and chapter 5.

4.1 Switching on the control unit

Requirements:

- The control unit is correctly connected to the machine and the tractor (for example, see chapter 3.3: Connecting the control unit, page 17).
- A minimum voltage of **11V** is guaranteed.

NOTICE

The operating manual describes the functions of the QUANTRON-A control unit **as of software version 2.20.00**.

Switching on:

1. Actuate the **ON/OFF switch [1]**.
   - ▷ After a few seconds, the **start-up screen** of the control unit appears.
   - ▷ Shortly after, the control unit will display the **activation menu** for a few seconds.
2. Press the **Enter key**.
   - ▷ The **start diagnosis** will be displayed for a few seconds.
   - ▷ Afterwards, the **operating screen** is displayed.

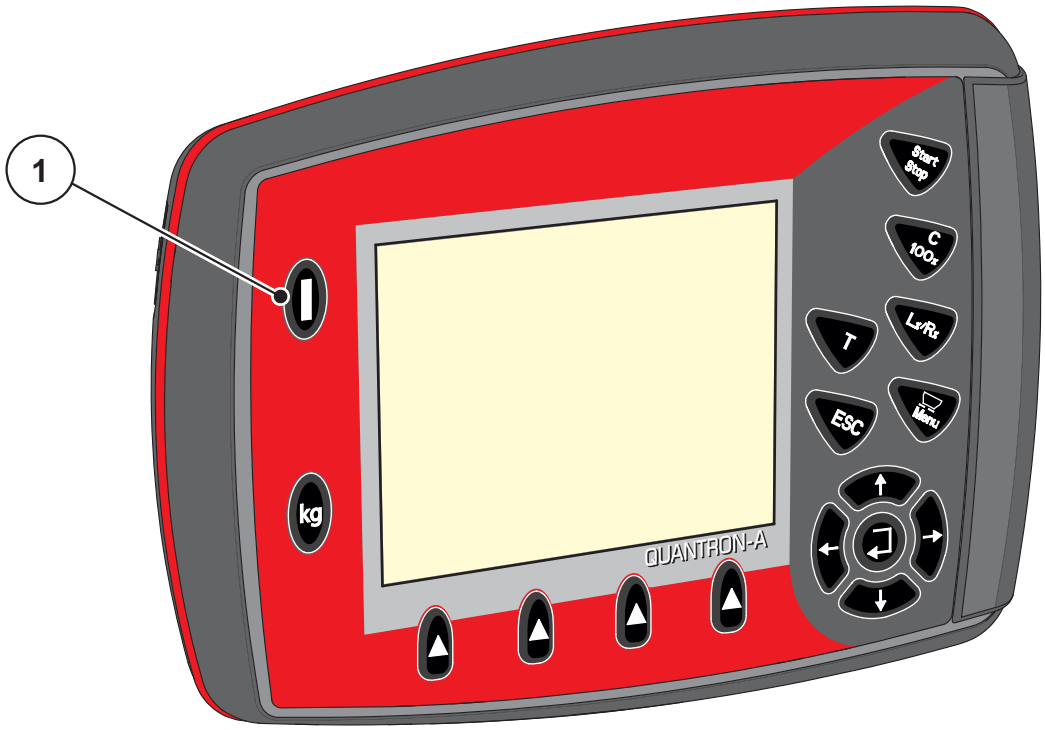


Figure 4.1: Start QUANTRON-A

[1] ON/OFF switch

4.2 Menu navigation

NOTICE

Important notes regarding the display and navigation between menus are provided in chapter 1.2.5: Menühierarchie, Tasten und Navigation, page 3.

Accessing the main menu

- Press the **Menu key**. See 2.3: Control elements, page 7.
  - ▷ The main menu is displayed.
  - ▷ The black bar indicates the first sub-menu.

NOTICE

Not all parameters are displayed simultaneously in one menu window. The **Arrow keys** enable switching to the next or previous windows.

Accessing a sub-menu:

1. Move the bar up and down with the **arrow keys**.
2. Select the desired sub-menu with the bar on the display.
3. Access the highlighted sub-menu by pressing the **Enter key**.

Windows appear prompting various actions.

- Text input
- Value input
- Settings made in further sub-menus

Exiting the menu

- Confirm settings by pressing the **Enter key**.
  - ▷ The **previous menu** is displayed.

  or
- press ESC key.
  - ▷ The previous settings are maintained.
  - ▷ The **previous menu** is displayed.
- Press the **Menu key**.
  - ▷ The **operating screen** is displayed again.
  - ▷ Press the **Menu key** once more to return to the menu that you left.

4.3 Weighing trip counter

This menu provides values regarding spreading work carried out and functions for weighing operation.

- Press the **kg** key at the control unit.
  ▷ The **weighing trip counter** menu is displayed.

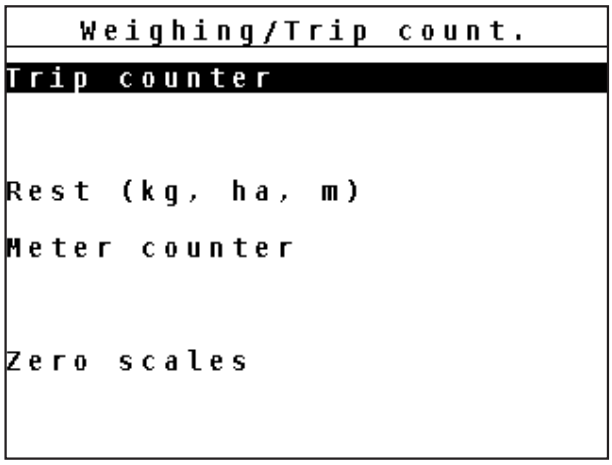


Figure 4.2: Weighing trip counter menu

Sub-menu	Meaning	Description
Trip counter	Display of the applied spreading quantity, area spread and spread distance.	page 27
Rest (kg, ha, m)	Display of the residual spread quantity, area and distance.	page 28
Metre counter	Display of the distance travelled since the last reset of the metre counter.	Reset (zeroing) by pressing the **C 100 % key**
Tare the scales	Weighing value for empty scales is set to "0 kg".	page 29

4.3.1 Trip counter

This menu provides the following values:

- kg spread
- spread area (ha)
- spread distance (m)

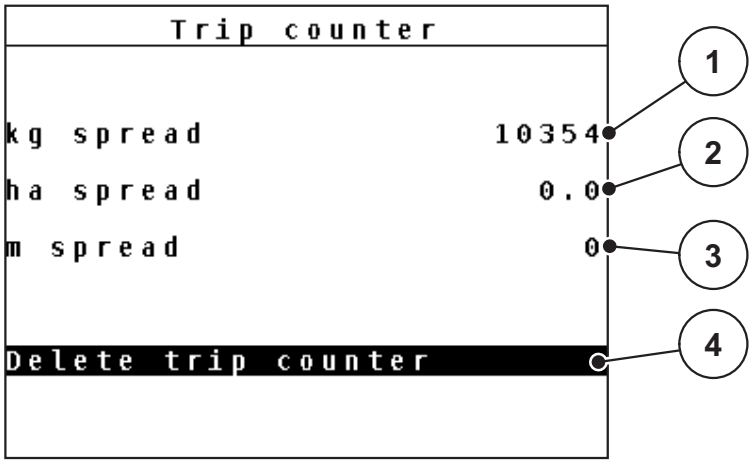


Figure 4.3: Trip counter menu

[1] Display of spread quantity since the last reset
[2] Display of spread area since the last reset
[3] Display of spread distance since the last reset
[4] Clearing the trip counter: all values to 0

Deleting the trip counter:

1. Open the **Weighing trip counter > Trip-counter** sub-menu.
   ▷ The calculated values for spread quantity, area and distance **since the last deletion** are displayed.
   ▷ The **Delete trip counter** field is highlighted.
2. Press the **Enter key**.
   ▷ All values of the trip counter are reset to 0.
3. Press the **kg key**.
   ▷ The operating screen is displayed again.

Checking the trip counter during spreading:

During the spreading work, i.e. with the metering slides being open, change into the **Trip counter** menu and obtain the current values there.

NOTICE

If the values are to be permanently monitored during spreading, freely assignable display fields in the working screen may also be assigned the **kg Trip**, **ha Trip** or **m Trip** values, refer to chapter 4.9.2: Display configuration, page 68.

4.3.2 Displaying the remaining quantity

In the **Rest (kg, ha, m)** menu, you can query or input the **residual quantity** in the hopper.

The menu shows the possible **area (ha)** and **distance (m)** which can still be spread with the remaining fertiliser quantity. Both displays are calculated based on the following values:

- Fertiliser settings,
- Input in the **remaining quantity** input field (not for weighing spreaders),
- application rate,
- working width.

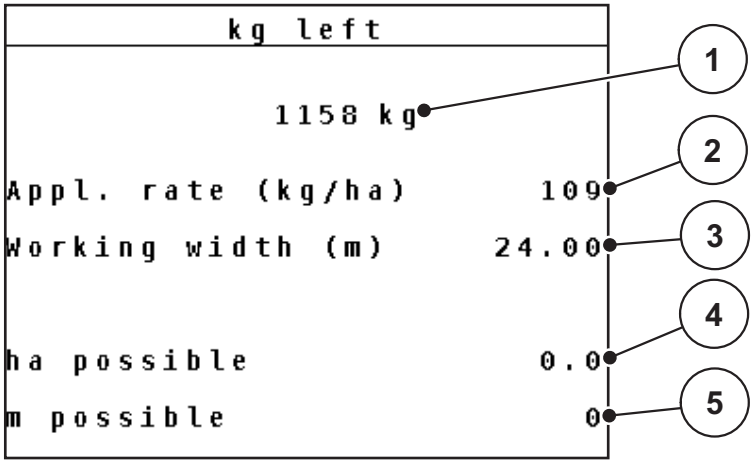


Figure 4.4: Rest (kg, ha, m) menu

[1] Remaining quantity input field
[2] Application rate (display field from fertiliser settings)
[3] Working width (display field from fertiliser settings)
[4] Display of the possible area that can be spread with the remaining quantity
[5] Display of possible distance that can be spread with the residual quantity

Entering the remaining quantity when refilling:

1. Open the **Weighing trip counter > Rest (kg, ha, m)** menu.
   ▷ The remaining quantity from the last spreading process is displayed.
2. Fill the hopper.
3. Enter the new total weight of the fertiliser in the hopper.
   See also chapter 4.12.2: Entering values with the cursor keys, page 79.
4. Press the **Enter key**.
   ▷ The device calculates the values for the possible spread area and the possible spread distance.

NOTICE

The application rate and working width values **cannot** be changed in this menu. **These values are for information only.**

5. Press the **kg** key.

▷ **The operating screen is displayed again.**

Calling up the residual quantity during spreading:

During spreading, the remaining quantity is continuously recalculated and displayed. See chapter 5: Spreading operation with the QUANTRON-A control unit, page 81.

4.3.3 Tare scales (AXIS-M 30.1 EMC + W only)

In this menu, the weighing value for the empty hopper is to be set 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 shaft is switched off,
- the machine is in a horizontal position and off the ground,
- the tractor is at a standstill.

Taring the scales:

1. Open the **Weighing trip counter > Tare the scales** menu.
2. Press the **Enter key**.

▷ **The weighing value for the empty scale is now set to 0 kg.**

▷ **The Weighing trip counter menu is displayed.**

NOTICE

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

4.4 Main menu

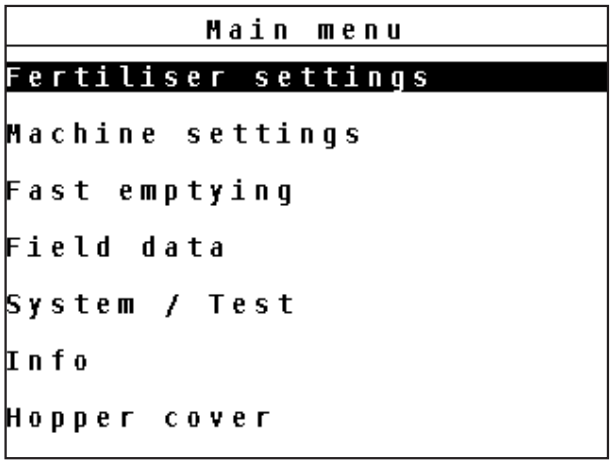


Figure 4.5: Main menu QUANTRON-A

The main menu shows the following submenus.

Sub-menu	Meaning	Description
Fertiliser settings	Fertiliser and spreading operation settings.	page 31
Machine settings	Settings for tractor and machine.	page 48
Fast emptying	Direct access to the menu for fast emptying of the machine.	page 58
Field data	Opens the menus for selecting, creating or deleting field data.	page 60
System/Test	Settings and diagnosis of the control unit.	page 65
Information	Display of machine configuration.	page 74
Hopper cover	Opening/closing the hopper cover	page 75

4.5 Fertiliser settings

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

NOTICE

- The entries in the **Disc type** menu item must comply with the actual settings of your machine.
- The entries in the **PTO** menu item must comply with the RPM selected for spreading operation.

- Open the **Main menu > Fertiliser settings** menu.

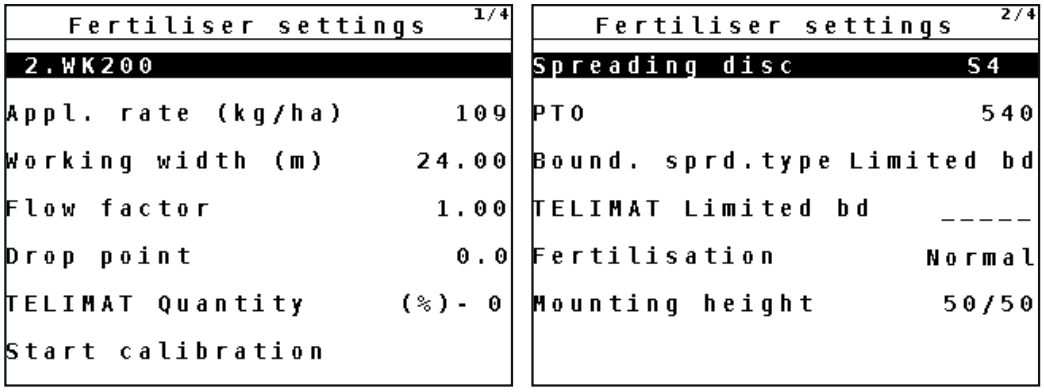


Figure 4.6: Fertiliser settings menu, page 1 and 2

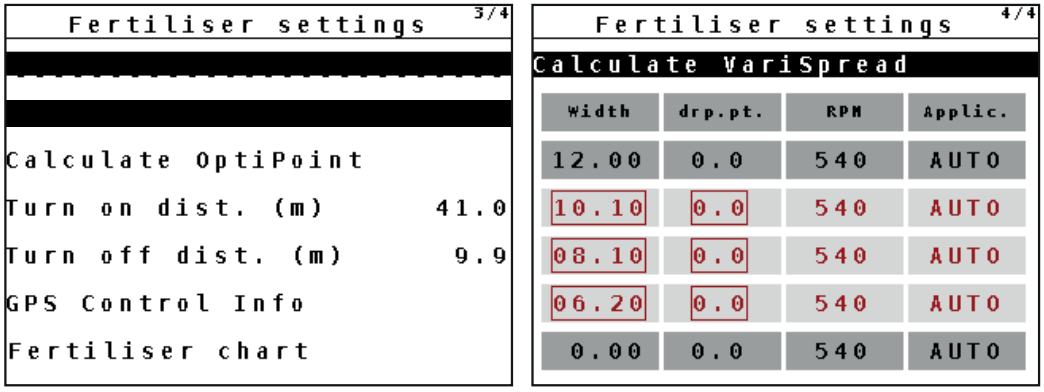


Figure 4.7: Fertiliser settings menu, page 3 and 4

NOTICE

Not all parameters are displayed simultaneously in one menu window. The **Arrow keys** enable switching to the next or previous windows.

