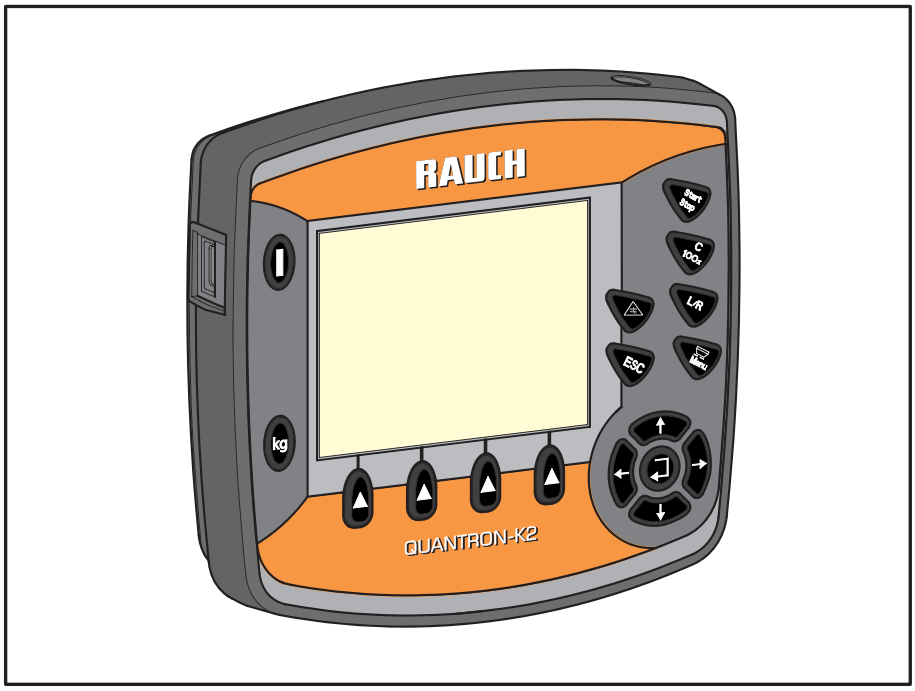
RAUCH

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-K2

Version 2.00.00

Original instructions

5901382-d-en-0120

Preface

Dear Customer,

By purchasing the QUANTRON-K2 control unit for the AXEO winter service 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. However, in case of unexpected problems: Our Customer Service is always ready to help.

We ask you to please read this operating manual and the winter spreader operating manual carefully before commissioning and to observe the instructions contained therein.

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 is not covered by warranty claims.

NOTE

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

The QUANTRON-K2 control unit has been calibrated at the factory for the winter service spreader with which it was supplied. It cannot be connected to another winter service spreader without additional new calibration.

Please state this information when ordering spare parts or special equipment for retrofitting, and in case of complaints:

Serial number of control unit	Serial number Winter service spreader	Year of construction

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 notices

1.1 On this operating manual

This operating manual is **part of** the **QUANTRON-K2** control unit.

The operating manual contains important information for **safe**, **appropriate** 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 complete 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 QUANTRON-K2 control unit.

A quick reference guide is included in the scope of delivery of the QUANTRON-K2 control unit. Please contact us if this is not included in the scope of delivery.

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 supported AXEO versions

- AXEO 2.1 Q
- AXEO 2.1 Q-100
- AXEO 2.1 Q-100 HC

- AXEO 6.1 Q
- AXEO 6.1 Q-100
- AXEO 6.1 Q-100 HC

- AXEO 18.1 Q
- AXEO 18.1 Q-200
- AXEO 18.1 Q-200 HC

2.2 Layout of the control unit - Overview

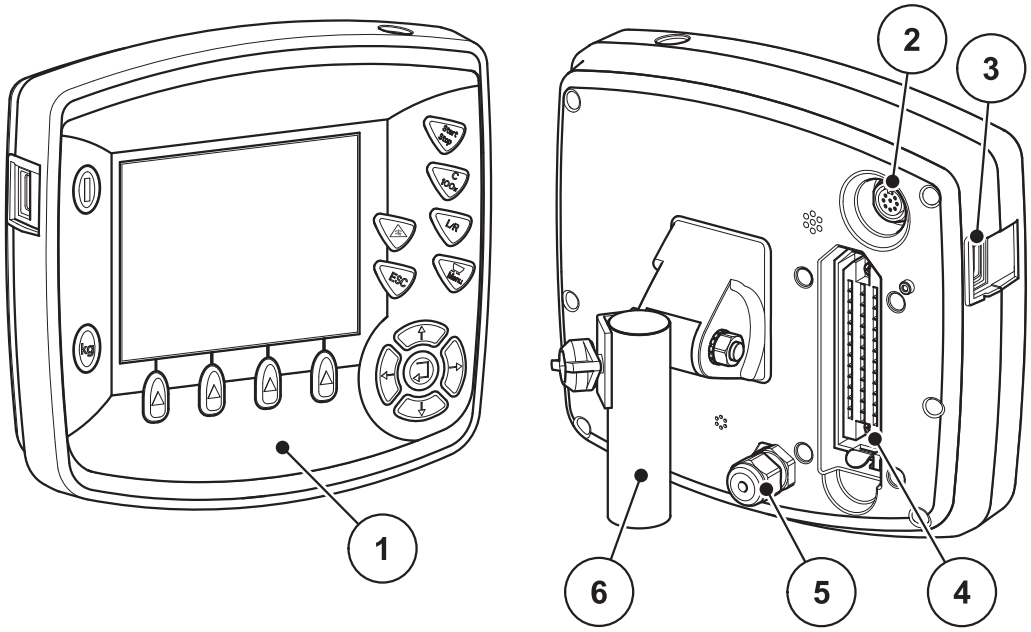


Figure 2.1: control unit QUANTRON-K2

No.	Description	Function
1	Operating panel	Consisting of membrane keys to operate the device and the display for showing the operating screens.
2	V24 data port	Serial interface (RS232) with LH 5000, designed for connecting a Y-RS232 cable for connection to a remote terminal. Plug connector (DIN 9684-1/ISO 11786) for 7-pin to 8-pin cable connection for the speed sensor.
3	USB port with cover	For exchanging data and updating the PC. Cover serves as a protection against contamination.
4	Machine cable plug connector	39-pin plug connector for connecting the machine cable to sensors and actuating cylinders.
5	Power supply	3-pin plug connector for connecting the power supply according to DIN 9680 / ISO 12369.
6	Mounting bracket	Fastens the control unit to the tractor.

2.3 Control elements

The unit is operated via **17 membrane keys** (13 permanently defined and 4 freely configurable membrane keys).

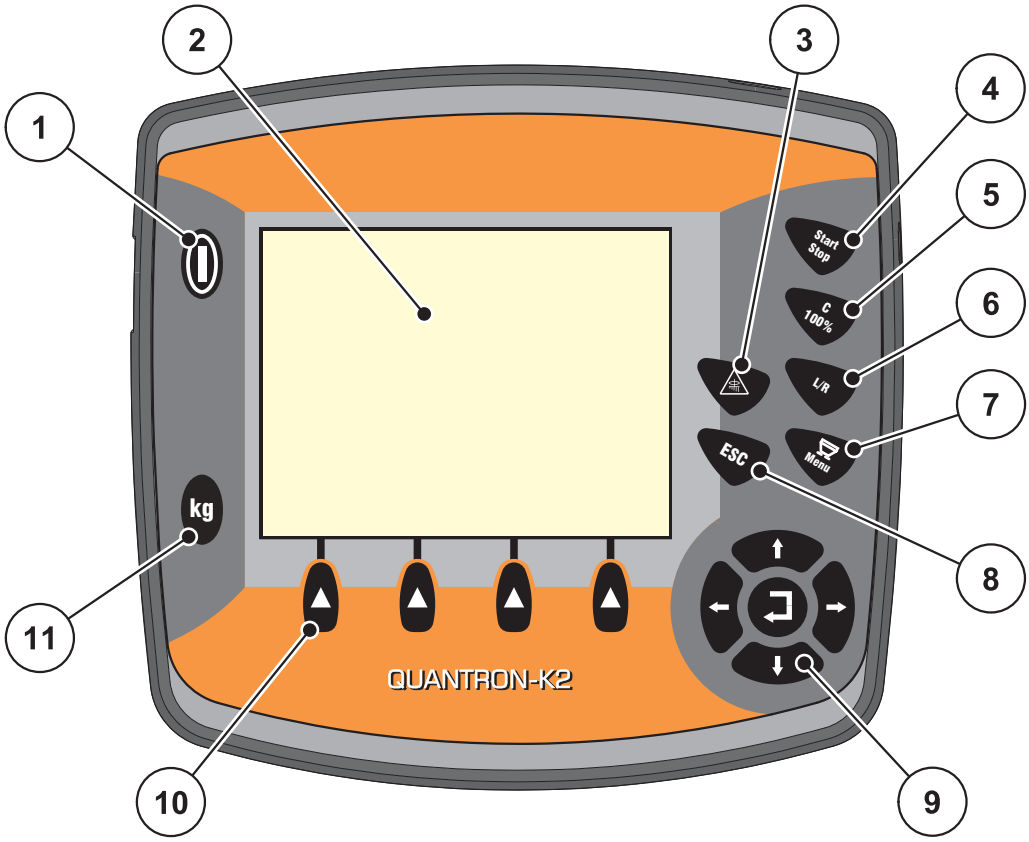


Figure 2.2: Control panel at the front of the unit

NOTICE

The operating manual describes the functions of the control unit QUANTRON-K2 **from software version 2.00.00**.

No.	Description	Function
1	ON/OFF	Switches the device on/off
2	Display	Display of operating screens
3	Special spreading	• For spreading with a pre-set special spreading quantity (percentage value of the additional quantity during normal spreading operation). • For spreading with simulated speed (starting at a crossing).
4	Start/Stop	Start/stop spreading.

No.	Description	Function
5	C/100%	● Clearing an entry in an input field. ● Resetting the excess quantity to 100%. ● Acknowledging alarm messages.
6	L/R	Switching between three adjustment options of the spreading width limiter plates. ● **L**eft ● **R**ight ● **L**eft **+** **R**ight Or, depending on the configuration, adjustment of: ● Working width ● RPM
7	Menu	Switch between operating screen and main menu.
8	ESC	Cancelling entries and/or returning to the previous menu at the same time.
9	Navigation field	4 **arrow keys** and one **enter key** for navigating through the menus and input fields. ● Arrow keys for moving the cursor on the display or for highlighting an input field. ● Enter key to confirm an input.
10	Function keys F1 to F4	Selection of the functions displayed above the function keys.
11	kg	● Display of the remaining quantity in the hopper. ● Trip counter ● kg rest ● Meter counter

2.4 Display

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

The most important information on the operation of the winter service spreader is displayed in the **operating screen**.