Sub-menu	Meaning/possible values	Description
Fertiliser name	Fertiliser selected from the fertiliser chart.	page 44
Application rate (kg/ha)	Input of target value for the application rate in kg/ha.	page 33
Working width (m)	Determination of the working width to be spread.	page 34
Flow factor	Input of the flow factor of the fertiliser used.	page 36
Drop point	Input of the drop point. This display is only for information.	Please observe the operator's manual of the machine. page 36
TELIMAT quantity	Quantity reduction presetting for limited border spreading.	page 36
Start calibration	Accessing the sub-menu for calibration test.	page 37
Spreading disc	Selection list: ● S2 ● S4 ● S6 ● S8	Selection with **Arrow keys**. Confirm by pressing the **Enter key**.page 40
PTO	Factory setting: 540rpm	page 40
Boundary spreading type	Selection list: ● Boundary ● Border	Selection with **Arrow keys**. Confirm by pressing the **Enter key**.
TELIMAT bor-der/boundary	Saving the TELIMAT settings for bor-der spreading.	Only for ma-chines with TELIMAT.
Fertilisation method	Selection list: ● Normal ● Late	Selection with **Arrow keys**. Confirm by pressing the **Enter key**.
Mounting height	Input in cm Selection list: 0/6, 40/40, 50/50, 60/60, 70/70, 70/76	
Manufacturer	Fertiliser manufacturer input.	

Sub-menu	Meaning/possible values	Description
Composition	Percentage of the chemical composition.	
Calculation of Opti-Point	Input of the GPS control parameters	page 41
Switch-on distance (m)	Input of switch-on distance.	page 92
Switch-off distance (m)	Input of switch-off distance.	page 93
GPS control info	Display of information of the GPS control parameters.	page 43
Fertiliser chart	Management of fertiliser charts.	page 44
VariSpread calculation	Calculation of values for adjustable sections	page 46

4.5.1 Application rate

In this menu, you can enter the desired target value for the application rate.

Entering the application rate:

1. Open the **Fertiliser settings > Application rate (kg/ha)** menu.
   ▷ The **currently applied** application rate is displayed.
2. Enter the new value in the input field.
   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
3. Confirm the input by pressing the **Enter key**.

▷ **The new value is saved in the control unit.**

4.5.2 Working width

In this menu, the working width can be set (in m).

1. Open the **Fertiliser settings > Working width (m)** menu.
   ▷ The **currently applied** working width is displayed.
2. Enter the new value in the input field.
   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
3. Confirm the input by pressing the **Enter key**.

▷ **The new value is saved in the control unit.**

4.5.3 Flow factor

The flow factor lies within the range of **0.4** to **1.9**. The following applies under the same basic conditions (km/h/, working width, kg/ha):

- If the flow factor is **increased**, the application rate is **decreased**.
- If the flow factor is **decreased**, the application rate is **increased**.

An error message is displayed if the flow factor is outside the preset range. See 6: Alarm messages and possible causes, page 95. If you spread organic fertiliser or rice, you need to reduce the minimum factor to 0.2. Otherwise the error message will be displayed constantly.

- Activate the > FF limit 0.2 in the machine settings.
  - See 4.6: Machine settings, page 48.

If the flow factor is known from earlier calibrations or from the fertiliser chart, it can be entered **manually** in this menu.

NOTICE

Via the **Calibration** menu, you can determine and input the flow factor using QUANTRON-A. Refer to chapter 4.5.6: Calibration, page 37.

The **M EMC function** determines the flow factor specifically for each spreading side. Therefore, no manual input is required.

NOTICE

The flow factor calculation depends on the operating mode used. For further information about the flow factor, refer to chapter 4.6.2: AUTO/MAN mode, page 53.

Entering the flow factor:

1. Open the **Fertiliser settings > Flow factor** menu.
   ▷ The **currently applied** flow factor is displayed.
2. Enter the new value in the input field.
   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.

NOTICE

If the fertiliser is not listed in the fertiliser chart, a flow factor of **1.00** is to be entered.

In the **AUTO km/h** and **MAN km/h** operating modes, it is highly recommended to carry out a **calibration** in order to be able to accurately determine the flow factor for this fertiliser.

3. Press the **Enter key**.

▷ **The new value is saved in the control unit.**

NOTICE

It is recommended to have the flow factor displayed in the operating screen. Thus you can observe the mass flow control during spreading. Please refer to chapter 4.9.2: Display configuration, page 68 and chapter 4.6.2: AUTO/MAN mode, page 53.

Display of flow factor with M EMC function

Enter a value for the flow factor in the **flow factor** submenu as a standard. However, during spreading and with enabled **M EMC function**, the control unit controls the left and the right metering slide separately. Both values are shown on the operating screen.

When pressing the **Start/Stop** key, the display updates the indicated flow factor with a slight delay. Then, the display is updated in regular intervals.

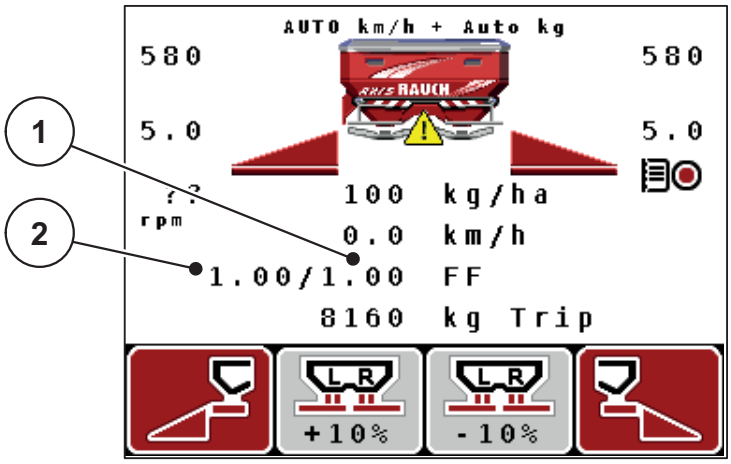


Figure 4.8: Left and right flow factor are controlled separately (enabled M EMC function).

[1] Flow factor for the right metering slide.
[2] Flow factor for the left metering slide.

4.5.4 Drop point

1. Open the **Fertiliser settings > Drop point** menu.
2. Determine the position for the drop point using the fertiliser chart.
3. Enter the determined value in the input field.

   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
4. Press the **Enter key**.

▷ **The Fertiliser settings window with the new drop point is displayed.**

If the drop point is blocked, alarm 17 is displayed. Refer to chapter 6: Alarm messages and possible causes, page 95.

⚠ CAUTION

Risk of injury due to automatic adjustment of the drop point!

With machines equipped with electrical drop point actuators, the **Move to drop point** alarm message appears. Upon activation of the **Start/Stop** key, the drop point is automatically moved to the preset value by means of the electrical actuating cylinders. This may cause injury and property damage.

▶ Before pressing **Start/Stop**, ensure that nobody is present in the danger zone of the machine.

4.5.5 TELIMAT rate

In this menu, the TELIMAT quantity reduction can be set (in percent). This setting is used for the activation of the boundary spreading function via the TELIMAT sensor or the **T key**.

NOTICE

It is recommended to reduce the application rate at the boundary by 20 %.

Entering the TELIMAT rate:

1. Open the **Fertiliser settings > TELIMAT rate** menu.
2. Enter the value in the input field.

   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79
3. Press the **Enter key**.

▷ **The fertiliser settings window with the new TELIMAT rate is displayed.**

4.5.6 Calibration

NOTICE

The **Calibration** menu is locked for the **M EMC function** and in the **AUTO km/h + AUTO kg** operating mode. This menu point is inactive.

In this menu, you can determine the flow factor based on a calibration and save it in the control unit.

Carry out calibration:

- Before spreading for the first time.
- If the fertiliser quality has changed significantly (moisture, high dust content, cracked grain).
- If a new fertiliser type is used.

The calibration must be conducted with engaged PTO at a standstill or during travel over a test track.

- Remove both spreading discs.
- Set the drop point to calibration position (DP 0).

Entering the working speed:

1. Open the **Fertiliser settings > Start calibration** menu.
2. Enter the average working speed.

   This value is required for calculation of the slide position during calibration.
3. Press the **Enter key**.
   - ▷ The new value is saved in the control unit.
   - ▷ The **Move to drop point** alarm message appears in the display.

⚠ CAUTION

Risk of injury due to automatic drop point adjustment

With machines equipped with electrical drop point actuators, the **Move to drop point** alarm message appears. Upon activation of the **Start/Stop** key, the drop point is automatically moved to the preset value by means of the electrical actuating cylinders. This may cause injury and property damage.

▶ Before actuating the **Start/Stop** key, ensure that **nobody** is present in the danger zone of the machine.

4. Press the **Start/Stop** key.
   - ▷ The drop point is activated.
   - ▷ The alarm is cleared.
   - ▷ The **Prepare calibration** operating screen is displayed.

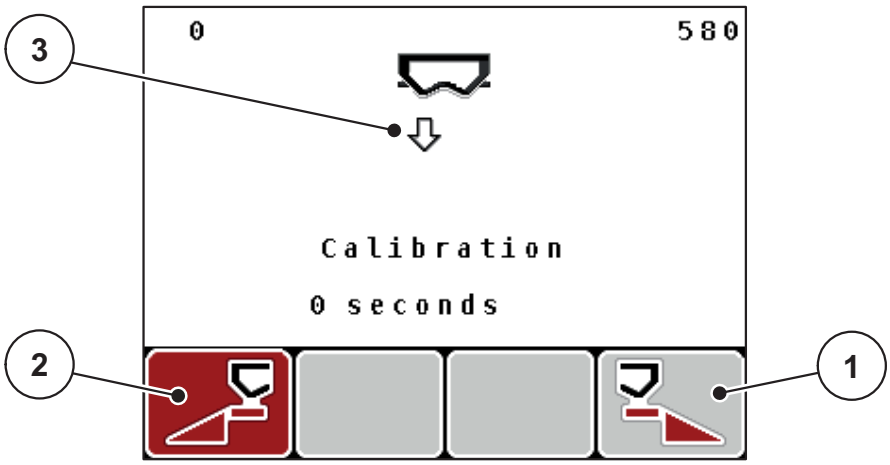


Figure 4.9: Prepare calibration operating screen

[1] Symbol above function key F4 to select right spreading side
[2] Symbol above function key F1 to select left spreading side
[3] The selected section is displayed.

Selecting the section:

5. Set the spreading side on which the calibration is to be carried out.

- Press the **F1** function key to select **left** spreading side.
- Press the **F4** function key to select **right** spreading side.

▷ **The icon indicating the selected spreading side has a red background.**

Running the calibration test:

⚠ WARNING

Risk of injury during calibration

Rotating machine components and ejected fertiliser may cause injury.

▶ **Before starting** the calibration, it is to be ensured that all preconditions have been met.
▶ Observe the **calibration** chapter in the operating manual of the machine.

6. Press the **Start/Stop** key.

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

▷ The **Run calibration** operating screen is displayed.

NOTICE

The calibration can be stopped at any time by pressing the **ESC key**. The metering slide is closed and the **Fertiliser settings** menu is displayed.

NOTICE

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

7. Press the **Start/Stop** key once more.
   - ▷ The calibration is finished.
   - ▷ The metering slide is closed.
   - ▷ The display shows the **Input collected weight** menu.

Recalculating the flow factor

⚠ WARNING

Risk of injury due to rotating machine components

Contact with rotating machine components (universal drive shaft, hubs) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught or pulled in.

- ▶ Switch off the tractor motor.
- ▶ Switch off the PTO and secure it against unauthorised activation.

8. Weigh collected weight (taking into account the empty weight of the collecting vessel).
9. Input collected weight.

   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
10. Press the **Enter key**.
    - ▷ The new value is saved in the control unit.
    - ▷ The **Flow factor calculation** menu is displayed.

NOTICE

The flow factor must be between 0.4 and 1.9.

11. Determine the flow factor.

    For taking over the **newly calculated** flow factor, press the **Enter key**.

    For confirming the **previously saved** flow factor, press the **ESC key**.

▷ **The flow factor is saved.**

▷ **The Move to drop point alarm message appears in the display.**

▷ **The Fertiliser settings menu is displayed.**

4.5.7 Spreading disc type

NOTICE

For **optimal empty run measurement**, you must check the correct input in the **Fertiliser settings** menu.

- The inputs in the **Spreading disc** and **PTO** menu items must absolutely comply with the actual settings of your machine.

The mounted disc type is pre-programmed as a standard at the factory. If you have mounted different spring discs on your machine, you must enter the correct type in your control unit.

1. Open the **Fertiliser settings > spreading disc** menu item.
2. Highlight the disc type with the bar in the selection list.
3. Press the **Enter key**.
   ▷ The selected disc type is marked with a tick.
4. Press the **ESC** key

▷ **The display shows the Fertiliser settings window with the new spreading disc type.**

4.5.8 PTO

NOTICE

For **optimal empty run measurement**, you must check the correct input in the **Fertiliser settings** menu.

- The inputs in the **Spreading disc** and **PTO** menu items must absolutely comply with the actual settings of your machine.

The specified PTO speed is preprogrammed in the control unit to 540rpm as a standard factory setting. If you want to specify a different PTO speed, you must change the stored value in the control unit.

1. Open the **Fertiliser settings > PTO** menu item.
2. Input speed.

   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
3. Press the **Enter key**.

▷ **The display shows the Fertiliser settings window with the new PTO speed.**

NOTICE

Please observe chapter: Mass flow control with the M EMC function, page 85.

4.5.9 Calculate OptiPoint

In the **Calculate OptiPoint** menu, you can enter the parameters to calculate the optimum switch-on and switch-off distances **in the headland**.

1. Open the **Fertiliser settings > Calculate OptiPoint** menu.
   ▷ The first page of the **Calculate OptiPoint** menu is displayed.

NOTICE

For the range index for the applied fertiliser, please refer to the fertiliser chart of the machine.

2. Enter the range index number from the provided fertiliser chart.
   See also 4.12.2: Entering values with the cursor keys, page 79.
3. Press the **Enter key**.
   ▷ The second page of the menu is displayed.

NOTICE

The indicated forward speed refers to the forward speed in the area of the switching positions! See chapter 5.8: GPS Control, page 90.

4. Enter the **average forward speed** in the range of switching positions.
5. Press the **Enter key**.
   ▷ The third page of the menu is displayed.

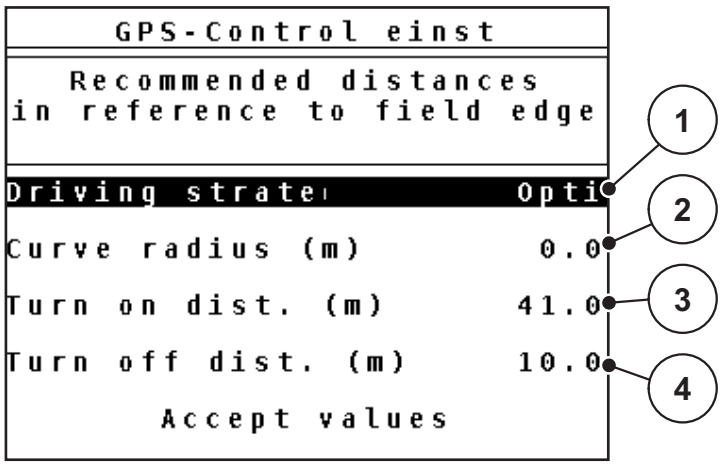


Figure 4.10: Calculate OptiPoint

Number	Meaning	Description
1	Driving strategy: ● OPTI (OPTIMAL): - The switch-off distance is close to the field border; - The tractor makes a turn between the headland track and the field border or outside the field. ● GEOM (GEOMETRICALLY) - The switch-off position is closer to the centre of the field. - **The GEOM option should only be used in special cases!** Contact your dealer.	page 91
2	The curve radius is used for calculating the switch-off distance for the GEOM driving strategy. With the OPTI driving strategy, leave the curve radius at 0.	With the **OPTI** driving strategy, the entered curve radius **has no influence**
3	Distance (in meters) with reference to the field border at which the metering slides open.	page 92
4	Distance (in meters) in reference to the field border from which the metering slides close.	page 93

NOTICE

On this page, the parameters can be manually adjusted. Refer to chapter 5.8: GPS Control, page 90.

Changing the values

6. Highlight the selected input.

7. Press the **Enter key**.

8. Enter the new values.

9. Press the **Enter key**.

10. Highlight the **Accept values** menu item.

11. Press the **Enter key**.

▷ **The OptiPoint has been calculated.**

▷ **The control unit changes to the GPS Control Info window.**

4.5.10 GPS Control info

The **GPS Control Info** menu provides information on the calculated values set in the Calculate OptiPoint menu.

- **Manually** enter the values displayed here in the respective settings menu of the GPS terminal.

NOTICE

This menu is for information purposes only.

- Observe the operator's manual of your GPS terminal.

1. Open the **Fertiliser settings > GPS Control Info** menu.

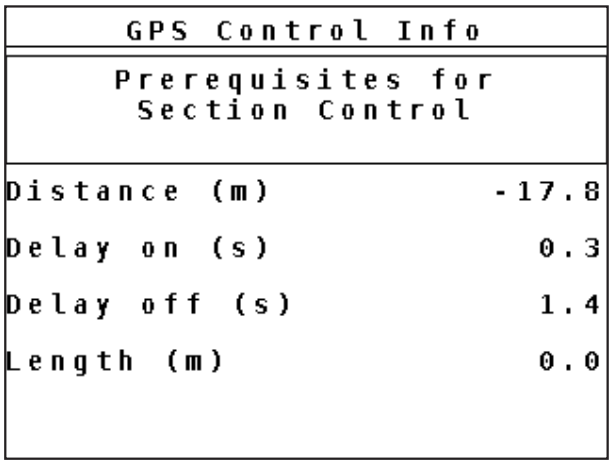


Figure 4.11: GPS Control info menu

4.5.11 Fertiliser chart

In these menus, you can create and manage your own **fertiliser charts**.

NOTICE

The selection of a fertiliser chart has an effect on the fertiliser settings on the control unit and the machine. The application rate setting remains unaffected.

Creating a new fertiliser chart

The control unit can store up to **30** fertiliser charts.

1. Open the **Fertiliser settings > Fertiliser chart** menu.

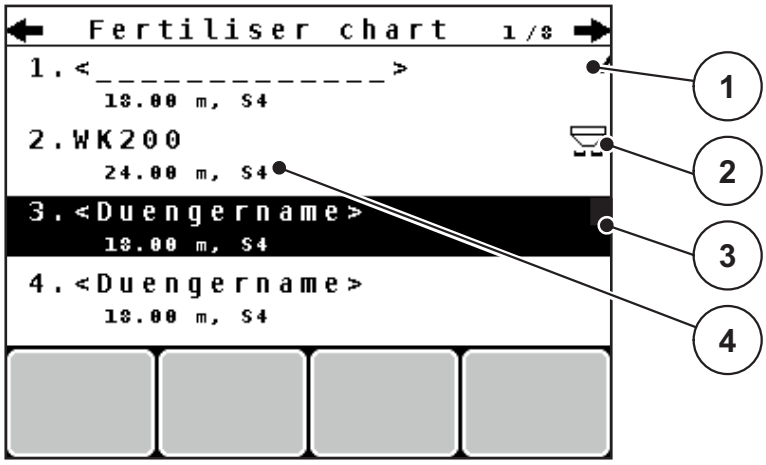


Figure 4.12: Fertiliser chart menu

[1] Display of the fertiliser chart filled with values
[2] Display of the active fertiliser chart
[3] Empty fertiliser chart
[4] Fertiliser chart name field

2. Highlight the **name field** of an empty fertiliser chart.
3. Press the **Enter key**.
   ▷ The selection window is displayed.
4. Highlight the **Open and return...** option.
5. Press the **Enter key**.
   ▷ The **Fertiliser settings** menu is displayed and the selected element is loaded into the fertiliser settings as **Active fertiliser chart**.
6. Highlight the **Fertiliser name** menu item.
7. Press the **Enter key**.
8. Enter the name for the fertiliser chart.

NOTICE

We recommend giving the fertiliser chart the name of the fertiliser. This way, specific fertilisers can be assigned to fertiliser charts more easily.

9. Edit the parameters of the **fertiliser chart**.
   Refer to chapter 4.5: Fertiliser settings, page 31.

Selecting a fertiliser chart:

1. Open the **Fertiliser settings > Fertiliser chart** menu.
2. Highlight the required fertiliser chart.
3. Press the **Enter key**.
   ▷ The selection window is displayed.
4. Highlight the **Open and return...** option.
5. Press the **Enter key**.

▷ **The Fertiliser settings menu is displayed and the selected element is loaded into the fertiliser settings as Active fertiliser chart.**

Copying an existing fertiliser chart

1. Highlight the required fertiliser chart.
2. Press the **Enter key**.
   ▷ The selection window is displayed.
3. Highlight the **Copy element** option.
4. Press the **Enter key**.

▷ **A copy of the fertiliser chart is now on the first free position of the list.**

Deleting an existing fertiliser chart

1. Highlight the required fertiliser chart.
2. Press the **Enter key**.
   ▷ The selection window is displayed.
3. Highlight the **Delete element** option.
4. Press the **Enter key**.

▷ **The fertiliser chart is deleted from the list.**

NOTICE

The active fertiliser chart **cannot** be deleted.

4.5.12 Varispread calculation

The VariSpread section assistant calculates the section steps based on your inputs made on the first pages of the **fertiliser settings**.

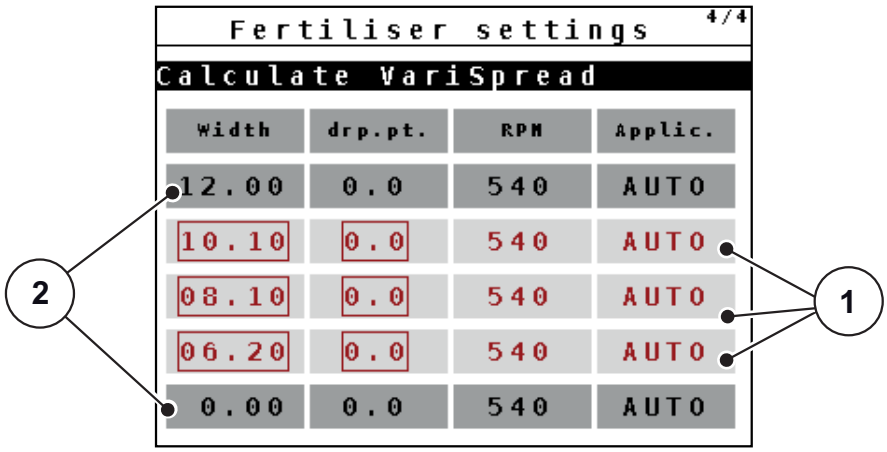


Figure 4.13: VariSpread calculation, example with 8 sections (4 on each side)

[1] Adjustable section settings
[2] Predefined section settings

1. Press the **VariSpread calculation** menu entry.
   ▷ The control unit will calculate the settings values.
   ▷ The calculated values are filled into the table.
   ▷ The quantity reduction is set to **AUTO**.

NOTICE

Up to 3 section steps can be set.

- The first line corresponds to the pre-set values from the **Fertiliser settings** menu. These values are fixed and cannot be modified.
- Lines 2 to 4 represent the adjustable section.
- You can adjust the different values in the table according to your requirements.
  - Width (m): Spreading width referring to one spreading side,
  - DP: Drop point at reduced speed,
  - Quantity (%): Shortage quantity as percentage reduction of the set application rate.

NOTICE

The quantity adjustment of 0% automatically corresponds to the quantity required in the case of the reduced working width and should not be changed!

- The last line corresponds to the closed position of the sections. No fertiliser is spread.

Adjustment of section values

- Requirements: The VariSpread calculation menu item is highlighted.

1. Press the arrow down key.
   ▷ The input field for the first value in the chart is highlighted.
2. Use the **Arrow up / arrow down** keys to enter the value.
3. Use the **Arrow right** key to change over to the subsequent number to be modified.
4. Press the **Enter key**.
   ▷ The value is stored.
5. Use the **Arrow right** key to change over to the subsequent input field to be modified.
6. Adjust the values to your requirements.
   See also “Entering values with the cursor keys“ on page 79.
7. Check the values in the table.

NOTICE

- To reset the adjusted values to the automatically calculated values, press **VariSpread calculation**.
- Use the **Arrow left** key to navigate upwards through the chart up to the **VariSpread calculation** item.

NOTICE

If the working width or the drop point is not adjusted in the **Fertiliser settings** menu, the VariSpread calculation will be implemented automatically in the background.

4.6 Machine settings

In this menu, the tractor and machine settings can be configured.

- Open the **Machine settings** menu.

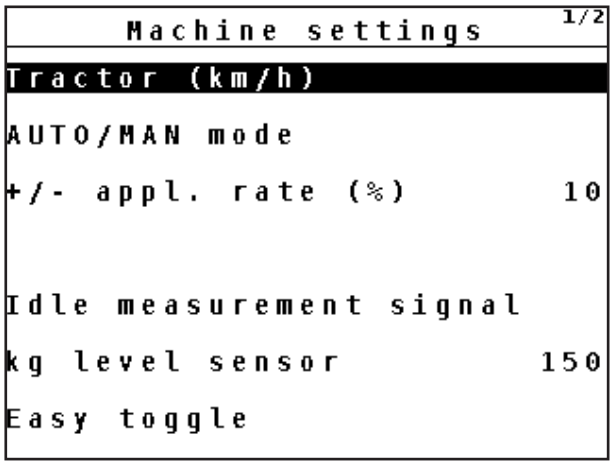


Figure 4.14: Machine settings menu

NOTICE

Not all parameters are displayed simultaneously in one menu window. The **Arrow keys** enable switching to the next or previous windows.

Sub-menu	Meaning	Description
Tractor (km/h)	Determining or calibrating the speed signal.	page 50
AUTO / MAN mode	Setting the automatic or manual operating mode.	page 53
+/- application rate	Pre-setting the quantity reduction for the different spreading types.	page 56
Signal for empty run measurement	Activation of the signal tone when starting the automatic empty run measurement	
kg level sensor:	Input of the residual quantity to trigger an alarm message via the weigh cells.	
Easy toggle	Restricts the L%/R% toggle key to two conditions.	page 57

Sub-menu	Meaning	Description
FF limit 0.2	Extension of the flow factor range from 0.4 to 0.2. Application: ● Organic fertiliser ● Rice	
Application rate correction L/R (%)	Correction of the deviations between the entered application rate and the actual application rate. ● Correction in percent either on the right or left side	

4.6.1 Forward speed calibration

The speed calibration is the basic requirement for an exact spreading result. Factors such as tyre size, a different tractor, all-wheel drive, slippage between tyres and ground, ground characteristics and tyre pressure influence the speed measurement and therefore the spreading result.

Preparing the speed calibration:

The exact calculation of the number of speed pulses over 100m is very important for the precise discharge of the fertiliser quantity.

- Conduct the calibration on the field. This reduces the influence of the ground characteristics on the calibration result.
- Determine a **100 m** long reference track as precisely as possible.
- Switch on four-wheel drive.
- Fill only half of the machine, if possible.

Access the forward speed calibration:

In the QUANTRON-A control unit, you can save up to **4 different profiles** for the type and number of pulses. You can assign names to these profiles (e.g. tractor name).

Before spreading, check that the correct profile is opened in the control unit.

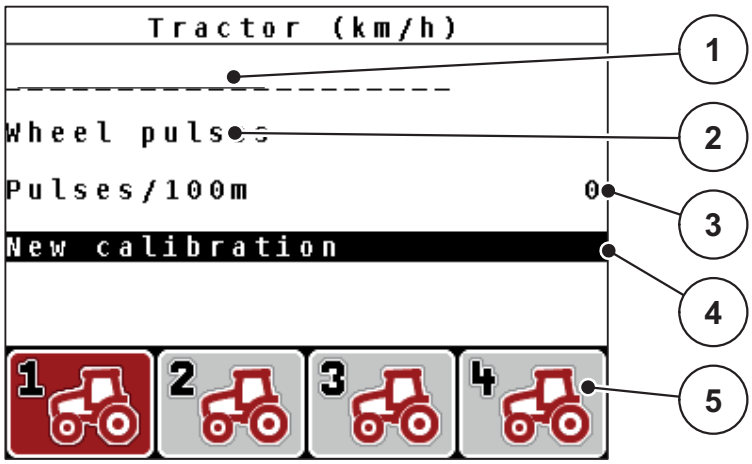


Figure 4.15: Tractor (km/h) menu

[1] Tractor type
[2] Transducer display for the speed signal
[3] Display of number of pulses over 100m
[4] New calibration submenu
[5] Icons for memory locations of profiles 1 to 4

1. Open the **Machine settings > Tractor (km/h)** menu.

   The displayed values for name, origin and number of pulses refer to the profile highlighted in black.

2. Press the function key (**F1-F4**) under the memory location symbol.

Recalibrating the forward speed signal:

You can either overwrite an existing profile or create a profile in an empty memory location.

1. Select the desired memory location in the **Tractor (km/h)** menu using the function key below.
2. Select the **New calibration** field.
3. Press the **Enter key**.

▷ **The display shows the Tractor (km/h) calibration menu.**

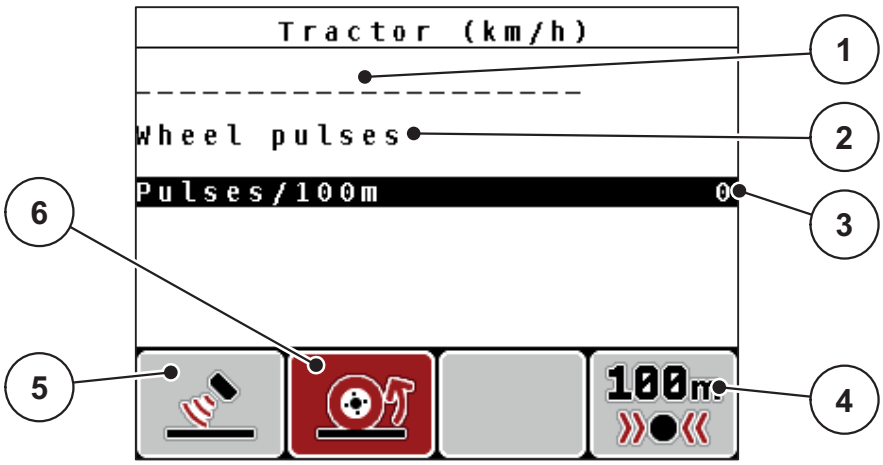


Figure 4.16: Tractor (km/h) calibration menu

[1] Tractor name field
[2] Display of origin of speed signal
[3] Display of number of pulses over 100m
[4] Automatic calibration sub-menu
[5] Radar pulse transducer
[6] Wheel pulse transducer

4. Highlight the **Tractor name field**.
5. Press the **Enter key**.
6. Input the name of the profile.

NOTICE

The input of the name is restricted to **16 characters**.