Description of the operating screen

NOTICE

The exact representation of the operating screen depends on the currently selected settings, see 4.10.2: Display configuration, page 59.

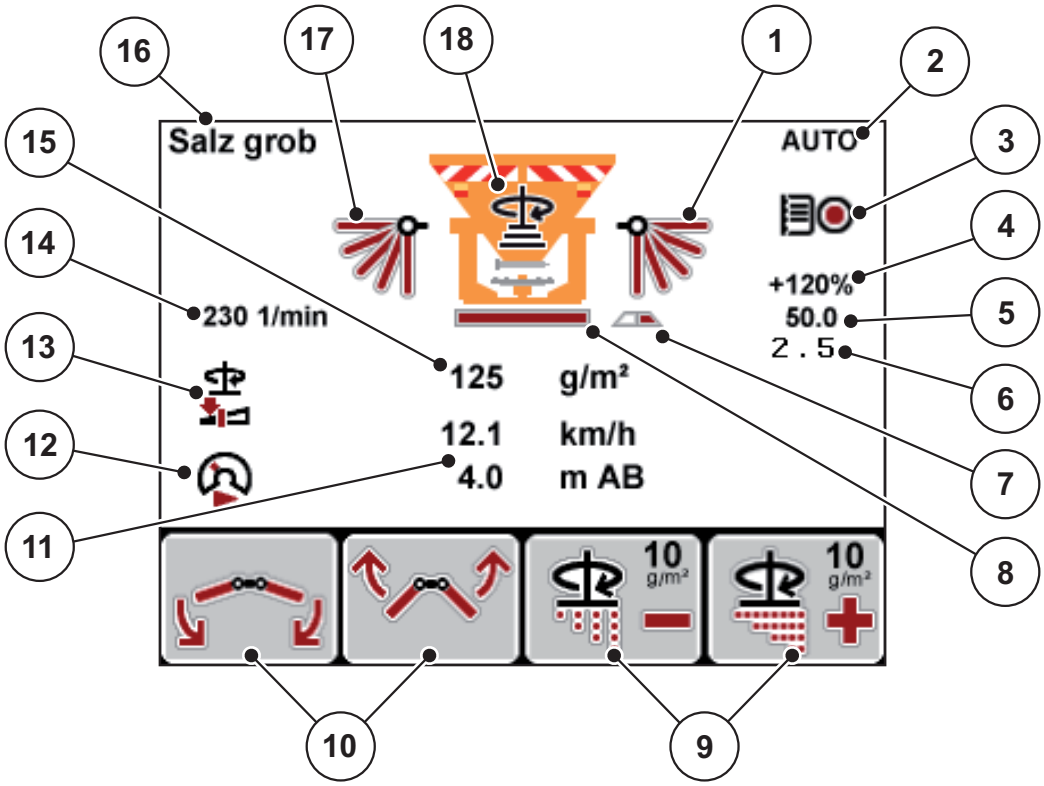


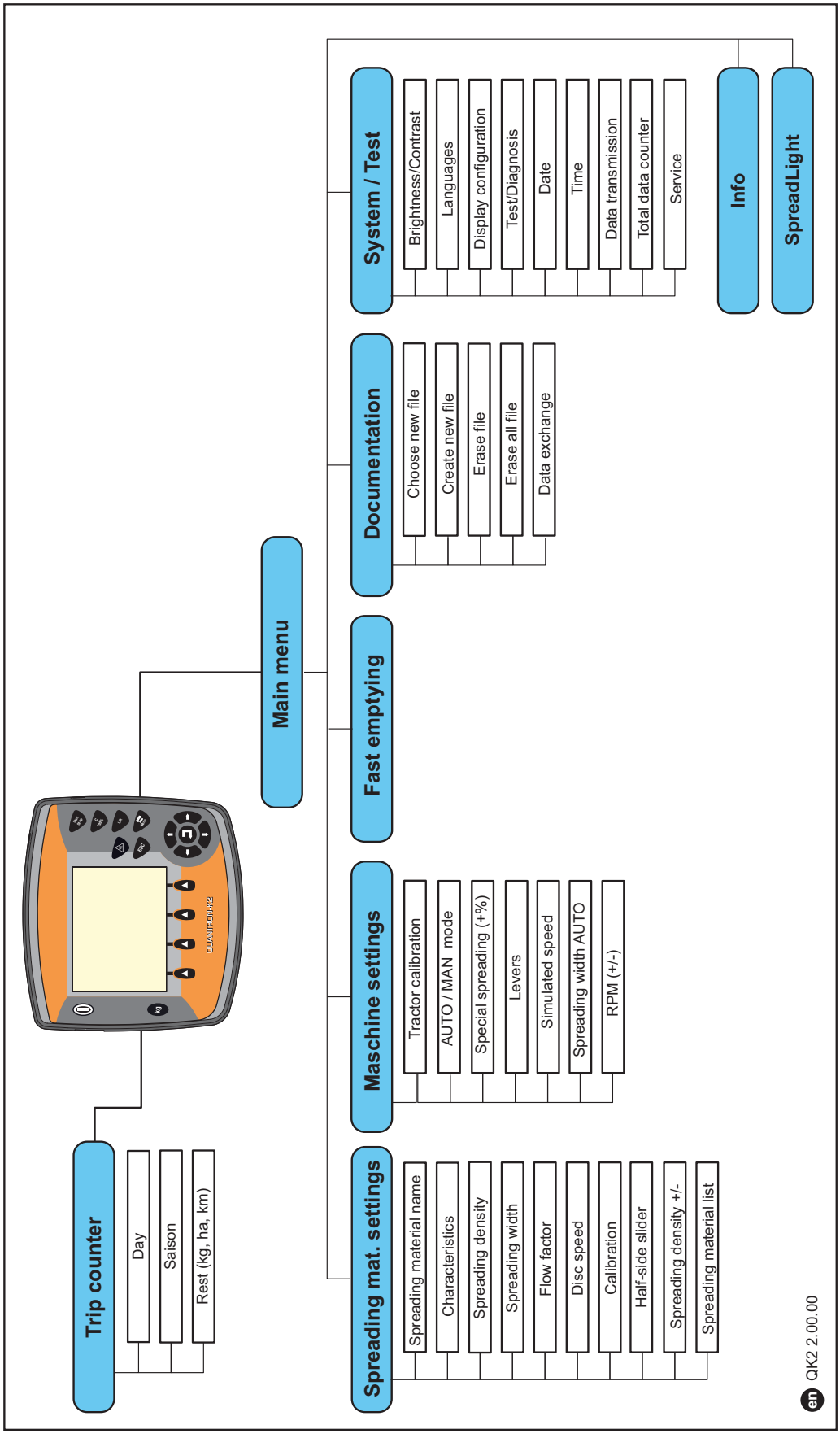
Figure 2.3: Control unit display (example)

The symbols and displays in the example have the following meanings:

No.	Symbol/Display	Meaning (in the example shown)
1	Position of the right spreading width limiter plate	Current opening position of the **right** spreading width limiter plate, subdivided into 5 positions.
2	Operating mode	Display of the set operating mode (MAN scale, MAN km/h, AUTO)
3	Documentation	The symbol is displayed if Documentation is running.
4	Additional quantity, Special spreading	While pressing the **special spreading** key (see Figure 2.2), the additional percentage quantity indicated here is spread.
5	Metering slide position	Display of the metering slide position in a range of **0** to **56**.
6	Half-side slide position	Display of the half-side slide position in a range of **0.0** to **5.0**.
7	Half-side slide open/closed	The symbol is displayed when the half-side slide is not in the open position.
8	Metering slide open/closed	The frame is filled in **red** when the metering slide opens.
9	Spreading density adjustment	Adjustment of the spreading density up (**+**) and down (**-**).
10	Spreading pattern adjustment	Adjustment of the spreading width limiter plates in 5 steps. Depending on the configuration, the following adjustment options are available: ● **Right** only ● **Left** only ● **Right** and **Left** together Or, depending on the configuration, adjustment of: ● Working width ● RPM
11	Display fields	Individually configurable display fields; here, spreading width and speed. ● Possible configuration: see chapter 4.10.2: Display configuration, page 59.
12	Simulated speed	The symbol indicates that the simulated speed is active.
13	Minimum mass flow	Warning during spreading: The spreader is working independently of the configured spreading density using the minimum mass flow of **5 kg/min**.
14	Spreading disc speed	In the **HydroControl** version, the symbol shows the current spreading disc speed.

No.	Symbol/Display	Meaning (in the example shown)
15	Spreading density	Shows the currently set spreading density in grams per square metre (**g/m^2**).
16	Spreading material	Display of the set spreading material. The display is limited to 10 characters.
17	Position of the left spreading width limiter plate	Current opening position of the **left** spreading width limiter plate, subdivided into 5 positions.
18	Operational conditions symbol	The symbol is displayed when the Single-disc spreader is operational.

2.5 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.

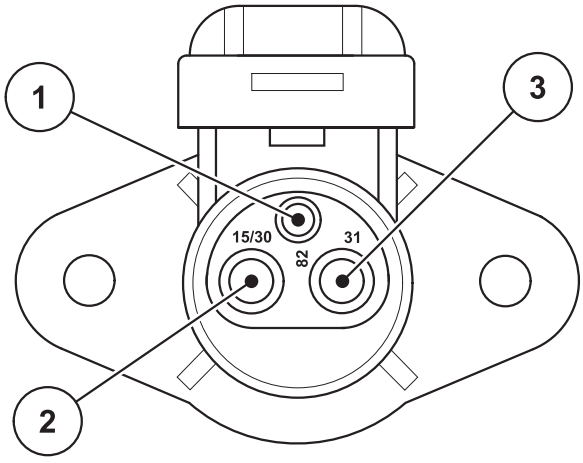
NOTICE

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).

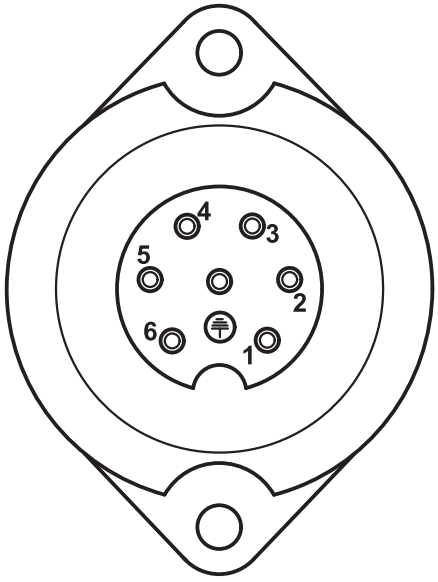


[1] PIN 1: not required
[2] PIN 2: (15/30): +12 V
[3] PIN 3: (31): mass

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. gear-box, wheel sensor)

Figure 3.2: PIN assignment for 7-pin plug connector

3.3 Connecting the control unit

NOTICE

Note machine number!