We recommend using the profile with the name of the tractor for ease of understanding.

Entering text into the control unit is described in section 4.12.1: Text input, page 77.

7. Select the pulse transducer for the forward speed signal.
   - For **Radar pulses**, press the **F1** [5] function key.
   - For **Wheel pulses**, press the **F2** [6] function key.

▷ **The pulse transducer is displayed.**

The number of pulses of the speed signal must still be specified below. If you know the exact number of pulses, you can enter it directly:

8. Open the **Tractor (km/h) > New calibration > Imp/100m** menu item.

▷ **The Pulses menu for manual pulse count input is displayed.**

Entering values into the control unit is described in section 4.12.2: Entering values with the cursor keys, page 79.

If the exact pulse count **is unknown**, a **calibration** has to be started.

9. Press the **F4 (100 m AUTO)** function key.

▷ The calibration run operating screen is shown in the display.

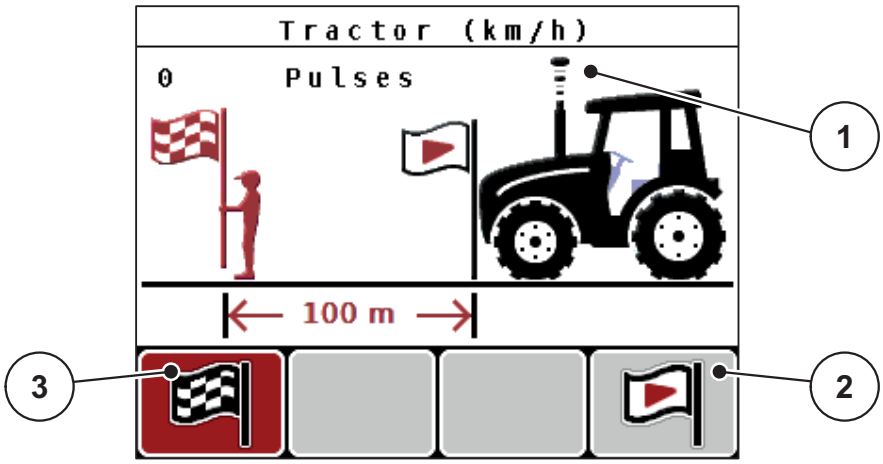


Figure 4.17: Calibration run speed signal operating screen

[1] Pulse display
[2] Start recording pulses
[3] Stop recording pulses

10. Press **F4** [2] at the starting point of the reference distance.

▷ The pulse display is now on zero.

▷ The control unit is ready for counting pulses.

11. Drive along the 100m long reference distance.

12. Stop tractor at the end of the reference distance.

13. Press the **F1 [3]** function key.

▷ The display shows the number of received pulses.

14. Press the **Enter key**.

▷ **The new pulse count is saved.**

▷ **The calibration menu is displayed again.**

4.6.2 AUTO/MAN mode

By default, you will work in the **AUTO km/h + AUTO kg** mode. The control unit automatically controls the actuators on the basis of the forward speed signal and the **M EMC function**.

You will work in **manual** operating mode (MAN scale or MAN km/h) in the following cases **only**:

- there is no speed signal (radar or wheel sensor not available or defective),
- application of slug pellets or seeds (fine seeds).

NOTICE

For uniform spreading of the spreading material, a **constant forward speed** has to be applied in manual operating mode.

NOTICE

Spreading work with different operating modes is described in chapter 5: Spreading operation with the QUANTRON-A control unit, page 81.

Menu	Meaning	Description
AUTO km/h + AUTO kg	Selecting the automatic mode with automatic weighing	page 54
AUTO km/h	Selecting the automatic mode	page 54
MAN km/h	Adjustment of forward speed for manual mode	page 54
MAN scale	Metering slide adjustment for manual mode	page 55

Selecting the operating mode

1. Switch on the QUANTRON-A control unit.
2. Open the **Machine settings > AUTO / MAN mode** menu.
3. Highlight the desired menu item.
4. Press **Enter**.

NOTICE

It is recommended to have the flow factor displayed in the operating screen. This way, the mass flow control can be observed during spreading. Please refer to chapter 4.9.2: Display configuration, page 68 and chapter 4.6.2: AUTO/MAN mode, page 53.

- Important information on the use of operating modes for spreading is provided in chapter 5.4: Spreading with automatic operating mode (AUTO km/h + AUTO kg), page 85.

AUTO km/h + AUTO kg: automatic operation with automatic mass flow control:

The **AUTO km/h + AUTO kg** operating mode continuously controls the fertiliser quantity during spreading operation according to the forward speed and the flow behaviour of the fertiliser. This optimises the metering of the fertiliser.

AUTO km/h: Automatic operation

NOTICE

In order to achieve an optimum spreading result, you should carry out a calibration before starting to spread.

1. Switch on the QUANTRON-A control unit.
2. Open the **Machine settings > AUTO / MAN mode** menu.
3. Highlight the **AUTO km/h** menu item
4. Press the **Enter key**.
5. Configure the fertiliser settings:
   - Application rate (kg/ha)
   - Working width (m)
6. Fill the hopper with fertiliser.
7. Carry out calibration for flow factor determination

   or

   Determining flow factor from the provided fertiliser chart.
8. Enter the flow factor manually.
9. Press the **Start/Stop** key.

▷ **The spreading starts.**

MAN km/h: manual operation

1. Switch on the QUANTRON-A control unit.
2. Open the **Machine settings > AUTO / MAN mode** menu.
3. Select **MAN km/h** in the menu.

   ▷ The **Forward speed** input window is displayed.
4. Enter the forward speed during spreading.
5. Press the **Enter key**.

NOTICE

In order to achieve an optimum spreading result, you should carry out a calibration before starting to spread.

MAN scale: manual operation with scale value

1. Open the **Machine settings > AUTO / MAN mode** menu.
2. Select **MAN scale** in the menu.
   ▷ The display shows the **metering slide opening** menu.
3. Enter the scale value for the metering slide opening.
4. Press the **Enter key**.
   See 4.12.2: Entering values with the cursor keys, page 79.

▷ **The operating mode setting is saved.**

NOTICE

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

The **MAN scale** operating mode enables manual adjustment of the metering slide opening during spreading.

Requirements:

- The metering slides are open (activation with the **Start/Stop** key).
- In the **MAN scale** operating screen, the icons for sections are filled in red.

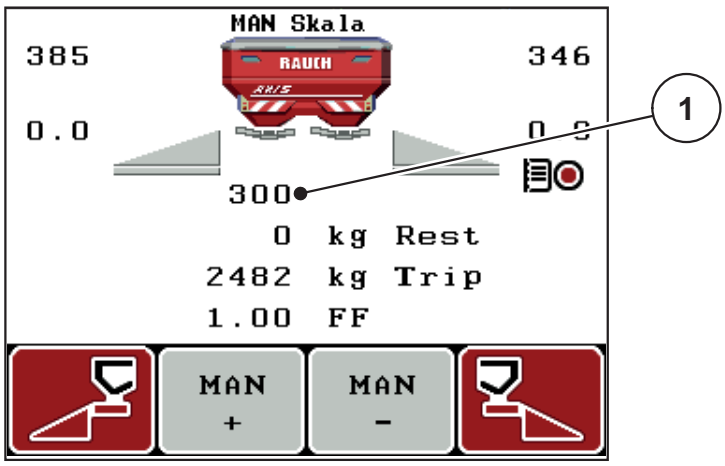


Figure 4.18: MAN scale operating screen

[1] Display of the current scale position of the metering slide

5. For changing the metering slide opening press **F2** or **F3**.
   F2: **MAN+** to increase the metering slide opening
   F3: **MAN-** to reduce the metering slide opening.

4.6.3 +/- quantity

In this menu, an **Application rate adjustment** percentage for standard spreading can be specified.

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

NOTICE

During operation, you can use the **F2/F3** function keys to change the application rate by the factor of **+/- application rate** at any time.

By pressing the **C 100 % key** you reset the presettings.

Specifying the quantity reduction:

1. Open the **Machine settings > +/- Quantity (%)** menu.
2. Enter the percentage by which the application rate is to be adjusted.

   Refer to chapter 4.12.2: Entering values with the cursor keys, page 79.
3. Press the **Enter key**.

4.6.4 Signal for empty run measurement

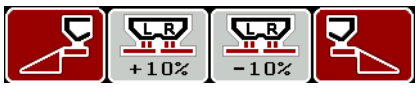
Here you can activate or deactivate the signal tone for the accomplishment of the empty run measurement.

1. Highlight the **empty run measurement** menu item.
2. Activate the option by pressing the **Enter key**.
   - ▷ The display shows a tick.
   - ▷ There is an acoustic signal for each start of an automatic idle measurement.
3. Deactivate the option by pressing the **Enter key** once more.
   - ▷ The tick disappears.

4.6.5 Easy Toggle

Here, you can limit the toggle function of the **L%/R %** key to 2 conditions of the **F1** to **F4** function keys. By doing so, you can avoid unnecessary toggling action in the operating screen.

1. Highlight the **Easy Toggle** sub-menu
2. Press the **Enter key**.
   - ▷ The display shows a tick.
   - ▷ The option is active.
   - ▷ In the operating screen, the **L%/R%** key may only alternate between the quantity change (L+R) and section management (VariSpread) functions.
3. Press the **Enter key**.
   - ▷ The tick disappears.
   - ▷ The 4 different conditions can be switched with the **L%/R%** key.

Assignment of function keys	Function
	Application rate change on both sides
	Quantity change on the right side **Hidden if the Easy toggle function is active**
	Quantity change on the left side **Hidden if the Easy toggle function is active**
	Increase or reduce sections

4.7 Fast emptying

In order to quickly clean the machine after the spreading work or to quickly empty any residual quantities, the **Fast emptying** menu can be selected.

Before storing the machine, we recommend to **completely open** both metering slides via the fast emptying function and to switch off the QUANTRON-A in this state. This prevents accumulation of humidity in the hopper.

NOTICE

Before starting the fast emptying process, it has to be ensured that all preconditions have been met. Please observe the operator's manual of the machine (emptying of remaining material).

Carrying out the fast emptying process:

1. Open the **Main menu > Fast emptying** menu.

⚠ CAUTION

Risk of injury due to automatic adjustment of the drop point!

With machines equipped with electrical drop point actuators, the **Move to drop point** alarm message appears. Upon activation of the **Start/Stop** key, the drop point is automatically moved to the preset value by means of the electrical actuating cylinders. This may cause injury and property damage.

- ▶ Before pressing **Start/Stop**, ensure that **nobody** is present in the danger zone of the machine.

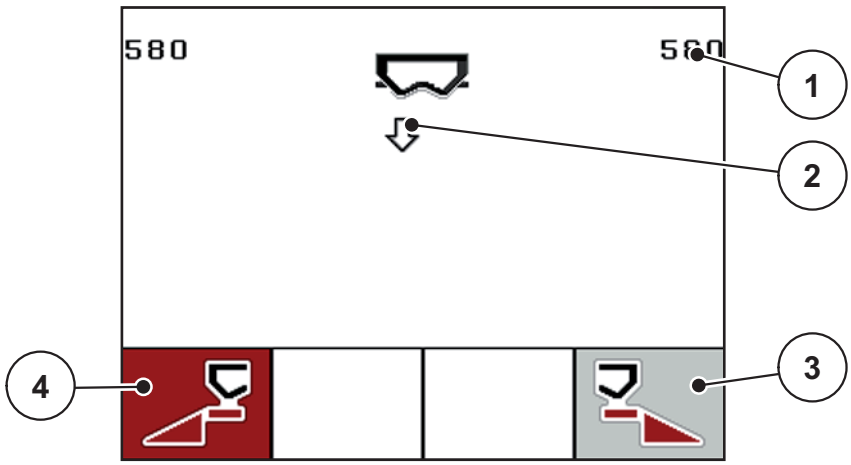


Figure 4.19: Fast emptying menu

[1] Metering slide opening display
[2] Symbol for fast emptying (here: left side selected, but not yet started)
[3] Fast emptying of right section (not selected)
[4] Fast emptying of left section (selected)

2. Press the **Function key** to select the section for which the fast emptying function is to be carried out.
   ▷ The selected section is shown as an icon in the display.
3. Press the **Start/Stop** key.
   ▷ The fast emptying process starts.
4. Press the **Start/Stop key** again.
   ▷ The fast emptying process is completed.

With machines equipped with electrical drop point actuators, the **Move to drop point** alarm message appears.

5. Press the **Start/Stop** key.
   ▷ The alarm is acknowledged.
   ▷ The electrical actuators are activated at the pre-set value.
6. Press the **ESC** key to return to the **main menu**.

4.8 Field data

In this menu, you can create and manage up to **200 field data**.

- Open the **Main menu > Field data** menu.

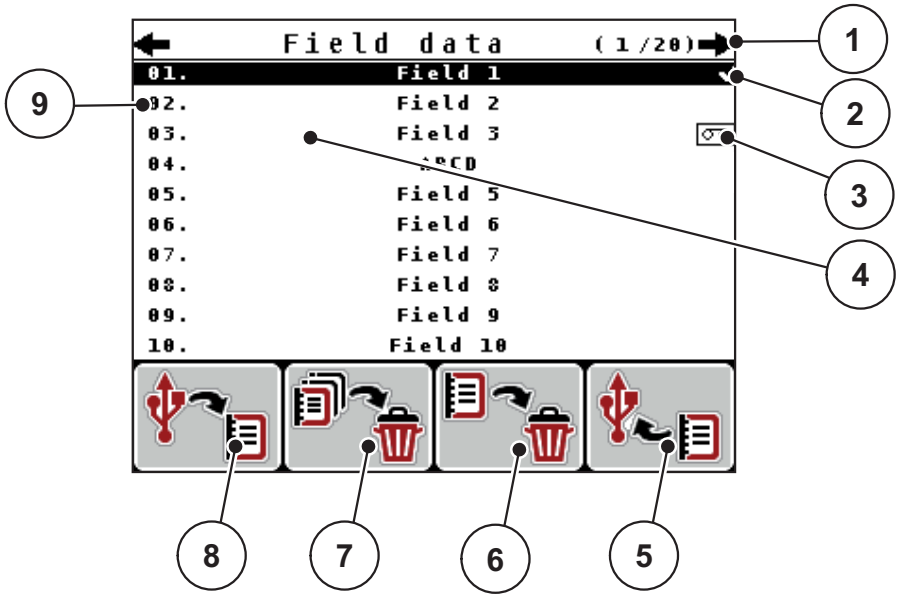


Figure 4.20: Field data menu

[1] Display of page number
[2] Display of the field data filled with values
[3] Display of active field data
[4] Name of field data
[5] F4 function key: Export
[6] F3 function key: Deleting field data
[7] F2 function key: Deleting all field data
[8] F1 function key: Import
[9] Display of memory location

4.8.1 Selecting a field data

Already saved field data files can be selected and processed again. The data already saved in the field data are **not overwritten**, but instead the new values are **added**.

NOTICE

With the **left/right arrow keys** you can jump forward and back through the pages in the **Field data** menu.

1. Select the required field data.
2. Press the **Enter key**.
   ▷ The first page of the current field data is displayed.

4.8.2 Starting the recording

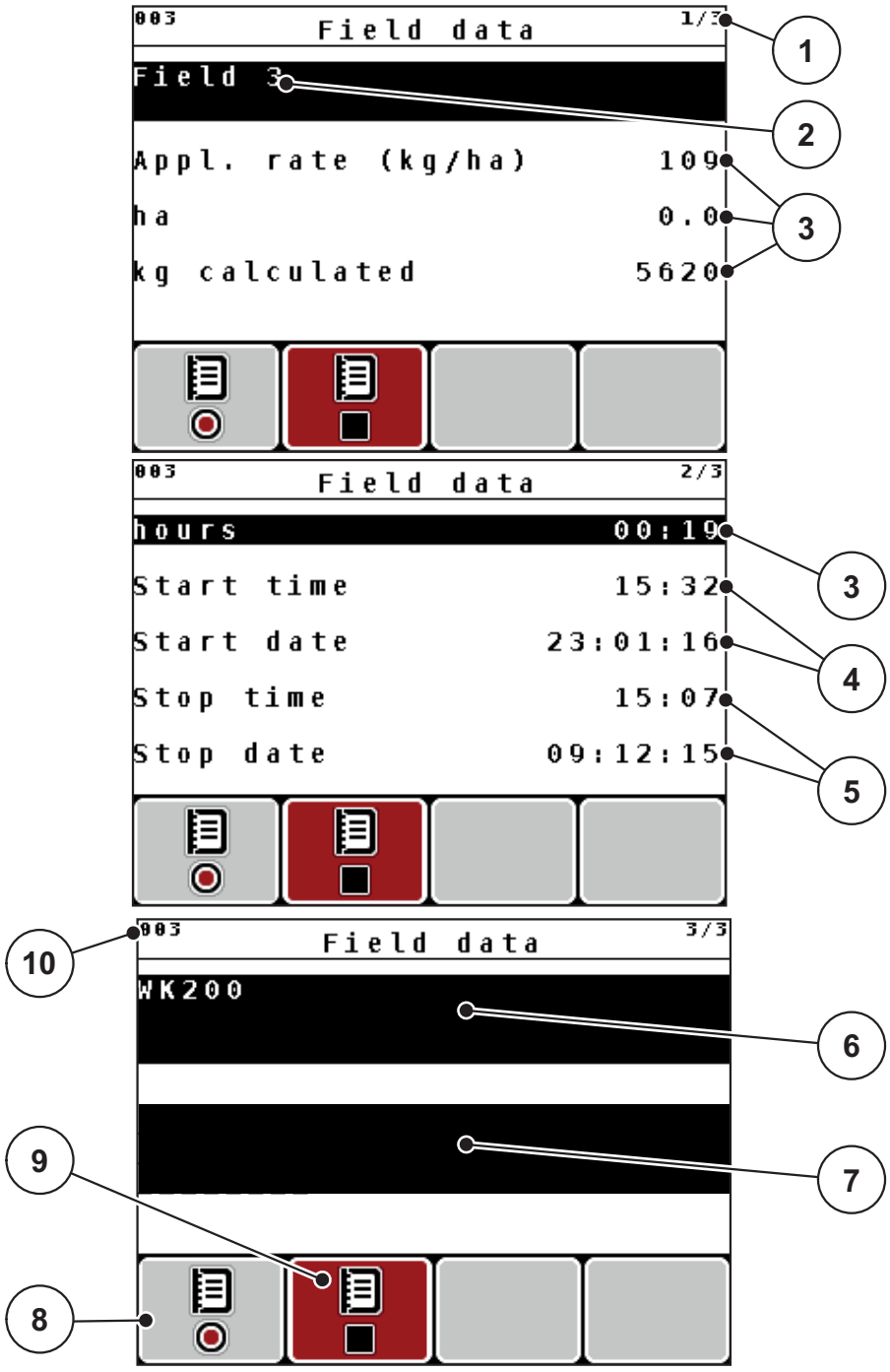


Figure 4.21: Display of current field data

[1] Display of the page number
[2] Name field of field data
[3] Value fields
[4] Display of the start time/date
[5] Display of the stop time/date
[6] Name field of fertiliser
[7] Name field of fertiliser manufacturer
[8] F1 start function key
[9] F2 stop function key
[10] Display of memory location

3. Press the **F1** function key under the start icon.
   ▷ The recording starts.
   ▷ The **field data** menu displays the **recording symbol** for the current field data.
   ▷ The **operating screen** displays the **recording symbol**.

NOTICE

If another field is opened, this field will be stopped. Only inactive fields can be deleted.

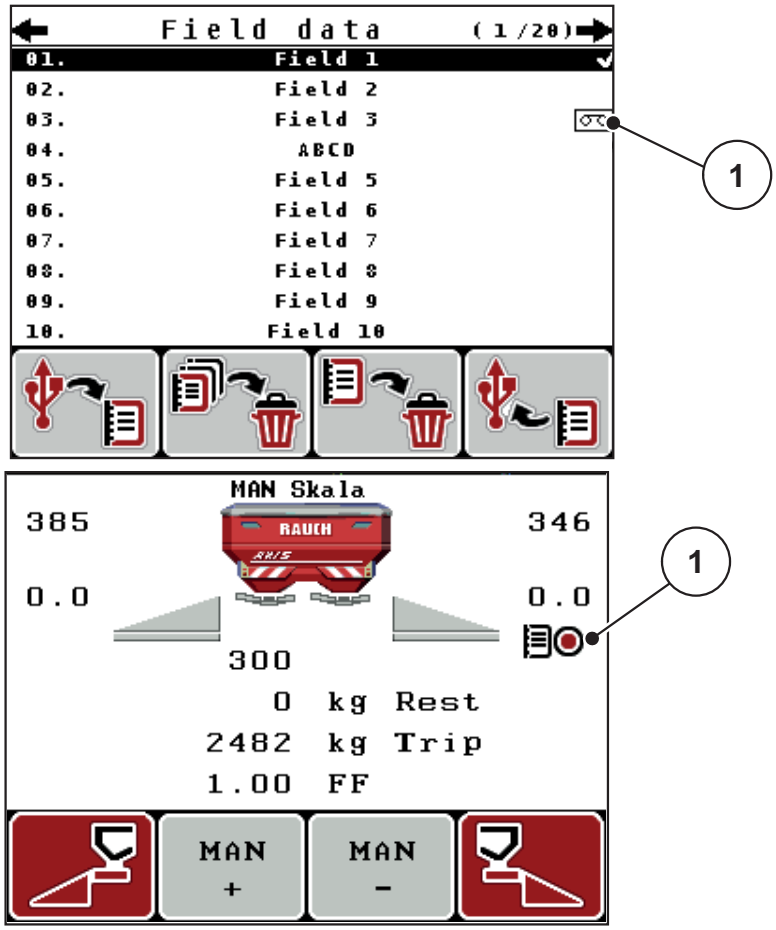


Figure 4.22: Recording symbol display

[1] Recording symbol

4.8.3 Stopping the recording

1. In the **Field data** menu, access the 1st page of the active field data.
2. Press the **F2** function key below the stop icon.
   ▷ Recording is finished.

4.8.4 Importing and exporting field data

The control unit QUANTRON-A allows for importing and/or exporting the recorded field data.

Importing field data (PC to QUANTRON-A)

Requirements:

- Use the USB stick supplied.
- **Do not** alter the directory structure on the USB stick.
  - The data on the USB stick are available in the „\\USB-BOX\QuantronE\Schlagdateien\Import“ directory.

1. Call up the **Field data** menu.
2. Press **F1** function key (see figure 4.20).
   ▷ Error message no. 7 appears indicating that the current files will be overwritten. See 6.1: Meaning of the alarm messages, page 95.
3. Press the **Start/Stop** key.

NOTICE

You can interrupt the import of field data at any time by pressing the **ESC key**!

The consequences of importing field data are as follows

- All field data currently stored in the QUANTRON-A are overwritten.
- If you have defined the application rate on the PC, the application rate is automatically transferred and immediately activated in the **Fertiliser settings** when starting the field data.
- If you enter an application rate outside the range of 10-3000, the value in the **Fertiliser settings** menu is not overwritten.

Exporting field data (QUANTRON-A to PC)

Requirements:

- Use the USB stick supplied.
- **Do not** alter the directory structure on the USB stick.
  - The data on the USB stick are available in the „\\USB-BOX\QuantronE\Schlagdateien\Export“ directory.

1. Call up the **Field data** menu.
2. Press **F4** function key (see figure 4.20).

4.8.5 Deleting field data

The control unit QUANTRON-A allows for deleting the recorded field data.

NOTICE

Only the content of the field data is deleted; the field data name is maintained in the name field!

Deleting field data

1. Call up the **Field data** menu.
2. Select field data from the list.
3. Press the **F3** function key below the **Delete** icon (see figure 4.20).
   ▷ The selected field data has been deleted.

Deleting all field data

1. Call up the **Field data** menu.
2. Press the **F2** function key below the **Delete all** icon (see figure 4.20).
   ▷ A message appears indicating that all data will be deleted.
3. Press the **Start/Stop** key.
   ▷ All field data are deleted.

4.9 System/test

Use this menu for the system and test settings of the control unit.

- Open the **Main menu > System/test** menu.

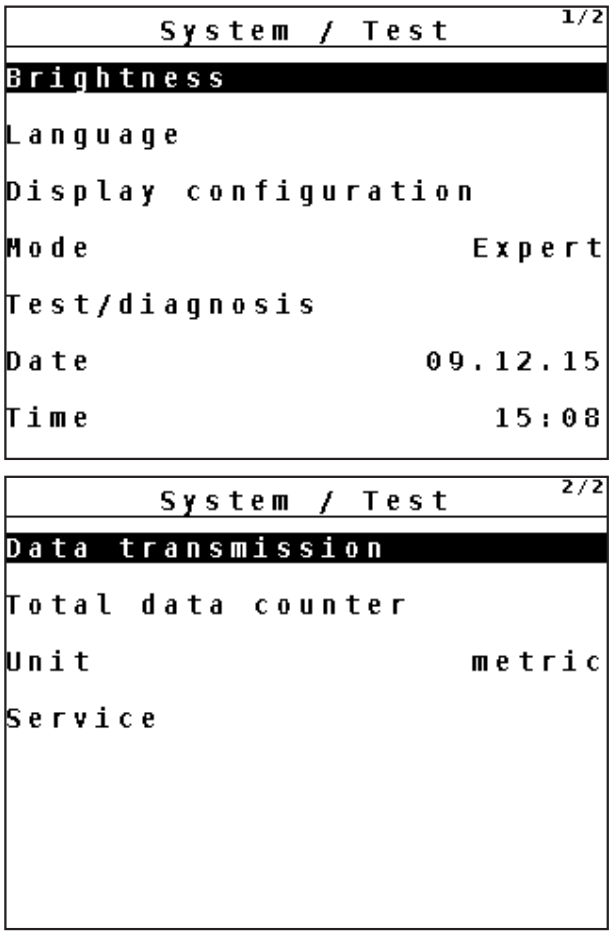


Figure 4.23: System/test menu

Sub-menu	Meaning	Description
Brightness	Setting of the display and of the key lighting.	The settings can be adjusted with the function keys **+** or **-**.
Language	Language setting for menu navigation.	page 67
Display configuration	Determining the displays on the operating screen.	page 68
Mode	For M EMC function, the mode is automatically set to Expert	
Test/diagnosis	Checking of actuators and sensors.	page 69

Sub-menu	Meaning	Description
Date	Setting the current date.	Selection and modification of settings by means of the **arrow keys**. Confirm by pressing the **Enter key**.
Time	Setting the current time.	Selection and modification of settings by means of the **arrow keys**. Confirm by pressing the **Enter key**.
Data transmission	Menu for data exchange and serial protocols	page 72
Total data counter	Display of total ● spread quantity in kg ● spread area in ha ● spread time in h ● distance travelled in km	
Unit	Conversion of units: ● Metric ● Imperial	Applies for weights, speed, distances, areas, etc. page 73
Service	Service settings	Password-protected; only accessible for service personnel

4.9.1 Setting the language

The QUANTRON-A control unit interface is available in **22 different languages**. Your language has been preset at the factory.

1. Open the **System/test > Language** menu.
   ▷ The display shows the first of four pages.

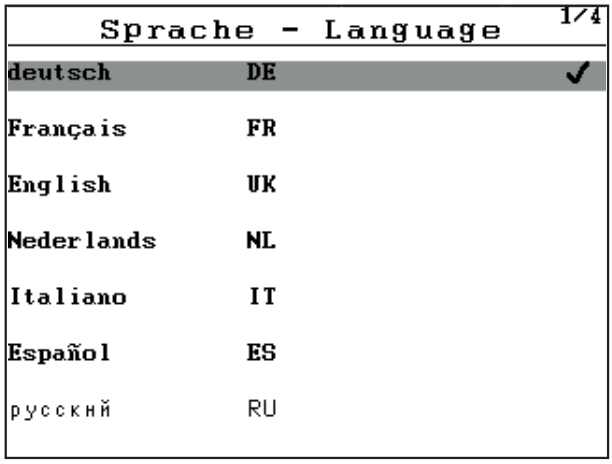


Figure 4.24: Language sub-menu, page 1

2. Select the language for the menus to be displayed.
3. Press the **Enter key**.

▷ **The selection is confirmed.**

▷ **The QUANTRON-A control unit restarts automatically.**

▷ **The menus are displayed in the selected language.**

4.9.2 Display configuration

The display fields in the operating screen of the control unit can be configured as desired. You can assign the three display fields with the following values if desired:

- Forward speed
- Flow factor (FF)
- Time
- ha trip
- kg trip
- m trip
- kg Rest
- m Rest
- ha Rest
- Idle time

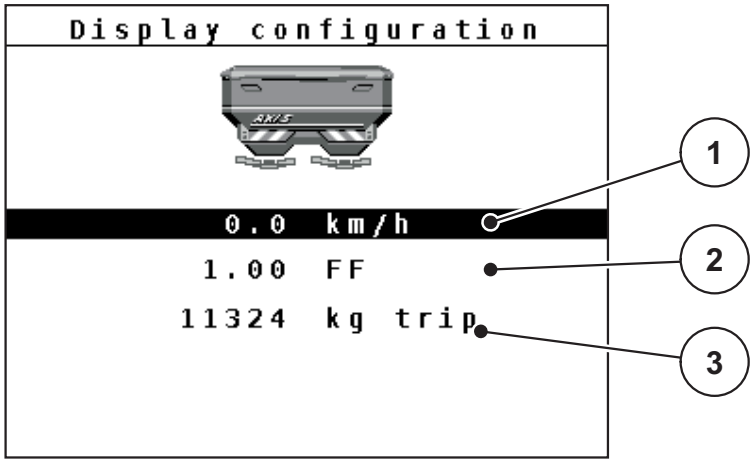


Figure 4.25: Display configuration menu

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

Select display

1. Open the **System/test > Display configuration** menu.
2. Select the required **display field**.
3. Press the **Enter key**.
   ▷ The available display options are listed.
4. Select the new value to be assigned to the display field.
5. Press the **Enter key**.
   ▷ The **operating screen** is shown on the display. The respective **display field** displays the new value.

4.9.3 Test/Diagnosis

The **Test/Diagnosis** menu enables function monitoring and checking of specific sensors/actuators.

NOTICE

This menu is for information purposes only.

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

Sub-menu	Meaning	Description
Slide test points	Test for approaching the various position points of the metering slides.	Checking the calibration
Metering slide	Driving the left and right metering slide	page 70
Voltage	Checking the operating voltage.	
Level sensor	Checking the level sensor.	
Weigh cells	Checking the weigh cells.	
M EMC	Checking the sensors for the M EMC function.	
Drop point test points	Test for approaching the various position points of the drop point.	Checking the Calibration
Drop point	Approaching the drop point.	
Linbus	Checking the assemblies registered via LINBUS.	
Hopper cover	Checking the actuators.	