The QUANTRON-K2 Control unit has been calibrated at the factory for the winter service spreader with which it was supplied.

Connect the Control unit to the correct winter service spreader only.

Depending on the equipment, there are different methods of attaching the Control unit to the winter service spreader. Schematic connection diagrams are provided:

- For the standard connection on page 16.
- For the connection with the wheel sensor on page 17.
- For the connection with the wheel sensor and machine cable on page 18.

Perform the work steps in the following order.

- Select a suitable position in the tractor cabin (within **the driver's field of vision**) where you want to attach the Control unit.
- Attach the Control unit using the **mounting bracket** 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:

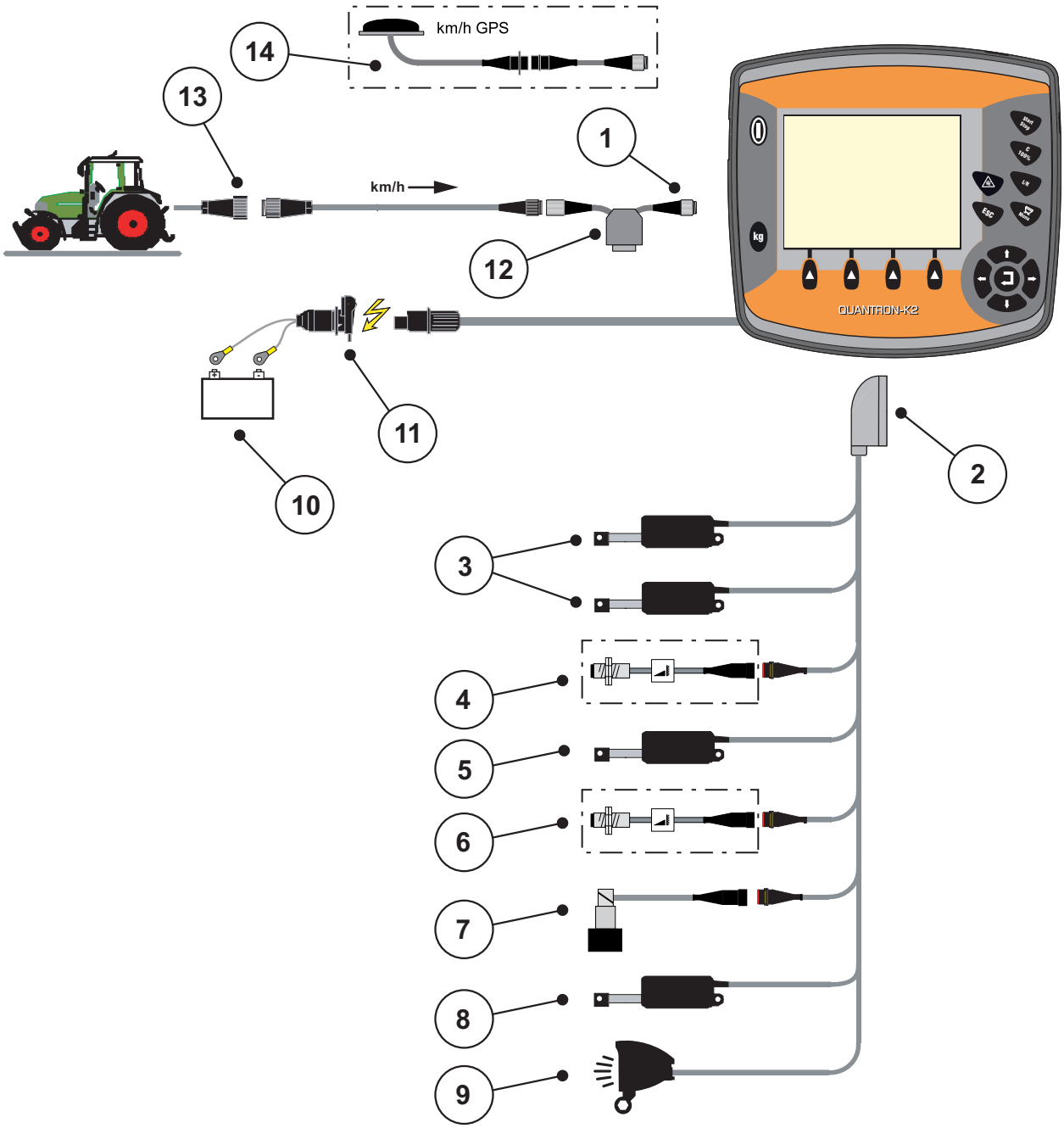


Figure 3.3: Schematic connection diagram QUANTRON-K2 (standard)

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine connector
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (HydroControl option)
[7] Proportional valve (HydroControl option)
[8] Half-side slide actuator
[9] SpreadLight (option)
[10] Battery
[11] 3-pin plug connector according to DIN 9680 / ISO 12369
[12] Y-cable option (V24 RS232 interface for storage medium)
[13] 7-pin plug connector according to DIN 9684
[14] Option (GPS cable and receiver)

Schematic connection diagram for wheel sensor:

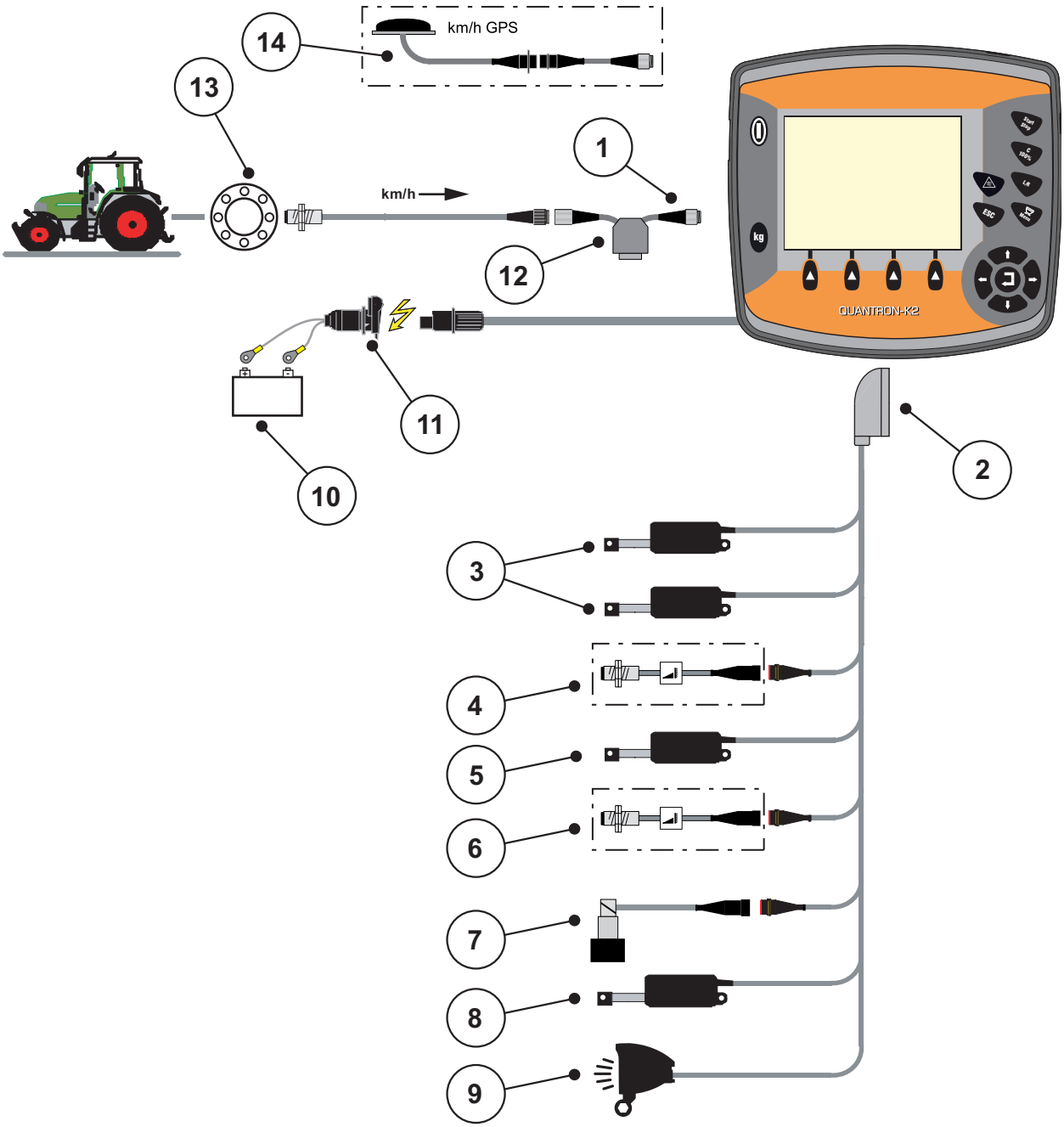


Figure 3.4: Schematic connection diagram QUANTRON-K2 (wheel sensor)

[1] Serial interface RS232, 8-pin plug connector
[2] Spreading width limiter actuators
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (HydroControl option)
[7] Proportional valve (HydroControl option)
[8] Half-side slide actuator
[9] SpreadLight (option)
[10] Battery
[11] 3-pin plug connector according 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 overview: Power supply via ignition lock

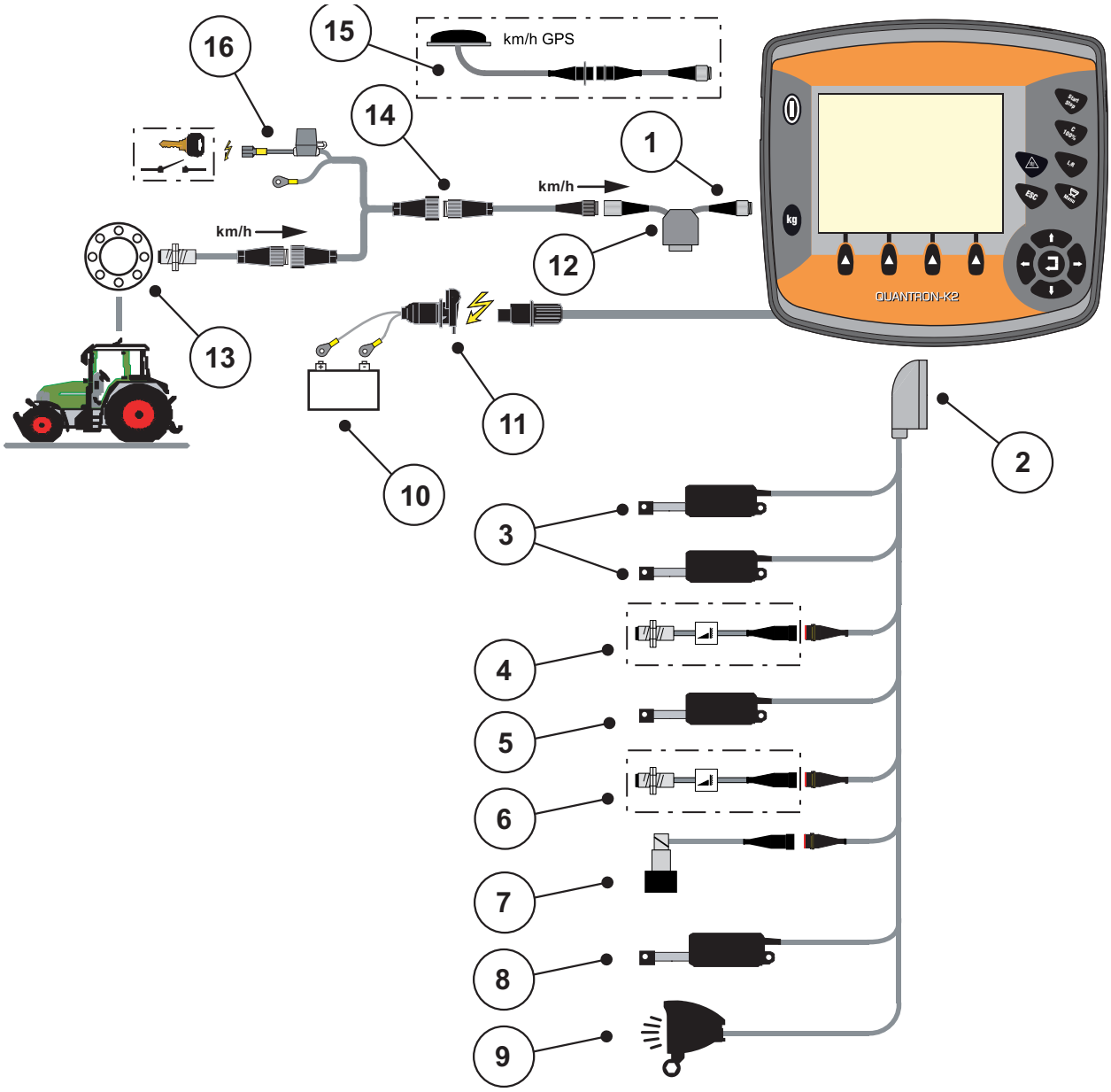


Figure 3.5: Schematic connection diagram QUANTRON-K2 (power supply via ignition lock)

[1] Serial interface RS232, 8-pin plug connector
[2] 39-pin machine connector
[3] Spreading width limiter actuators (EFQ-GT or EFG-GE option)
[4] Half-side slide sensor
[5] Metering slide actuator
[6] Spreading disc speed sensor (HydroControl option)
[7] Proportional valve (HydroControl option)
[8] Half-side slide actuator
[9] SpreadLight (option)
[10] Battery
[11] 3-pin plug connector according to DIN 9680 / ISO 12369
[12] Option: Y-cable (V24 RS232 interface for storage medium)
[13] Forward speed sensor
[14] 7-pin plug connector according to DIN 9684
[15] Option: GPS cable and receiver
[16] Option: QUANTRON-K2 power supply via ignition lock

3.4 Preparation of metering slide

The AXEO Q winter service spreader is fitted with an electric metering slide actuator for setting the spreading volume.

⚠ CAUTION

Observing the metering slide position

Operation of the actuator by means of the QUANTRON-K2 may damage the metering slide of the AXEO Q winter service spreader if the end stop is positioned incorrectly.

▶ Always clamp the end stop at the maximum scale position.

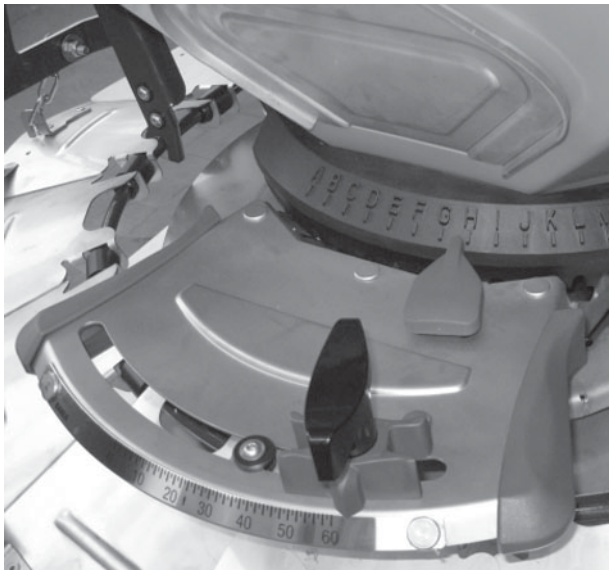


Figure 3.6: Metering slide preparation (example)

NOTICE

Observe the operating manual of the fertiliser spreader.

4 Operation QUANTRON-K2

⚠ CAUTION

Risk of injury due to ejected spreading material

In the event of a fault, the metering slide may open unexpectedly when driving to the spreading location. There is a danger of slipping and injury to persons due to ejected spreading material.

▶ **Before driving to the spreading location,** be sure to always switch off the electronic control unit QUANTRON-K2.

4.1 Switching on the control unit

Prerequisites:

- The control unit is connected correctly to the winter service spreader and the tractor (for an example, see chapter 3.3: Connecting the control unit, page 15).
- A minimum voltage of **11 V** is guaranteed.

NOTICE

The operating manual describes the functions of the control unit QUANTRON-K2 **from software version 2.00.00**.

Switch on:

- Actuate the **ON/OFF switch**.
  - ▷ After a few seconds, the **start-up screen** of the control unit appears.
  - ▷ Shortly after, the control unit displays the **Activation menu**.
- Press the **Enter key**.
  - ▷ The **Start diagnostics** screen is then displayed for a few seconds.
  - ▷ Subsequently, the **operating screen** appears.

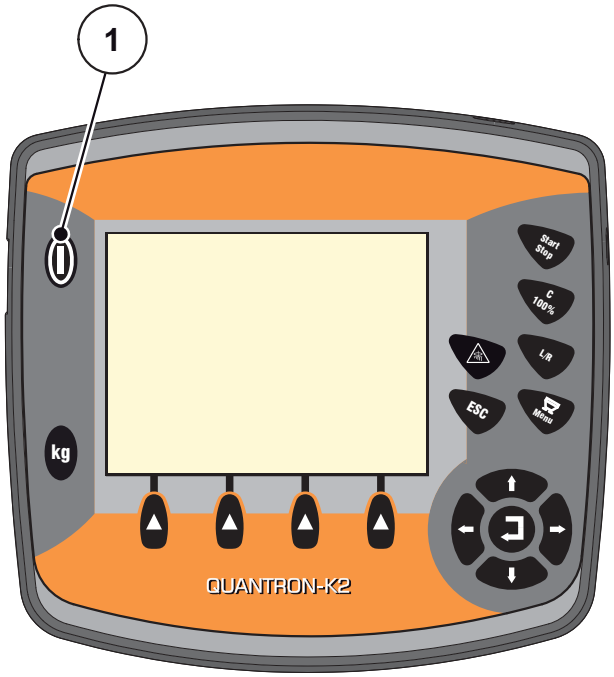


Figure 4.1: Start QUANTRON-K2

[1] ON/OFF switch

4.2 Navigation within the menus

NOTICE

Important notes regarding the display and the navigation between menus are provided in chapter 1.2.5: Menu hierarchy, keys and navigation, page 3.

Accessing the main menu

- Press the **menu key**. See 2.3: Control elements, page 7.
  - ▷ The main menu appears on the display.
  - ▷ The black bar indicates the first submenu.

NOTICE

Not all parameters are displayed simultaneously in one menu window. With the **arrow keys** you can jump to the adjacent window.

Accessing the submenu:

1. Move the bar up and down with the **arrow keys**.
2. Highlight the desired submenu with the bar on the display.
3. Access the highlighted submenu by pressing the **Enter key**.

Windows appear prompting to perform various actions.

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

Quitting the menu

- Confirm settings by pressing the **Enter key**.
  - ▷ You return to the **previous menu**.

  or
- press the ESC key.
  - ▷ The previous settings are retained.
  - ▷ You return to the **previous menu**.
- Press the **menu key**.
  - ▷ This returns you to the **operating screen**.
  - ▷ Pressing the **menu key** once more returns you to the menu that you just exited

4.3 Trip counter

This menu provides values on the spreading work carried out.

- Press the **kg** key at the control unit.
  ▷ The **Trip counter** menu appears.

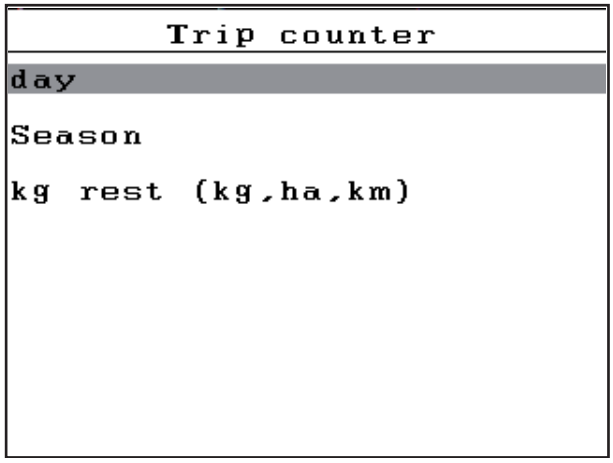


Figure 4.2: Trip counter menu

Submenu	Meaning	Description
Day	Display of the daily values in spreading operation.	Page 25
Season	Display of the season values in spreading operation.	
Rest (kg, ha, km)	Display of the spreading area and distance possible with the remaining quantity.	Page 26

4.3.1 Day/Season

In these menus you can query various values (quantity, distance, area) of the spreading work performed in the corresponding period **Day** and **Season**.