Slide example

1. Open the **System/Test > Test/Diagnosis** menu.
2. Highlight the **Slide** menu item.
3. Press the **Enter key**.
   ▷ The display shows the actuator/sensor status.

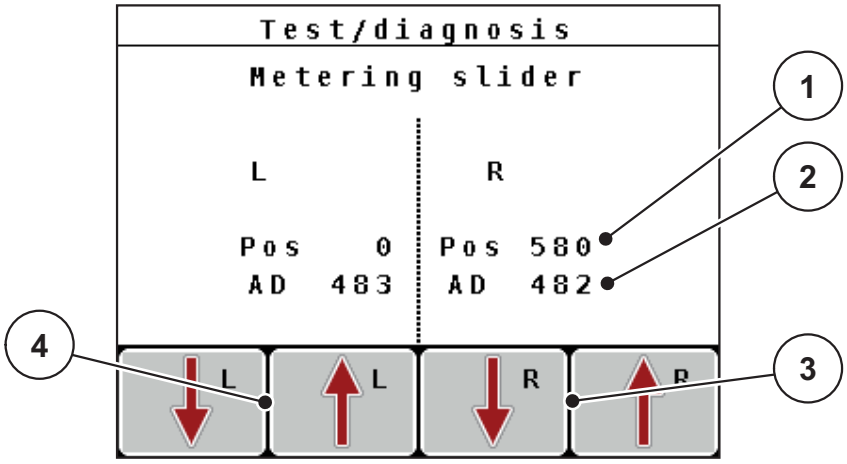


Figure 4.26: Test/diagnosis; example: Slide

[1] Position display
[2] Signal display
[3] Function keys for right actuator
[4] Function keys for left actuator

⚠ CAUTION

Risk of injury by moving machine parts.

During the tests, machine parts may start to move automatically.

▶ Ensure that nobody is present in the area of the machine before carrying out the tests.

The status of the signal for the left and right hand side is displayed separately by means of the **Signal** display.

The actuators can be extended and retracted by pressing the **F1 - F4** function keys.

Linbus example

1. Open the **System/Test > Test/Diagnosis** menu.
2. Highlight the **Linbus** menu item.
3. Press the **Enter key**.
   ▷ The display shows the actuator/sensor status.

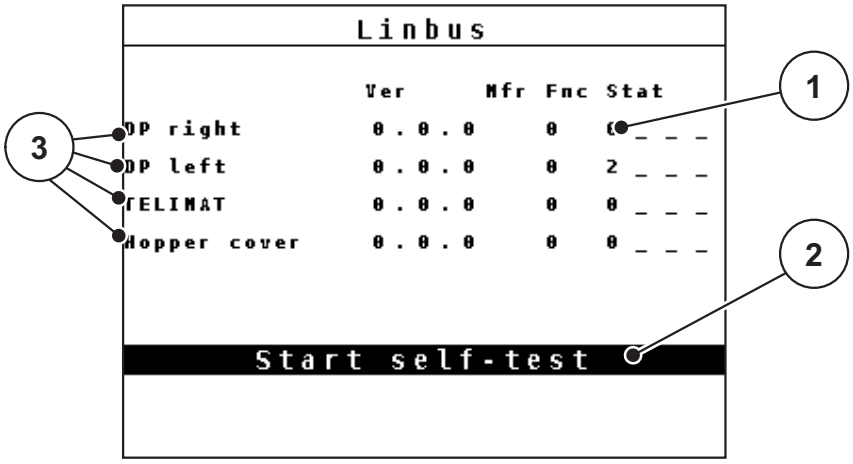


Figure 4.27: Test/diagnosis; example: Linbus

[1] Status display
[2] Start self-test
[3] Connected actuators

Linbus participant status notification

The actuators are in different conditions:

- 0 = OK; no actuator error
- 2 = blockage
- 4 = overload

⚠ CAUTION

Risk of injury by moving machine parts.

During the tests, machine parts may start to move automatically.

▶ Ensure that nobody is present in the area of the machine before carrying out the tests.

4.9.4 Data transmission

Data transmission is carried out using various data protocols.

Sub-menu	Meaning
ASD	Automatic field documentation; transmission of field data to a PDA and/or Pocket PC via Bluetooth
LH5000	Serial communication e.g. spreading using application cards
TUVR	Protocol for automatic section control, area-specific quantity changes and GPS speed by means of an external Trimble Terminal.
GPS Control	Protocol for the automatic section control with an external terminal
VRA GPS control	VRA Variable Rate Application Protocol for the automatic transmission of the target application rate and the automatic section control

4.9.5 Total data counter

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

- spread quantity in kg
- spread area in ha
- spread time in h
- distance travelled in km

NOTICE

This menu is for information purposes only.

4.9.6 Setting the system of units

Your system of units has been preset at the factory. However, the system can be changed from metric to imperial units at any time.

1. Mark the **System/Test > Unit** menu.
2. Press the **Enter key**.

▷ **The active system of units is displayed.**

▷ **All values of the various menus are converted.**

Menu/value	**Conversion factor metric to imperial**
kg rest	1 x 2.2046 lb.-mass (lbs rest)
ha Rest	1 x 2.4710 ac (ac rest)
Working width m	1 x 3.2808 ft
Application rate (kg/ha)	1 x 0.8922 lbs/ac
Mounting height (cm)	1 x 0.3937 in.

Menu/value	**Conversion factor imperial to metric**
lbs rest	1 x 0.4536 kg
ac Rest	1 x 0.4047 ha
Working width (ft)	1 x 0.3048 m
Application rate (lbs/ac)	1 x 1.2208 kg/ha
Mounting height (in.)	1 x 2.54 cm

4.9.7 Service

NOTICE

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

4.10 Information

Information on the machine control can be obtained from the **Info** menu.

NOTICE

This menu provides information on the configuration of the machine.

The information list depends on the equipment of the machine.

4.11 Hopper cover (optional equipment, electrical remote control)

⚠ WARNING

Danger of crushing and shearing due to components operated by an external force

The hopper cover will move without warning and can cause personal injury.

▶ Ensure that nobody is present in the hazard zone.

The AXIS-M machine is equipped with an electrically operated hopper cover. During the refilling process at the end of the field, the hopper cover can be opened and/or closed via the control unit and 2 actuators.

NOTICE

The menu is used for activating the actuators for opening and/or closing the hopper cover exclusively. The QUANTRON-A control unit does not detect the exact position of the hopper cover.

- Observe the movements of the hopper cover.

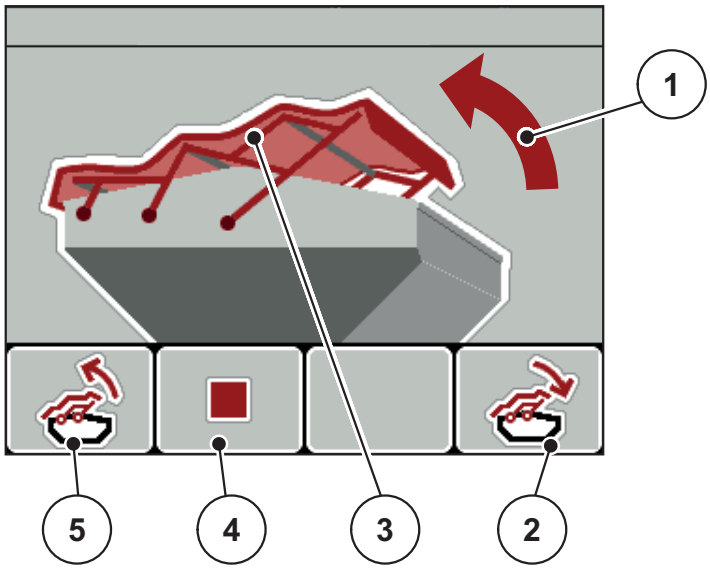


Figure 4.28: Hopper cover menu

[1] Display of opening process
[2] F4 function key: Close hopper cover
[3] Static display of hopper cover
[4] F2 function key: Stop process
[5] F1 function key: Open hopper cover

⚠ CAUTION

Material damage due to insufficient clearance

Opening and closing the hopper cover requires a sufficient clearance above the hopper. If the clearance is insufficient, the hopper cover may tear. The rods of the hopper cover may be damaged and the hopper cover may damage the environment.

▶ Ensure that there is sufficient clearance above the hopper cover.

Moving the hopper cover

1. Press the **Menu** button.
2. Open the **Hopper cover** menu.
3. Press the **F1** function key.
   - ▷ During the movement, an arrow appears which indicates the **OPEN** direction.
   - ▷ The hopper cover will open entirely.
4. Fill in the fertiliser.
5. Press the **F4** function key.
   - ▷ During the movement, an arrow appears which indicates the **CLOSED** direction.
   - ▷ The hopper cover will be closed.

If required, you can stop the movement of the hopper cover by pressing the **F2** function key. The hopper cover remains in the intermediate position until you close or open it entirely again.

4.12 Special functions

4.12.1 Text input

In some menus, freely editable text can be entered.

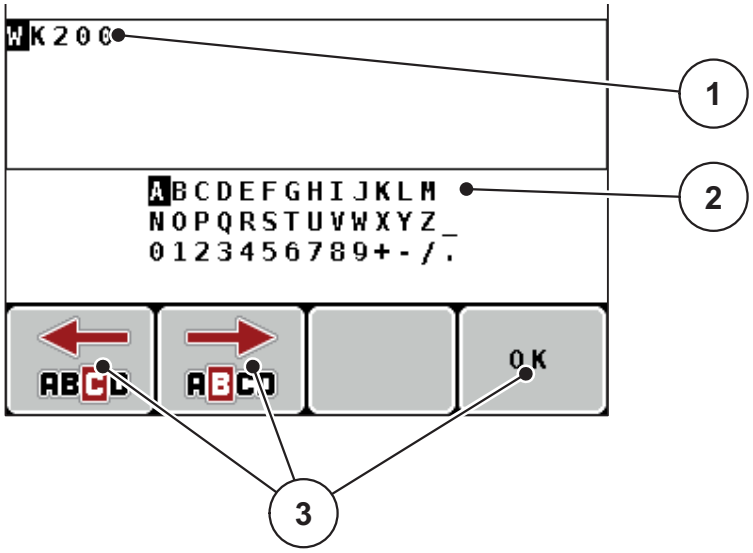


Figure 4.29: Text input menu

[1] Input field
[2] Character field, display of available characters (language-dependent)
[3] Function keys for navigation in the input field

Entering text:

1. Switch from the superordinate menu to the **Text input** menu.
2. Use the **function keys** to move the cursor to the position of the character to be written first in the input field.
3. Use the **Arrow keys** to highlight the character to be written in the character field.
4. Press the **Enter key**.
   ▷ The highlighted character appears in the input field.
   ▷ The cursor jumps to the next position.

Continue until you have entered the entire text.

5. Press the **OK** function key.
   ▷ The control unit saves the text.
   ▷ The previous menu is displayed.

Overwriting characters:

A single character can be overwritten by another character.

1. Use the **function keys** to move the cursor to the position of the character to be deleted first in the input field.
2. Use the **Arrow keys** to select the character to be written in the character field.
3. Press the **Enter key**.
   ▷ The character is overwritten.
4. To **confirm** the input, press the **OK** function key.
   ▷ The text will be saved to the control unit.
   ▷ The previous menu is displayed.

NOTICE

Individual characters can only be deleted by replacing them with blank spaces (underline at the end of the first 2 character lines).

Deleting an input:

The complete input can be deleted.

1. Press the **C 100 % key**.
   ▷ The complete input is deleted.
2. Enter new text, if necessary.
3. Press the **OK** function key.

4.12.2 Entering values with the cursor keys

In some menus, numerical values can be entered.

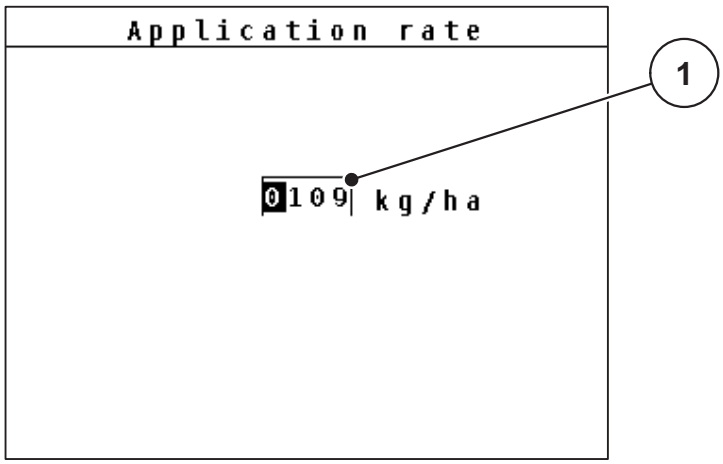


Figure 4.30: Input of numerical value (example application rate)

[1] Input field

Requirements:

You are already in the menu in which you can enter numerical values.

1. Use the **horizontal arrow keys** to move the cursor to the position of the numerical value to be written first in the input field.
2. Use the vertical **arrow keys** to enter the required numerical value.

   Arrow up: Value increases.

   Arrow down: Value decreases.

   Arrow left/right: Cursor moves to the left/right.
3. Press the **Enter key**.

Deleting an input:

The complete input can be deleted.

1. Press the **C 100 %key**.

   ▷ The complete input is deleted.

4.12.3 Creating screenshots

With every software update, data will be overwritten. We recommend always storing your settings as screenshots (screen copy) on a USB stick before implementing a software update.

- Use a USB stick with an illuminated status indicator (LED).

1. Remove the cover from the USB port.
2. Insert the USB stick into the USB port.

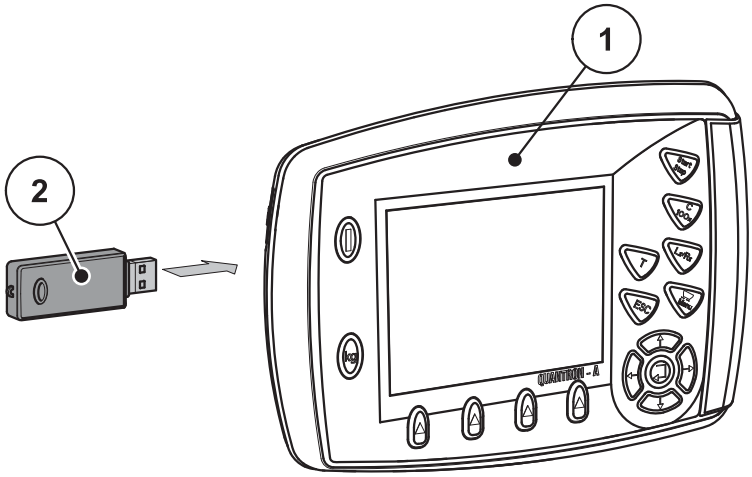


Figure 4.31: Insert USB stick

[1] Control unit
[2] USB stick

3. Open the **Main menu > Fertiliser settings** menu.
   ▷ The first page of the fertiliser settings is displayed.
4. Press the **T** key and the **L%/R%** key **simultaneously**.
   ▷ The status indicator of the USB stick flashes.
   ▷ The control unit beeps twice.
   ▷ An image is stored as bitmap on the USB stick.
5. Store all fertiliser settings pages as screenshots.
6. Open the **Main menu > Machine settings** menu.
   ▷ The first page of the machine settings is displayed.
7. Press the **T** key and the **L%/R%** key **simultaneously**.
   ▷ The status indicator is flashing.
8. Store both pages of the **Machine settings** menu as screenshot.
9. Store all screenshots on your PC.
10. After the software update, open the screenshots and enter the settings in the QUANTRON-A control unit based on the screenshots.

▷ **The QUANTRON-A control unit is ready to operate with its settings.**

5 Spreading operation with the QUANTRON-A control unit

The QUANTRON-A control unit supports setting of the machine before operation. During spreading, functions of the control unit are also active in the background. With these functions, the quality of fertiliser spreading can be monitored.

5.1 Querying the remaining quantity during spreading (AXIS-M 30 EMC + W only)

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

During spreading, i.e. with the slides open, change to the **Rest (kg, ha, m)** menu to display the residual quantity currently in the hopper.

NOTICE

If the values are to be permanently monitored during spreading, freely assignable display fields in the operating screen can also be assigned the **kg rest**, **ha rest** or **m rest** values, refer to chapter 4.9.2: Display configuration, page 68.

Working with the weighed remaining quantity, refilling the hopper:

1. Tare the scales.

   Refer to chapter 4.3.3: Tare scales (AXIS-M 30.1 EMC + W only), page 29.
2. Select the fertiliser type used.

   Refer to chapter 4.5.11: Fertiliser chart, page 44.
3. Fill the hopper.
4. Weigh the fertiliser quantity in the hopper.
5. Start your work.

   If the hopper is empty, refill it.
6. Repeat steps **2** to **5**.

5.2 TELIMAT

⚠ CAUTION

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

By pressing the **T key**, the unit automatically moves to the boundary spreading position by means of an electrical actuating cylinder. This may cause injury and property damage.

▶ Before pressing the **T key**, make sure that no one is in the danger area of the machine.

NOTICE

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

TELIMAT with hydraulic remote control

The TELIMAT is hydraulically moved to its working or idle position. The TELIMAT can be activated or deactivated by pressing the **T 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 of the control unit as soon as the TELIMAT has been hydraulically brought to the operating position. If the TELIMAT is moved back to the idle position, the **TELIMAT icon** is hidden. The sensors monitor the TELIMAT adjustment and activate or deactivate the TELIMAT automatically. The **T key** has no function for this option.

If the status of the TELIMAT unit cannot be verified for more than 5 seconds, **alarm message 14** will be displayed. Refer to chapter 6.1: Meaning of the alarm messages, page 95.

5.3 Working with sections

5.3.1 Spreading with reduced sections

You can spread with sections on one or both sides and thus adapt the entire spreading width to the field requirements. Each spreading side can be adjusted in 4 (VariSpread 8) or 2 (VariSpread 4) steps.

- Press the **L%/R%** key until the desired function keys are displayed.

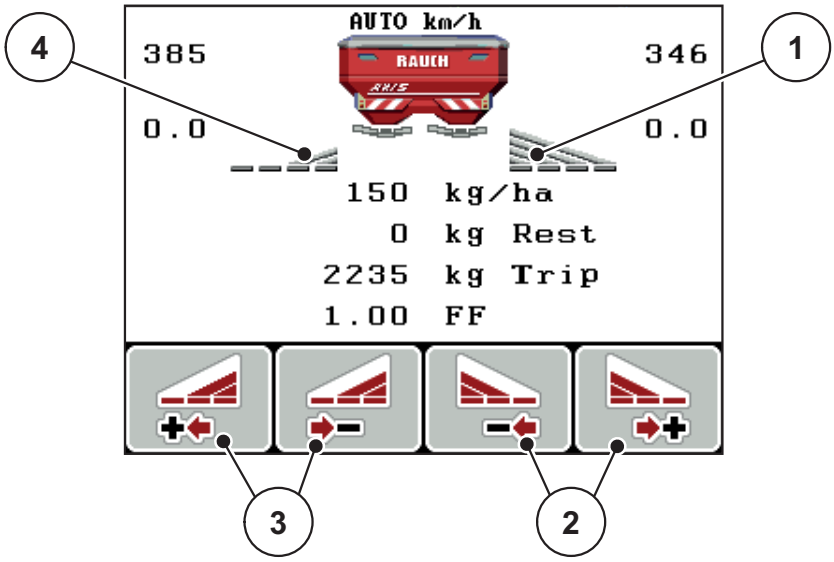


Figure 5.1: Operating screen for spreading operation with sections

[1] Right section will spread to the entire half
[2] Increase or reduce right spreading width function keys
[3] Increase or reduce left spreading width function keys
[4] Left section is reduced to 2 steps

NOTICE

Each section can be gradually reduced or increased in 2 and/or 4 steps.

1. Press the **Reduce left spreading width** function key or the **Reduce right spreading width** function key.
   ▷ The section of the spreading side will be reduced by one step.
2. 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.

NOTICE

The sections are not rated proportionally. You can set the spreading widths via the VariSpread spreading width assistant.

- See 4.5.12: Varispread calculation, page 46.

5.3.2 Spreading operation with one section and in the boundary spreading

During the spreading operation, the sections can be changed gradually and the boundary spreading can be activated. The figure below shows the operating screen with activated limited border spreading and activated sections.

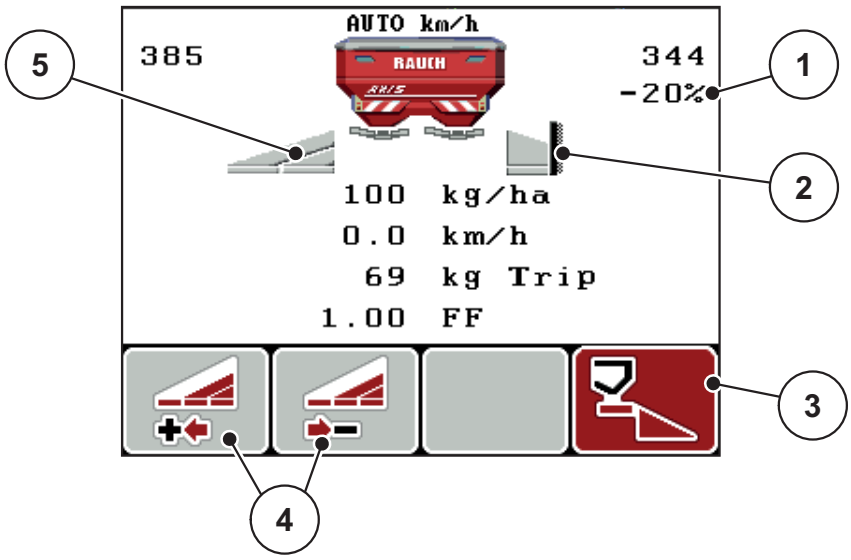


Figure 5.2: Operating screen, one section left, boundary spreading side right

[1] Quantity change in boundary spreading
[2] Spreading side on the right in the boundary spreading
[3] Right spreading side is activated
[4] Reduce or increase left section
[5] Left section adjustable in 2 steps (VariSpread 2)

- The spreading quantity on the left is set to the full working width.
- The **Right boundary spread** function key has been pressed; the boundary spreading function has been activated, and the application rate has been reduced by 20 %.
- Press the **Reduce left spreading width** function key in order to reduce the section by one step.
- By pressing the **C/100%** key, full working width is reapplied immediately.
- For TELIMAT versions without sensor only: By pressing the T key, the boundary spreading is deactivated.

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

Mass flow control with the M EMC function

Mass flow is measured separately on both disc sides. Thus deviations to the specified application rate can be immediately corrected.

The M EMC function requires the following machine data for mass flow control:

- PTO speed
- Spreading disc type

PTO speed between 450 and 650rpm is possible.

- **The desired speed should remain constant during spreading (+/- 10 rpm)**. Thus high control quality can be ensured.
- The empty run measurement is **only** possible if the actual PTO speed deviates by **max. +/- 10 rpm** from the input in the **PTO** menu. Outside of this range, idle measurement is not possible.

Preconditions for spreading:

- The **AUTO km/h + AUTO kg** operating mode is active (refer to 4.6.2: AUTO/MAN mode, page 53).

1. Fill the hopper with fertiliser.
2. Adjusting fertiliser settings:
   - Application rate (kg/ha)
   - Working width (m)
3. Enter the PTO speed in the appropriate menu.

   See also “PTO“ on page -40.
4. Select the disc type used in the appropriate menu.

   See also “Spreading disc type“ on page -40.
5. Switch on PTO.
6. Set PTO to input PTO speed.

   ▷ The **Empty run measurement** screen is displayed.

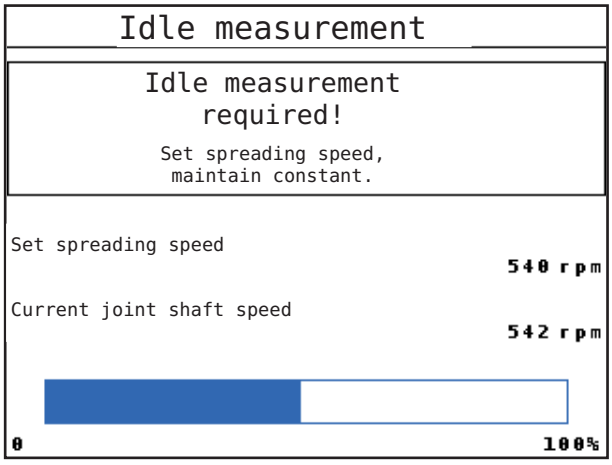


Figure 5.3: Idle measurement information screen

7. Wait until the progress bars have entirely passed through.
   ▷ Idle measurement is finished.
   ▷ Idle time is reset to 20 min.
8. Press the **Start/Stop** key.

▷ **The spreading starts.**

As long as the PTO is operating, a new idle measurement will start after the expiration of the idle time automatically every 20 minutes at the latest.

Under certain conditions, idle measurement to capture new reference data is required before you continue spreading.

As soon as idle measurement during spreading is required, the information screen will appear.

NOTICE

As soon as the metering slides close (e.g. in the headline or by pressing the **Start/Stop** key), the **M EMC function** will start an empty run measurement in the background (without information screen).

- To this end, the PTO speed must remain at the preset value during idle measurement!

NOTICE

If you want to observe the time until the next empty run measurement, you can also assign the freely selectable display fields in the operation screen with **Idle time**, see chapter 4.9.2: Display configuration, page 68.

NOTICE

When starting the disc and after disc type change, a new idle measurement is mandatory!

In case of unusual flow factor changes, the empty run measurement must be started **manually**.

Requirements:

- Spreading work is stopped (Start/Stop key or both sections deactivated).
- The operating screen is displayed.
- The PTO speed is at least 400rpm.

1. Press the **Enter key**.
   ▷ The display shows the idle measurement screen.
   ▷ The idle measurement starts.
2. Adjust the PTO speed, if necessary.

▷ **The bar shows the progress.**

5.5 Spreading with AUTO km/h operating mode

1. Configure the fertiliser settings:
   - Application rate (kg/ha)
   - Work width (m)
2. Fill in the fertiliser.

NOTICE

In order to achieve an optimum spreading result in the AUTO km/h operating mode, a calibration is to be carried out before starting the spreading work.

3. Carry out calibration for flow factor determination

   or

   Obtain the flow factor from the fertiliser chart.
4. Enter the flow factor manually.
5. **Press the Start/Stop** key.

▷ **The spreading starts.**

5.6 Spreading in the MAN km/h operating mode

If there is no speed signal, the MAN km/h operating mode is active.

1. Switch on the QUANTRON-A control unit.
2. Open the **Machine settings > AUTO / MAN mode** menu.
3. Select the **MAN km/h** menu entry.
4. Enter the forward speed.
5. Press **OK**.
6. Configure the fertiliser settings:
   - Application rate (kg/ha)
   - Work width (m)
7. Fill in the fertiliser.

NOTICE

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

8. Carry out calibration for flow factor determination

   or

   Manually enter the flow factor from the fertiliser chart.
9. Press the **Start/Stop** key.

▷ **The spreading starts.**

NOTICE

Always observe the set speed during spreading.

5.7 Spreading in the MAN scale operating mode

The **MAN scale** operating mode enables manual adjustment of the metering slide opening during spreading.

Requirements:

- The metering slides are open (activation with the **Start/Stop key**).
- In the **MAN scale** operating screen, the icons for sections are filled in red.

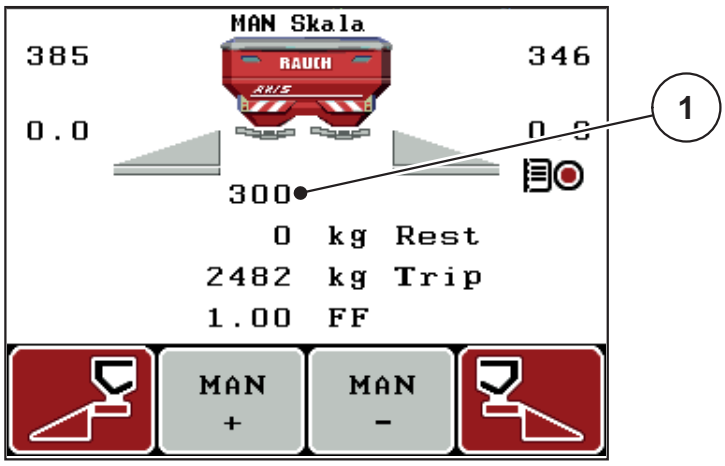


Figure 5.4: MAN scale operating screen

[1] Display of the current scale position of the metering slide

10. To change the dosing slide opening, press the **F2** or **F3** function key.

F2: **MAN+** to increase the metering slide opening or

F3: **MAN-** to reduce the metering slide opening.

NOTICE

In order to achieve an optimum spreading result in manual mode as well, it is recommended to apply the metering slide opening and ground speed values provided in the fertiliser chart.

5.8 GPS Control

The QUANTRON-A control unit can be combined with GPS-compatible devices. Data are exchanged between both devices in order to automate the switching.

NOTICE

We recommend using our QUANTRON-Guide control unit in combination with QUANTRON-A.

- Please contact your distributor for further information.
- Observe the operating manual for QUANTRON-Guide.

The **OptiPoint** function from RAUCH calculates the optimal switching-on and switching-off point for spreading in the headline on the basis of the settings in the control unit; see 4.5.9: Calculate OptiPoint, page 41.

NOTICE

To use the GPS control functions of QUANTRON-A, the serial communication must be activated in the **System/Test > Data transmission** menu via the **GPS Control** sub-menu point.

The symbol **A** next to the spreading wedges indicates that the automatic function is enabled. The control unit opens and closes the individual sections depending on the respective position in the field. The spreading starts only after pressing **Start/Stop**.

⚠ WARNING

Risk of injury due to ejected fertiliser

The GPS Control function starts the spreading operation automatically, without warning. Escaping fertiliser may lead to injury of the eyes and nasal mucous membrane. There is also a risk of slipping.

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

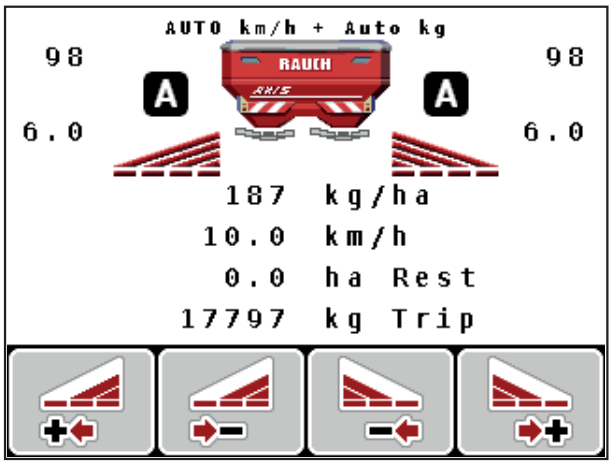


Figure 5.5: Spreading operation display in the operating screen with GPS Control

OPTI driving strategy

The **Driving strategy** refers to the position of the switch-off distance in relation to the headland tracks. Depending on the type of fertiliser, the ideal turn off distance (figure 5.6, [B]) may be close to the field border (figure 5.6, [C]).