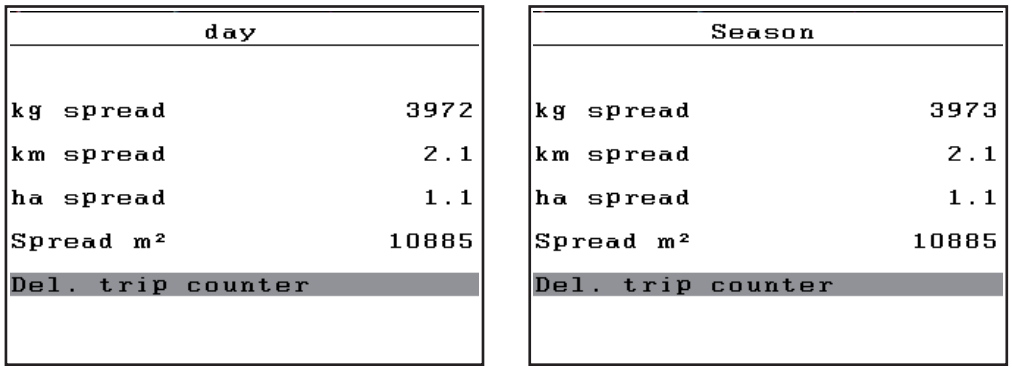


Figure 4.3: Day and Season menu

Clearing the trip counter:

1. Call up the **Day** or **Season** menu.
   ▷ The **Del. trip counter** field is highlighted in the display.
2. Press the **Enter key**.
   ▷ All values of the trip counter are reset to **0**.
3. Press the **kg** key.
   ▷ This returns you to the operating screen.

Checking the trip counter during spreading:

During the spreading work (with the slides open) you can change to the **Trip counter menu** and to read current values.

NOTICE

If you wish to continuously observe the values during the spreading work, you may also assign the freely selectable display fields on the operating screen with **kg Trip, km Trip** or **ha Trip**, see chapter 4.10.2: Display configuration, page 59.

4.3.2 Showing the remaining quantity

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

- Spreading material settings:
  - Spreading density (g/m^2)
  - Spreading width (m)

NOTICE

The calculation of the remaining quantity depends on the spreading material and the machine settings as well as the drive signal. The filling quantity must be entered **manually**.

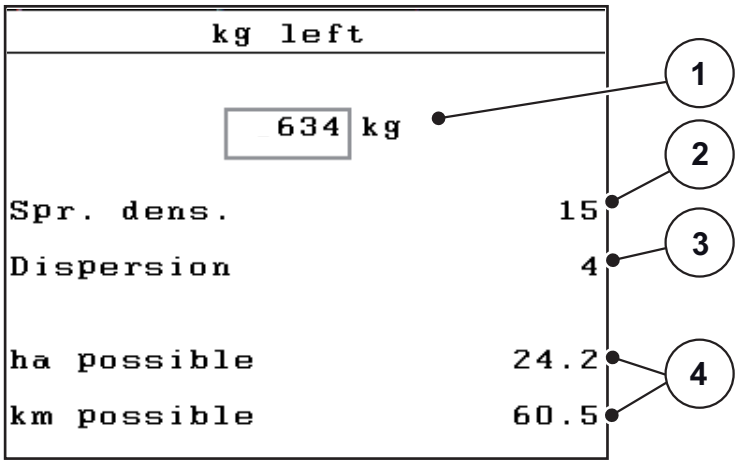


Figure 4.4: Rest menu (kg, ha, km)

[1] Remaining quantity input field
[2] Spreading density (display field from the spreading material settings menu)
[3] Working width (display field from the spreading material settings menu)
[4] Display of the possible area and distance that can be spread with the remaining quantity

Entering the remaining quantity when refilling:

1. Call up the **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 spreading material in the hopper.
   See also chapter 4.11.2: Input of values using the cursor keys, page 65.
4. Confirm input by pressing the **Enter key**.
   ▷ The device calculates the values for the possible spreading area and the possible spread distance.

NOTICE

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

5. Press the **kg** key.

▷ **This returns you to the operating screen.**

Calling up the remaining quantity during spreading:

During spreading, the remaining quantity is continuously recalculated and displayed. See chapter 5: Spreading operation using the QUANTRON-K2 Control unit, page 67.

4.4 Main menu

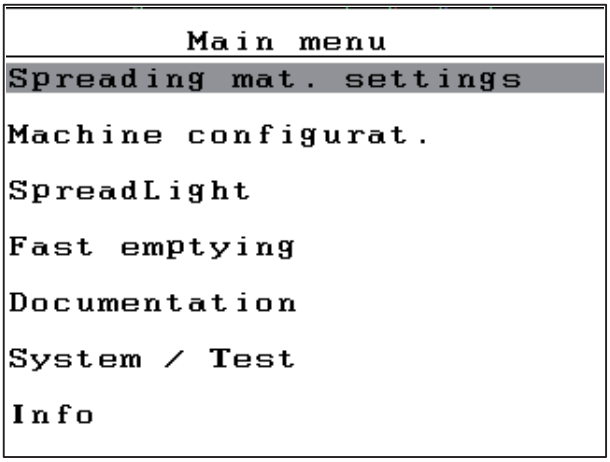


Figure 4.5: Main menu QUANTRON-K2

The main menu offers the following sub-menus.

Submenu	Meaning	Description
Spreading material settings	Settings for spreading material and spreading operation.	Page 29
Machine configuration	Settings for tractor and winter service spreader.	Page 42
SpreadLight	SpreadLight settings	Page 50
Fast emptying	Direct access to the menu for fast emptying of the winter spreader.	Page 52
Documentation	● Import and export of files between PC and control unit ● Opens the menu for selecting, creating or deleting a documentation.	Page 53
System / Test	Settings and diagnosis of the control unit.	Page 57
Info	Display of the serial number of the spreader, software version, hardware version and settings in the control unit	Page 62

4.5 Spreading material settings

You can adjust the settings for spreading material and spreading operation in this menu.

- Call up the **Main menu > Spreading mat. settings** menu.

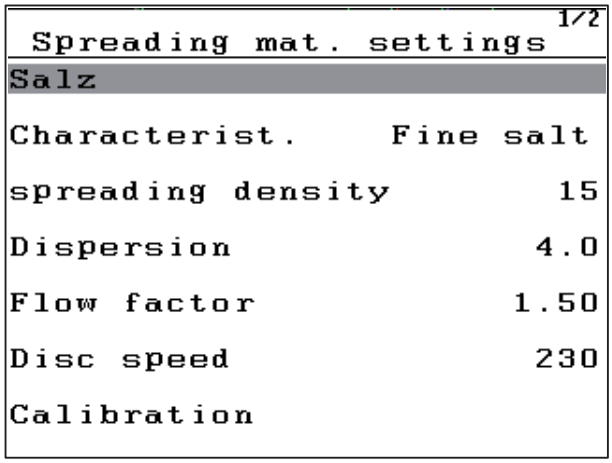


Figure 4.6: Spreading mat. settings menu, page 1

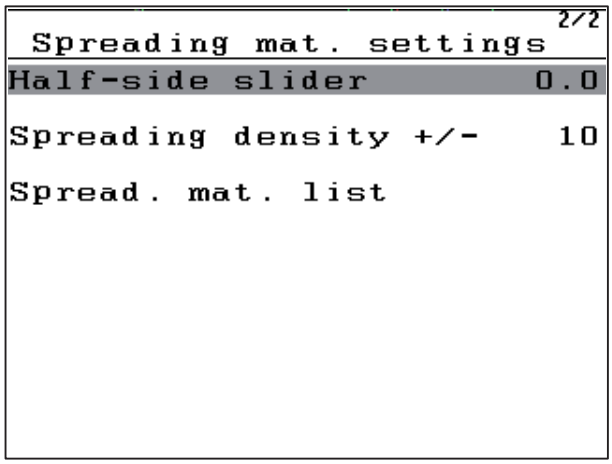


Figure 4.7: Spreading mat. settings menu, page 2

NOTICE

The **Disc speed** submenu appears in the display **only** when the **HydroControl** option is activated. See 4.5.4: Disc speed (HydroControl option), page 34.

Submenu	Meaning/possible values	Description
Spreading material name	Manually entering the name of a new spreading material.	
Characteristic curve	Selection of one of six spreading materials or spreading material types for determining the mass flow characteristic: ● Fine salt ● Coarse salt ● Damp salt ● Sand ● Grit ● Fertiliser	
Spreading density	Entering of the spreading density based on the pre-selected characteristic curve.	
Spreading width	Entry of the spreading width (working width).	Page 32
Flow factor	Entry of the flow factor for the spreading material used.	Page 33
Disc speed	Selection of the disc speed.	Page 34
Calibration	Execution of the calibration and new calculation of the flow factor.	Page 35
Half-side slide	Entry of the positioning values for the half-side slide.	Page 38
Spreading density +/-	Specification of the step size by which the spreading density can be manually increased or decreased later.	Page 39
Spreading material list	Management of fertiliser charts.	Page 40

4.5.1 Spreading density

In the **Spreading density** submenu, you can enter the desired spreading density for the spreading material to be spread.

1. Call up the **Spreading mat. settings > Spreading density** submenu.
   ▷ The display shows the **currently applied** spreading density.
2. Enter the new value in the input field using the **arrow keys**:
   See also 4.11.2: Input of values using the cursor keys, page 65.

Spreading material (characteristics)	Spreading density (g/m²)
Salt, coarse/fine (damp)	5-40
Sand, grit (blunting)	75-300
Fertiliser	1-300

3. Confirm input by pressing the **Enter key**.

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

▷ **The display shows the Spreading mat. settings menu.**

NOTICE

The programmed ranges are **orientation values only**. The spreading density can be adapted to individual requirements.

If a value outside the range is entered, an alarm message is displayed.

- Press the **C/100%** key: the entered value is saved.

4.5.2 Spreading width

NOTICE

The **Spreading width** can only have a value between **1** and **10 metres**.

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

1. Call up the **Spreading mat. settings > Spreading width** menu.
   ▷ The display shows the **currently set** spreading width.
2. Enter the new value in the input field.
   See chapter 4.11.2: Input of values using the cursor keys, page 65.
3. Confirm input by pressing the **Enter key**.

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

NOTICE

When the **Dispersion AUTO** function is **active**, the following values are automatically adjusted when the spreading width is changed:

- Spreading width limitation
- Metering slide position
- Half-side slide position
- Disc speed (**only for the HydroControl version**).

When the **Dispersion AUTO** function is **deactivated**, you must manually enter the values in the respective menus.

4.5.3 Flow factor

The flow factor is within the range of **0.4** to **2.10**. At identical basic settings (km/h, working width, kg/ha), the following applies:

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

If you know the flow factor from earlier calibrations or from the fertiliser chart, you can enter it **manually** in this menu.

NOTICE

Via the **Calibration** menu, the flow factor can be determined and entered using the QUANTRON-K2. See chapter 4.5.5: Calibration, page 35

NOTICE

The flow factor calculation depends on the operating mode used. For further information on the flow factor is provided in chapter 4.6.2: AUTO / MAN mode, page 46.

Entering the flow factor:

1. Call up the **Spreading mat. settings > Flow factor** menu.
   ▷ The display shows the **currently applied** flow factor.
2. Enter the new value in the input field.
   See chapter 4.11.2: Input of values using the cursor keys, page 65.

NOTICE

If your spreading material is not listed in the fertiliser chart, enter a flow factor of **1.00**.

In the **AUTO km/h operating mode** we highly recommend executing a **calibration** in order to be able to accurately determine the flow factor for this spreading material.

3. Confirm input by pressing the **Enter key**.

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

4.5.4 Disc speed (HydroControl option)

You can enter the desired disc speed in the **Disc speed** submenu.

NOTICE

When the **Dispersion AUTO** function is **active**, the QUANTRON-K2 control unit determines the disc speed depending on the selected spreading material and working width.

When the **Dispersion AUTO** function is **deactivated**, you must manually enter the disc speed.

- See 5.2.5: Adjusting the spreading width with the Dispersion AUTO function and actuator for the half-side slide, page 76
- See 5.10: Disc speed adjustment (HydroControl only), page 83

1. Call up the **Spreading mat. settings > Disc speed** submenu.
   ▷ The display shows the **currently applied** disc speed.
2. Enter a new value.
3. Press the **Enter key**.

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

▷ **The display shows the Spreading mat. settings menu.**

NOTICE

Enter a speed of at least **150 rpm** to ensure sufficiently accurate spreading work.

4.5.5 Calibration

In this menu, the flow factor is determined based on a calibration test and saved in the control unit.

⚠ WARNING

Risk of injury when performing the calibration

Rotating machine components, the moving spreading width limiter and ejected spreading material can cause injuries.

- ▶ Ensure that all preconditions are been met.**before starting, when interrupting and when finishing** calibration.
- ▶ Observe the **Calibration** chapter in the operating manual of the Single-disc spreader.

Perform the calibration:

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

Perform the calibration test with a running agitator and stationary machine **or** while driving a test track.

- Place a collection container (tray, foil, etc.) on the ground under the Single-disc spreader.

Entering the working speed:

1. Call up the **Spreading mat. settings > Calibration** menu.
2. Enter the average working speed.

   This value is required to calculate the metering slide position during the calibration.
3. Press the **Enter key**.
   - ▷ The new value is saved in the control unit.
   - ▷ The **Calibration test** operating screen is shown on the display.

Running the calibration:

NOTICE

HydroControl option: After pressing the **Start/Stop** key, an alarm window appears.

- Press the **Enter key** to activate the disc start.

4. Press **Start/Stop** (also press the Enter key for HydroControl).
   - ▷ The metering slide opens and calibration is started.
   - ▷ **HydroControl** option: Agitator and spreading disc are started.

NOTICE

The calibration can be stopped at any time by pressing the **ESC** key. The metering slide closes and the display shows the **Spreading mat. settings** menu.

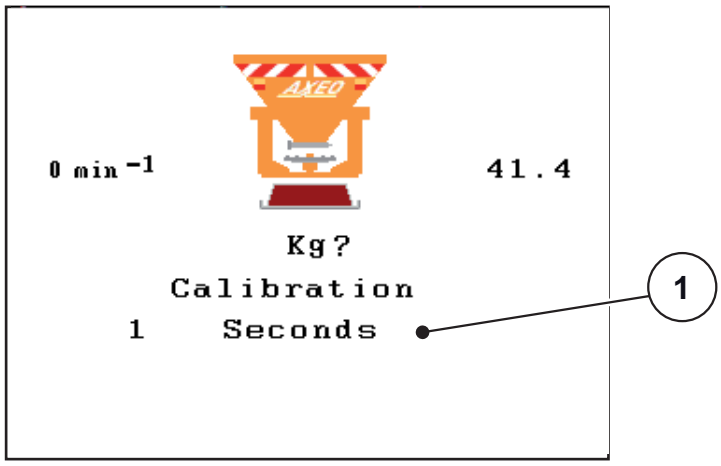


Figure 4.8: Run calibration operating screen

[1] Display of elapsed time since starting the calibration

NOTICE

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

5. Press the **Start/Stop** key again.
   - ▷ The calibration is ended.
   - ▷ The metering slide closes.
   - ▷ **HydroControl** option: Agitator and spreading disc are stopped.
   - ▷ 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 (agitator, spreading disc) may cause bruises, abrasions and crushing injuries. Body parts or objects may be caught or pulled in.

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

6. Weigh the collected weight (taking into account the empty weight of the collecting vessel).

7. Enter the collected weight.

   See chapter 4.11.2: Input of values using the cursor keys, page 65.

8. Press the **Enter key**.

   ▷ The new value is saved in the control unit.

   ▷ The display shows the **Flow factor calculation** menu.

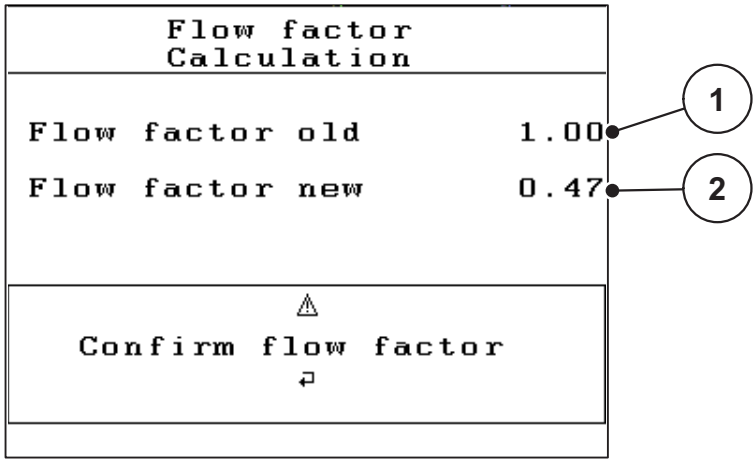


Figure 4.9: Flow factor calculation window

[1] Display of the previously saved flow factor
[2] Display of the newly calculated flow factor

NOTICE

The flow factor must be between 0.4 and 2.1.

9. Define the flow factor.

   For accepting 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 display shows the Spreading mat. settings menu.**

4.5.6 Half-side slide

If the **Dispersion AUTO function is deactivated**, you can manually enter the value for positioning the half-side slide in the **Half-side slide** submenu.

Positioning occurs in increments of 0.5 but you can enter values between 0 and 9 after the comma. If you enter a value exceeding 5.0, an error message will pop up and the previous value will be retained.

NOTICE

When the **Dispersion AUTO** function is **active**, the following values are automatically adjusted when the spreading width is changed:

- Spreading width limitation
- Metering slide position
- Half-side slide position
- Disc speed (**only for the HydroControl version**).

4.5.7 Spreading density +/-

In the **Spreading density +/-** submenu, you can specify the **step size** with which the **spreading density** is increased or decreased in the operating screen.

Determining the step size of the spreading density:

1. Call up the **Spreading mat. settings > Spreading density +/-** submenu.
2. Highlight one of the desired step sizes(**5**, **10**, **25** or **50 g/m^2**).
3. Press the **Enter key**.

▷ **The step size of the spreading density selected is automatically taken over by the control unit.**

▷ **The display shows the Spreading mat. settings menu.**

You can adjust the spreading density during spreading operation by pressing the **F3** and **F4** function keys in the operating screen.

- See also 5: Spreading operation using the QUANTRON-K2 Control unit, page 67

4.5.8 Spreading material list

In this menu, you can create and manage your own **Spreading material lists**.

NOTICE

Selecting a spreading material list influences the spreading material settings at the control unit and at the winter service spreader. The application rate setting remains unaffected.

Creating a new spreading material list

You can create up to **30** spreading material lists in the control unit.

1. Call up the **Spreading mat. Settings > Spreading material list** menu.

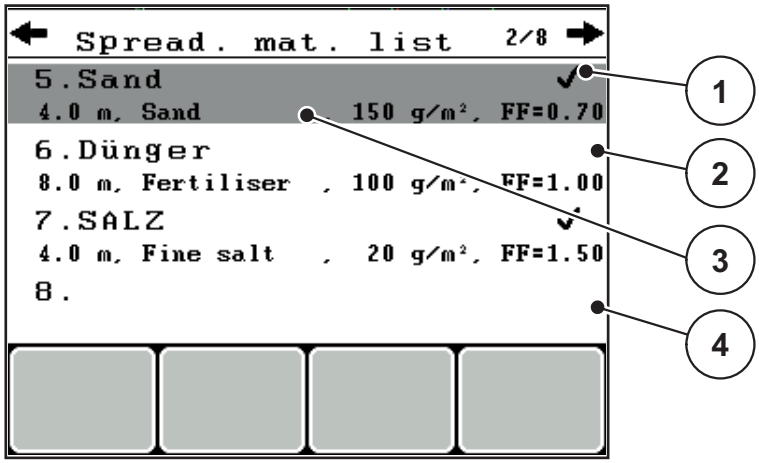


Figure 4.10: Spreading material list menu

[1] Display of the active spreading material list
[2] Display of the spreading material list filled with values
[3] Spreading material list name field
[4] Empty spreading material list

2. Highlight the **name field** of an empty spreading material list.
3. Press the **Enter key**.
   ▷ The selection window is displayed.
4. Highlight the **Open element...** option.
5. Press the **Enter key**.
   ▷ The display shows the **Spreading mat. settings** menu and the selected element is shown as the **active spreading material list** in the spreading material settings.
6. Highlight the **Spreading material name** menu entry.
7. Press the **Enter key**.
8. Enter the name for the spreading material list.

NOTICE

We recommend giving the spreading material list the name of the spreading material. Thus it is easier for you to assign a spreading material to the spreading chart.

9. Editing the parameters of the **spreading material list**.

   See chapter 4.5: Spreading material settings, page 29.

Selecting a spreading material list:

1. Call up the **Spreading mat. settings > Spreading material list** menu.
2. Highlight the desired spreading material list.
3. Press the **Enter key**.
   ▷ The selection window is displayed.
4. Highlight the **Open element...** option.
5. Press the **Enter key**.

▷ **The display shows the Spreading mat. settings menu and the selected element is shown as the active spreading material list in the spreading material settings.**

NOTICE

Selecting an existing spreading material list overwrites all values in the **Spreading mat. settings** menu with the values stored in the selected spreading material list, including the spreading density and spreading width.

Copying an existing spreading material list

1. Highlight the desired spreading material list.
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 spreading material list is now on the first free position of the list.**

Deleting an existing spreading material list

1. Highlight the desired spreading material list.
2. Press the **Enter key**.
   ▷ The selection window is displayed.
3. Highlight the **Delete element** option.
4. Press the **Enter key**.