In this case, it is no longer possible to turn into the headland track with the tractor and to enter the subsequent field track. The turning procedure must be executed between the headland track and the field border or outside of the field. The fertiliser distribution in the field is ideal.

NOTICE

For the first calculation of OptiPoint, as a rule, select the **OPTI** driving strategy.

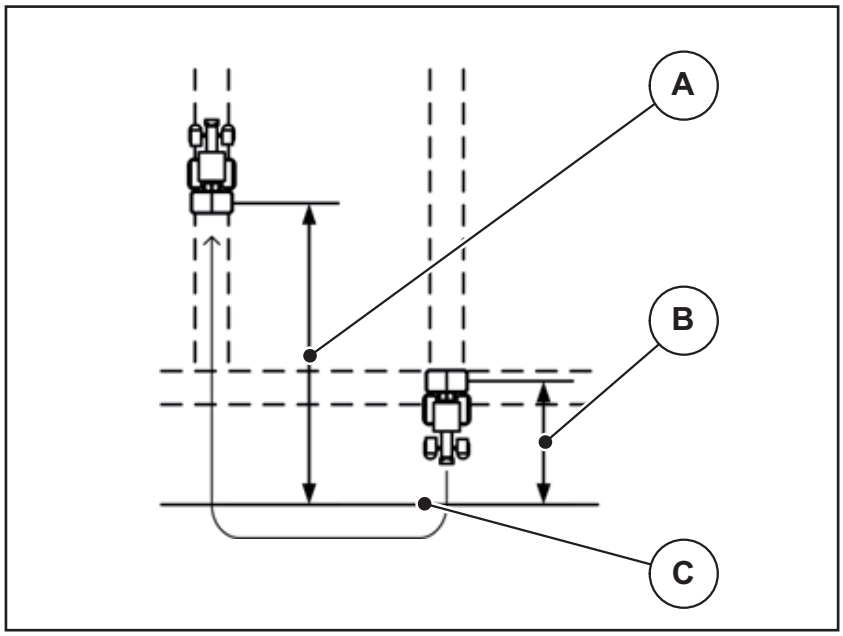


Figure 5.6: OPTI driving strategy

[A] Switch-on distance
[B] Deactivation distance
[C] Field border

Switch-on distance (m)

Switch-on distance refers to the switch-on distance (figure 5.7 [A]) relating to the field border (figure 5.7 [C]). At this position in the field, the metering slides start to open. This distance depends on the type of fertiliser and represents the ideal switch-on distance for optimised fertiliser distribution.

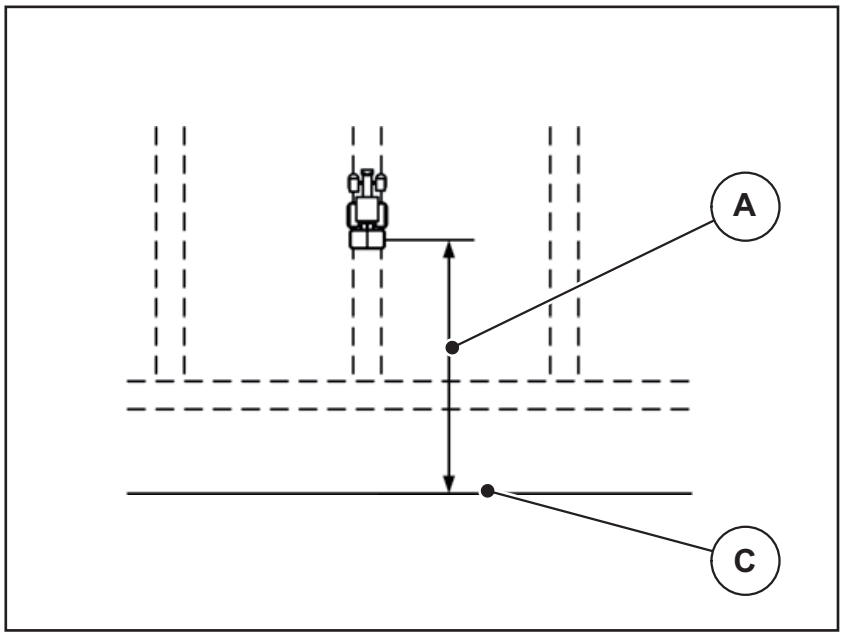


Figure 5.7: Switch-on distance (relating to field border)

[A] Switch-on distance
[C] Field border

If the switch-on position in the field is to be changed, the **switch-on distance** has to be adjusted.

- A lower distance value 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 centre of the field.

Switch-off distance (m)

Switch-off distance refers to the switch-off distance (figure 5.8 [B]) relating to the field border (figure 5.8 [C]). At this position in the field, the metering slides start to close.

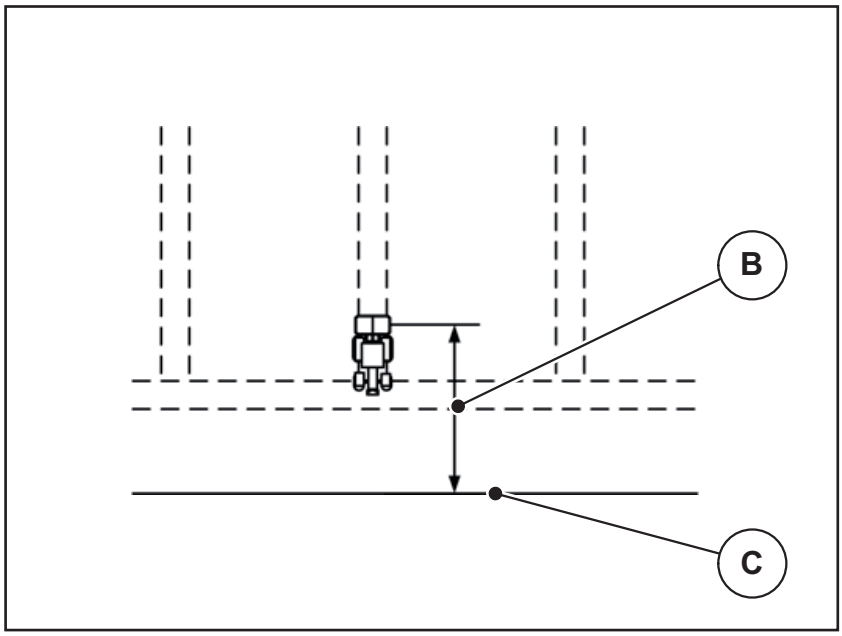


Figure 5.8: Switch-off distance (relating to field border)

[B] Switch-off distance
[C] Field border

If the **OPTI driving strategy** is selected, the optimal turn off distance is calculated according to the type of fertiliser in order to guarantee an optimised fertiliser distribution in the field.

If you wish to turn beyond the headland track, enter a greater distance in **Switch-off distance**.
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 an insufficient fertilisation in the area of the switch off position in the field.

6 Alarm messages and possible causes

The display of the QUANTRON-A control unit may show different alarm messages.

6.1 Meaning of the alarm messages

No.	Message in display	Meaning ● **Possible cause**
1	Fault in dosing system. Stop!	The metering system actuator cannot reach the target value. ● Blockage ● No position feedback
2	Maximum outlet reached! Speed or application rate too high	Metering slide alarm ● The maximum metering opening is reached. ● The set dosing quantity (+/- Quantity) exceeds the maximum metering opening.
3	Flow factor is outside limits.	The flow factor must lie within a range of **0.40 - 1.90**. ● The newly calculated or entered flow factor is outside this range.
4	Hopper left empty.	The level sensor on the left reports "empty". ● The left-hand hopper is empty.
5	Hopper right empty.	The level sensor on the right reports "empty". ● The right-hand hopper is empty.
7	Data will be deleted! Delete = START Cancel = ESC	Safety alarm, to prevent the unintentional deletion of data.
8	Min. quantity (150 kg) not achieved, old factor valid.	Flow factor calculation not possible. ● The application rate is too low to calculate the new flow factor when the remaining quantity is weighed. ● The old flow factor is retained.
9	Application rate Min. setting = 10 Max. setting = 3000	Reference to the value range of the **Application rate** ● Entered value is not permitted.
10	Working width Min. setting = 2.00 Max. setting = 50.00	Reference to the value range of the **Working width**. ● Entered value is not permitted.

No.	Message in display	Meaning ● Possible cause
11	Flow factor Min. setting = 0.40 Max. setting = 1.90	Reference to the value range of the **flow factor**. ● Entered value is not permitted.
12	Transmission fault. No RS232 connection	An error has occurred during data transmission to the control unit. The data have not been transmitted.
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 fertiliser charts can be saved. ● No additional saving possible.
16	Approach drop point Yes = Start	Safety request before drop point is approached automatically. ● The drop point can be set in the **Fertiliser settings** menu. ● Fast emptying.
17	Error by setting drop point.	The actuator for the adjustment of the drop point cannot reach the set value. ● Blockade. ● No position feedback.
18	Drop point blocked	Actuator overloaded.
19	Defect by setting drop point.	Actuator defective.
20	Error on LIN bus participant: [Name].	Communication problem. ● Remove actuator. ● Cable breakage.
21	Spreader overloaded!	The machine is overloaded. ● Too much fertiliser in the hopper
23	Error by setting TELIMAT	The TELIMAT setting actuator cannot reach the target value it is to be moved to. ● Blockade. ● No position feedback.
24	Error by setting TELIMAT	Actuator overloaded.
25	Defect by setting TELIMAT	Defective TELIMAT actuator.

No.	Message in display	Meaning ● Possible cause
32	Externally controlled parts may move. 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.
34	The spreader ist set to reduced disc speed. The idle measurement cannot be started; Confirm this alarm to set the machine back to normal spreading mode.	The flow factor must lie within a range of **0.50 - 1.80**. ● The newly calculated or entered flow factor is outside this range.
36	Weighing quantity impossible. Machine must stop.	Alarm message during weighing. ● The **Weigh quantity** function can only be carried out if the machine is at a standstill and in a horizontal position.
45	Error M-EMC sensors. EMC control deactivated!	The sensor does not send any signals. ● Cable breakage ● Defective sensor
46	Spreading speed error. Observe spreading speed of 450..650 rpm!	The PTO speed is outside the range for the M EMC function.
47	Left dosing error, hopper empty, outflow blocked!	● Hopper empty ● Outlet blocked
48	Right dosing error, hopper empty, outflow blocked!	● Hopper empty ● Outlet blocked
49	Idle measurement implausible. EMC control deactivated!	● Defective sensor ● Defective gearbox
50	Idle measurement impossible. EMC control deactivated!	PTO speed not constant on the long run.
52	Error at hopper cover	Actuator overloaded
53	Defect at hopper cover	Actuator defective
54	Change TELIMAT position	The TEILMAT position does not correspond to the condition notified by GPS Control

6.2 Clearing an error/alarm

6.2.1 Acknowledging an alarm message

Alarm messages are highlighted on the display and displayed with a warning symbol.

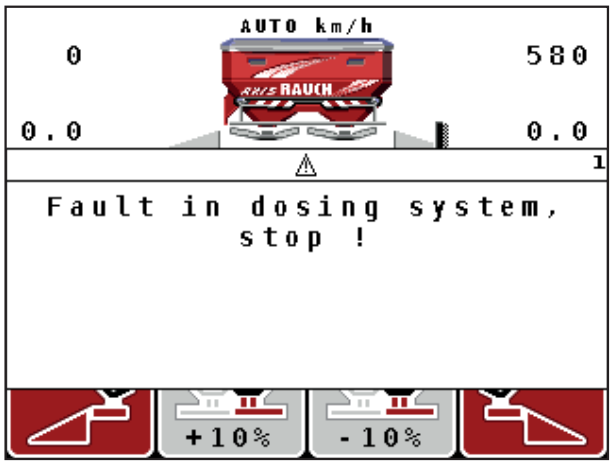


Figure 6.1: Alarm message (e.g. dosing system)

1. Correct the cause of the alarm message.

   Observe the operating manual of the machine and section 6.1: Meaning of the alarm messages, page 95.

2. Press the **C/100 %** key.

▷ **The alarm message is cleared.**

6.2.2 M EMC alarm message

In case of M EMC control, spreading can be continued even if the alarm messages [45] to [50] have been confirmed.

The operating screen displays a warning icon until the M EMC function failure is corrected.

NOTICE

Fertiliser spreading and spreading work to be carried out on your own responsibility.

- Correct the error or the cause for the failure as soon as possible.

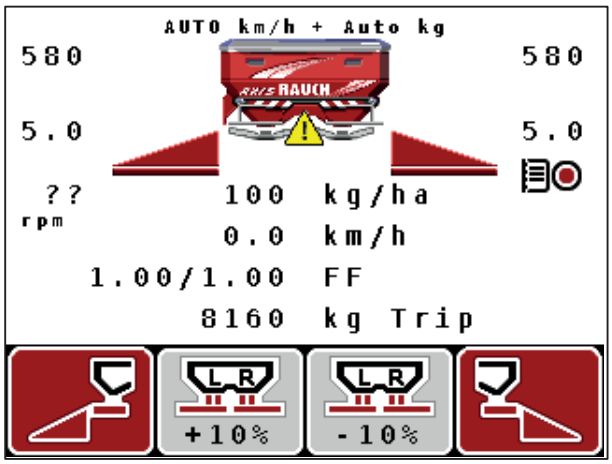


Figure 6.2: M EMC function failure

[1] The display shows a warning triangle until the M EMC function failure is corrected.

7 Optional equipment

No.	Illustration	Designation
1		Level sensor
2		Forward speed sensor
3		Y cable RS232 for data exchange (e.g. GPS, N sensor, etc.)
4		System tractor cable set for QUANTRON-A AXIS 12 m

No.	Illustration	Designation
5		GPS cable and receiver
6		TELIMAT sensor AXIS
7		Universal holder for QUANTRON-A

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Terms/conditions of warranty

RAUCH units are manufactured with modern production methods and with the greatest care and are subject to numerous inspections.

Therefore RAUCH offers a 12-month warranty subject to the following conditions:

- The warranty begins on the date of purchase.
- The warranty covers material and manufacturing faults. Our liability for third-party products (hydraulic system, electronics) is limited to the warranty of the manufacturer of the equipment. During the warranty period, manufacturing and material faults are corrected free of charge by replacement or repair of the affected parts. Other rights extending beyond the above, such as claims for conversion, reduction or replacement for damages that did not occur in the object of supply are explicitly excluded. Warranty services are provided by authorised workshops, by RAUCH factory representatives or the factory.
- The following are excluded from coverage by the warranty: natural wear, dirt, corrosion and all faults caused by improper handing and external causes. The warranty is rendered void if the owner carries out repairs or modifications to the original state of the supplied product. Warranty claims are rendered void if RAUCH original spare parts were not used. Therefore, the directions in the operating manual must be observed. In all cases of doubt contact our sales representatives or the factory directly. Warranty claims must be submitted to the factory by 30 days at the latest after occurrence of the problem. The date of purchase and the serial number must be indicated. If repairs under the warranty are required, they must be carried out by the authorised workshop only after consultation with RAUCH or the company's appointed representatives. The warranty period is not extended by work carried out under warranty. Shipping faults are not factory faults and therefore are not part of the warranty obligation of the manufacturer.
- No claims for compensation for damages that are not part of RAUCH machines themselves will be accepted. This also means that no liability will be accepted for damage resulting from spreading errors. Unauthorised modifications of RAUCH machines may result in consequential damage, for which the manufacturer will not accept any liability. The manufacturer's liability exclusion will not apply in case of wilful 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. It will also not apply in the event that assured properties are absent, if the purpose of the assured properties was to protect the purchaser against damage that does not involve the supplied product itself.

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