▷ **The spreading material list is deleted from the list.**

NOTICE

The active spreading material list **cannot** be deleted.

4.6 Machine settings

The tractor and machine settings can be configured in this menu.

- Call up the **Machine settings** menu.

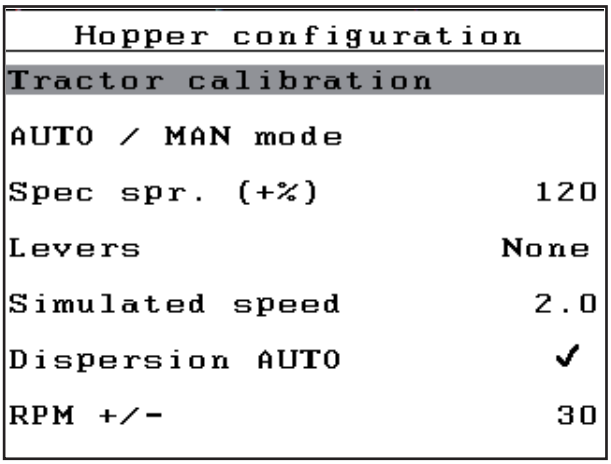


Figure 4.11: Machine settings menu

Submenu	Meaning	Description
Tractor calibration	Determining or calibrating the speed signal.	Page 43
AUTO / MAN mode	Setting the automatic or manual operating mode.	Page 46
Special spreading (+%)	Presetting for special spreading.	Page 47
Levers	Settings for the display of the spreading width limiter plates actuators.	Page 47
Simulated speed	Pre-settings for spreading with simulated speed when starting at crossings	Page 48
Dispersion AUTO	Activating/deactivating the AUTO spreading width function	Page 49
RPM +/-	Pre-settings for rotary speed changes (**HydroControl** option).	Page 49

4.6.1 Speed calibration

The speed calibration is the basic requirement for an exact spreading result. Factors such as e.g. 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 100 m is very important for the precise application rate.

- Carry out the calibration on the street. 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.

Calling up the speed settings:

In the QUANTRON-K2 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.

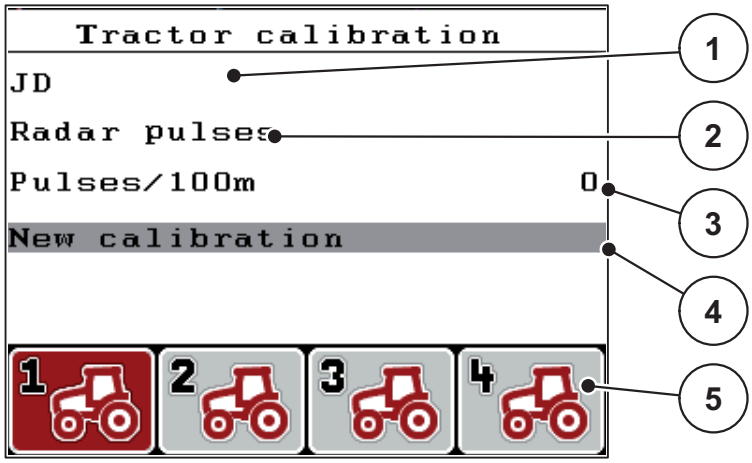


Figure 4.12: Tractor (km/h) menu

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

1. Call up the **Machine settings > Tractor calibration (km/h)** menu.

   The displayed values for name, origin and number of pulses refer to the profile highlighted in red.
2. Press the function key (**F1-F4**) under the memory location symbol.

Recalibrating the speed signal:

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

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

▷ **The calibration menu is displayed.**

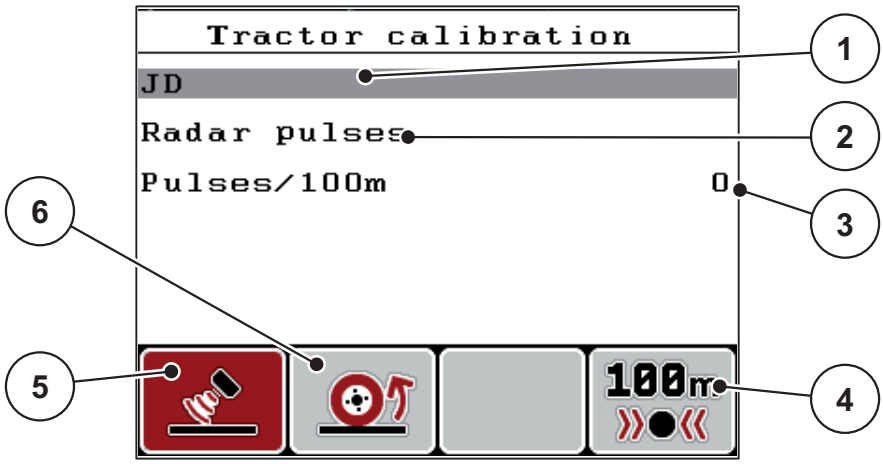


Figure 4.13: Calibration menu

[1] Tractor type name field
[2] Display of origin of speed signal
[3] Display of number of pulses over 100m
[4] F4 function key: Automatic calibration submenu
[5] F2 function key: Radar pulse transducer
[6] F1 function key: Wheel pulse transducer

4. Highlight the **Tractor name field** [1].
5. Press the **Enter key**.
6. Enter the name of the profile.

NOTICE

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

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

Entering text into the control unit is described in section 4.11.1: Text input, page 63.

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

▷ **The display shows the pulse transducer [2].**

The number of pulses of the speed signal must still be specified below. If the exact number of pulses is **known**, it can be entered directly:

8. Call up the **Tractor calibration (km/h) > New calibration** menu entry.

9. Select the Pulses/100 m [3] menu entry.

10. Press the **Enter key**.

▷ **The display shows the Pulses menu for the manual input of the pulse count.**

Entering values into the control unit is described in section 4.11.2: Input of values using the cursor keys, page 65.

If you do **not know**, the exact number of pulses, you can start the **calibration run**.

11. Press the **F4** function key.

▷ The calibration screen is displayed.

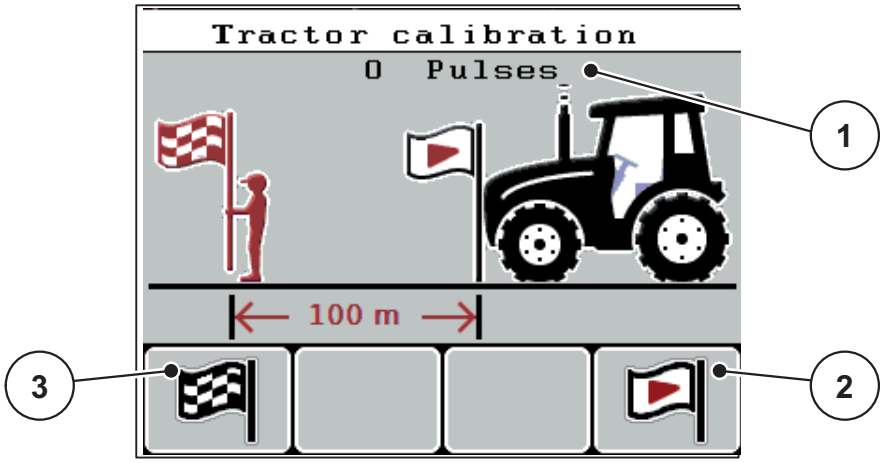


Figure 4.14: Calibration screen

[1] Pulse display
[2] F4 function key: Start recording pulses
[3] F1 function key: Stop recording pulses

12. Press the **F4 [2]** function key at the starting position of the reference distance.

▷ The pulse display is now set to zero.

▷ The control unit is ready for counting pulses.

13. Drive a reference distance of 100 m.

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

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

▷ The display shows the number of received pulses.

16. Press the **Enter key**.

▷ **The new pulse count is saved.**

▷ **This returns you to the calibration menu.**

4.6.2 AUTO / MAN mode

By default, you will work in the **AUTO km/h** operating mode. The control unit automatically controls the actuators based on the speed signal.

You will only work in the **manual** mode in the following cases:

- There is no speed signal (radar, GPS receiver or wheel sensor not available or defective).

NOTICE

For even spreading of the spreading material, it is imperative to work with a **constant forward speed** in the manual operating mode.

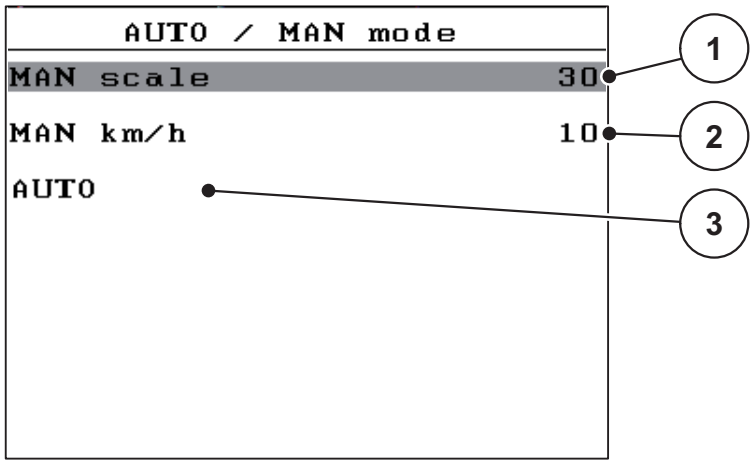


Figure 4.15: AUTO / MAN mode menu

[1] Metering slide adjustment for manual mode
[2] Forward speed adjustment for manual mode
[3] Selection of automatic mode

Selecting the operating mode

1. Switch on the QUANTRON-K2 control unit.
2. Call up the **Machine settings > AUTO/MAN** mode menu.
3. Select the desired menu item.
4. Press the **Enter key**.
5. Follow the instructions on the screen.

- Important information on the use of the operating modes during spreading operation is provided in chapter 5: Spreading operation using the QUANTRON-K2 Control unit, page 67.

NOTICE

The specified operating mode is displayed in the operating screen.
See 2.4: Display, page 9.

4.6.3 Special spreading (+%)

You can use the **Special spreading(+%)** submenu to specify a percentage **quantity change** for standard spreading.

- The basis is the pre-set value of the spreading density.
- **100 %** special spreading density corresponds to a **doubling** of the configured spreading density.

NOTICE

During operation, you can change the percentage value of the spreading quantity at any time using the **Special spreading** key. The spreading volume can **only be increased** and **cannot be reduced**.

Setting the quantity change:

1. Call up the **Machine settings > Special spreading (+%)** submenu.
2. Enter the percentage by which you wish to increase the spreading quantity.

   Entering values into the control unit is described in section 4.11.2: Input of values using the cursor keys, page 65.
3. Press the **Enter key**.

4.6.4 Levers (option)

NOTICE

The **Levers** submenu is active when **only 1** actuator is connected.

In the **Levers** submenu you enter the actuator position at which the spreading width limiter plates are installed.

NOTICE

The display shows the current position of the Spreading width limiter plates based on the values in the **Lever** submenu.

Setting	Description
R	The actuator installed at the right side of the Single-disc spreader controls the right side of the spreading width limiter plates.
L	The actuator installed at the left side of the Single-disc spreader controls the right side of the spreading width limiter plates.
R/L	The actuator installed at the left or right side of the Single-disc spreader controls the left and right sides of the spreading width limiter plate **via a lever**.

4.6.5 Simulated speed

You use the **Simulated speed** submenu to define a simulated speed for the normal spreading type.

The simulated speed can be activated when starting at crossings or traffic lights. With the simulated speed function, the metering slide opens immediately and the spreading starts with the first metre.

NOTICE

You can **only** activate the simulated speed when the tractor is at a standstill.

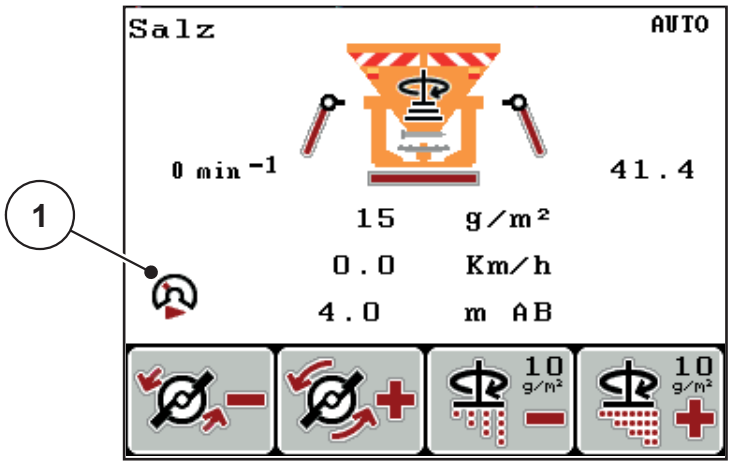


Figure 4.16: Simulated speed

Defining the simulated speed:

NOTICE

The factory setting for the simulated speed is 0.0 km/h!

1. Call up the **Machine settings > Simulated speed** submenu.
2. Enter the speed to be simulated.

   Entering values into the control unit is described in chapter 4.11.2: Input of values using the cursor keys, page 65.
3. Press the **Enter key**.

NOTICE

Spreading with the different functions of the QUANTRON-K2 control unit is described in chapter 5: Spreading operation using the QUANTRON-K2 Control unit, page 67.

4.6.6 Dispersion AUTO

Activating the **Dispersion AUTO** function allows you to automatically adjust the position of the metering slide, the position of the half-side slide and the disc speed (**HydroControl** option) when adjusting the working width.

The half-side slide has three pre-defined positions:

- Position 0: The half-side slide is open
- Position 2.5: The half-side slide closes 25% of the metering opening
- Position 5: The half-side slide closes 50% of the metering opening

1. Call up the **Machine settings > Dispersion AUTO** submenu.
2. Press the **Enter key**.

▷ **A check mark is shown in the display.**

▷ **The function is activated.**

4.6.7 Speed +/- (HydroControl option)

NOTICE

The **Speed +/-** can only be set when the **Dispersion AUTO** function **is deactivated**!

In the **Speed +/-** function, you can pre-configured a value by which the disc speed is decreased by pressing function key **F1** or increased by pressing function key **F2**.

1. Call up the **Machine settings > Speed +/-** submenu.
2. Enter the RPM by which the disc speed is to be increased/decreased.

Entering values into the control unit is described in chapter 4.11.2: Input of values using the cursor keys, page 65.

3. Press the **Enter key**.

4.7 Operating lights (SpreadLight)

In this menu, the SpreadLight function can be activated and the spreading pattern can be monitored even in the night mode.

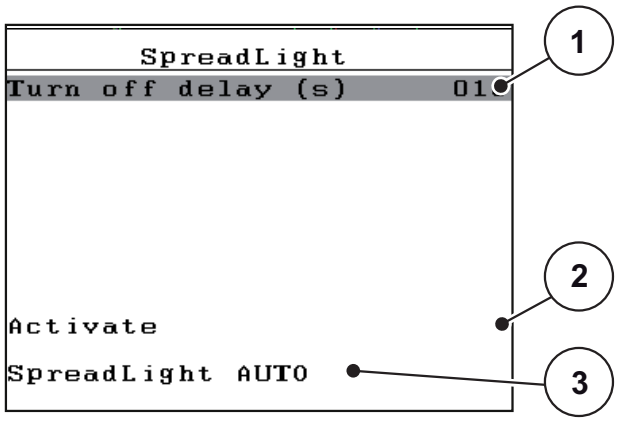


Figure 4.17: SpreadLight menu

[1] Turn off delay
[2] Switch on operating lights
[3] Activate automatic mode

The SpreadLight function has 2 modes:

Activate

The operating lights are activated and remain on until you delete the check mark or leave the menu.

1. Call up the **Main menu > SpreadLight** menu.
2. Select the **Activate** [2] menu option.
3. Press the **Enter key**.
   - ▷ **A check mark is shown in the display.**
   - ▷ **The function is activated.**
4. In the **Activate** menu entry, press the **Enter key** again.
   - ▷ **The tick disappears.**
   - ▷ **The operating lights are switched off.**

AUTO SpreadLight

In the automatic mode, the operating lights are switched on as soon as the metering slide opens and the spreading process starts.

1. Call up the **Main menu > SpreadLight** menu.
2. Select the **AUTO SpreadLight** [3] menu option.
3. Press the **Enter key**.
   - ▷ **A check mark is shown in the display.**
   - ▷ **The function is activated.**
4. Enter a **Switch-off duration** [1] in seconds.
   - Range from 0 to 100 seconds.
   - ▷ The operating lights will turn off after the entered duration has expired when the metering slide is closed.
5. In the **AUTO SpreadLight** menu entry, press the **Enter key** again.
   - ▷ **The tick disappears.**
   - ▷ **The automatic mode has been deactivated.**

NOTICE

The **SpreadLight** must be activated anew each time the machine is restarted.

4.8 Fast emptying

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

Before storing the machine, we recommend **completely opening** the metering slide by fast emptying and switching off the QUANTRON-K2 control unit in this state. This prevents accumulation of humidity in the hopper.

NOTICE

Ensure that all preconditions have been met **before starting** the fast emptying process. Observe the operating manual of the winter spreader (discharging remaining material).

Performing fast emptying:

1. Call up the **Main menu > Fast emptying** menu.

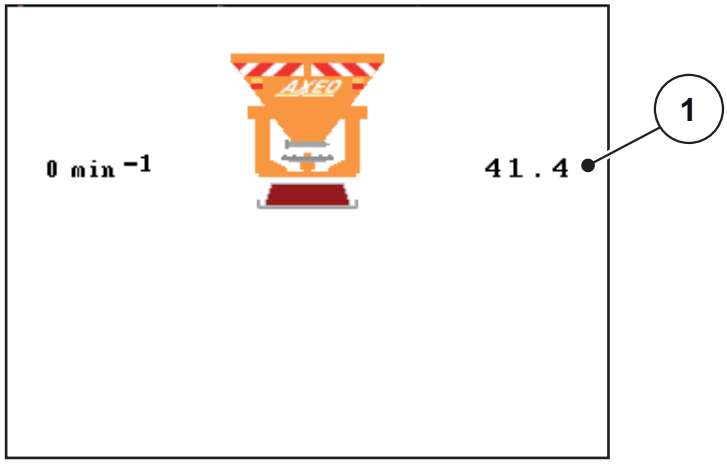


Figure 4.18: Fast emptying menu

[1] Metering slide opening display

2. Press **Start/Stop** (also press the Enter key for HydroControl).
   ▷ The fast emptying process starts.
3. Press the **Start/Stop key** again.

▷ **The fast emptying process is stopped.**

4.9 Documentation

In the **Documentation** menu, you can create and manage up to **200 files**.

- Call up the **Main menu > Documentation** menu.

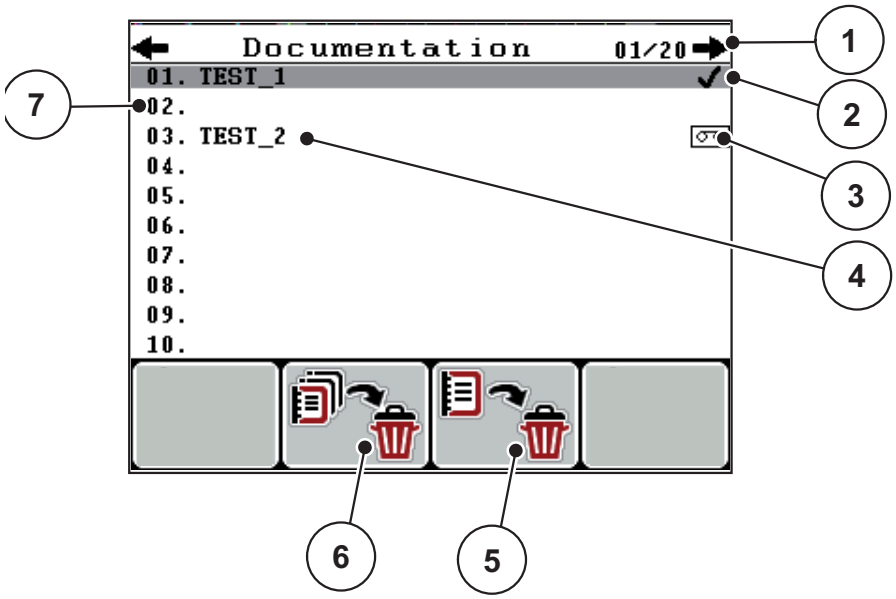


Figure 4.19: Documentation menu

[1] Display of page number
[2] Display of the documentation filled with values
[3] Display of the active documentation
[4] Documentation name
[5] F3 function key: Delete documentation
[6] F2 function key: Delete all documentation
[7] Display of storage space

4.9.1 Selecting documentation

You can re-select a previously saved documentation and proceed with it.
The data already saved in the documentation is **not overwritten**, but the new values are **added**.

NOTICE

With the **left/right arrow key** you can skip forward and back through the pages in the **Documentation** menu.

1. Select the desired documentation.
2. Press the **Enter key**.
   ▷ The display shows the first page of the current documentation.

4.9.2 Starting recording

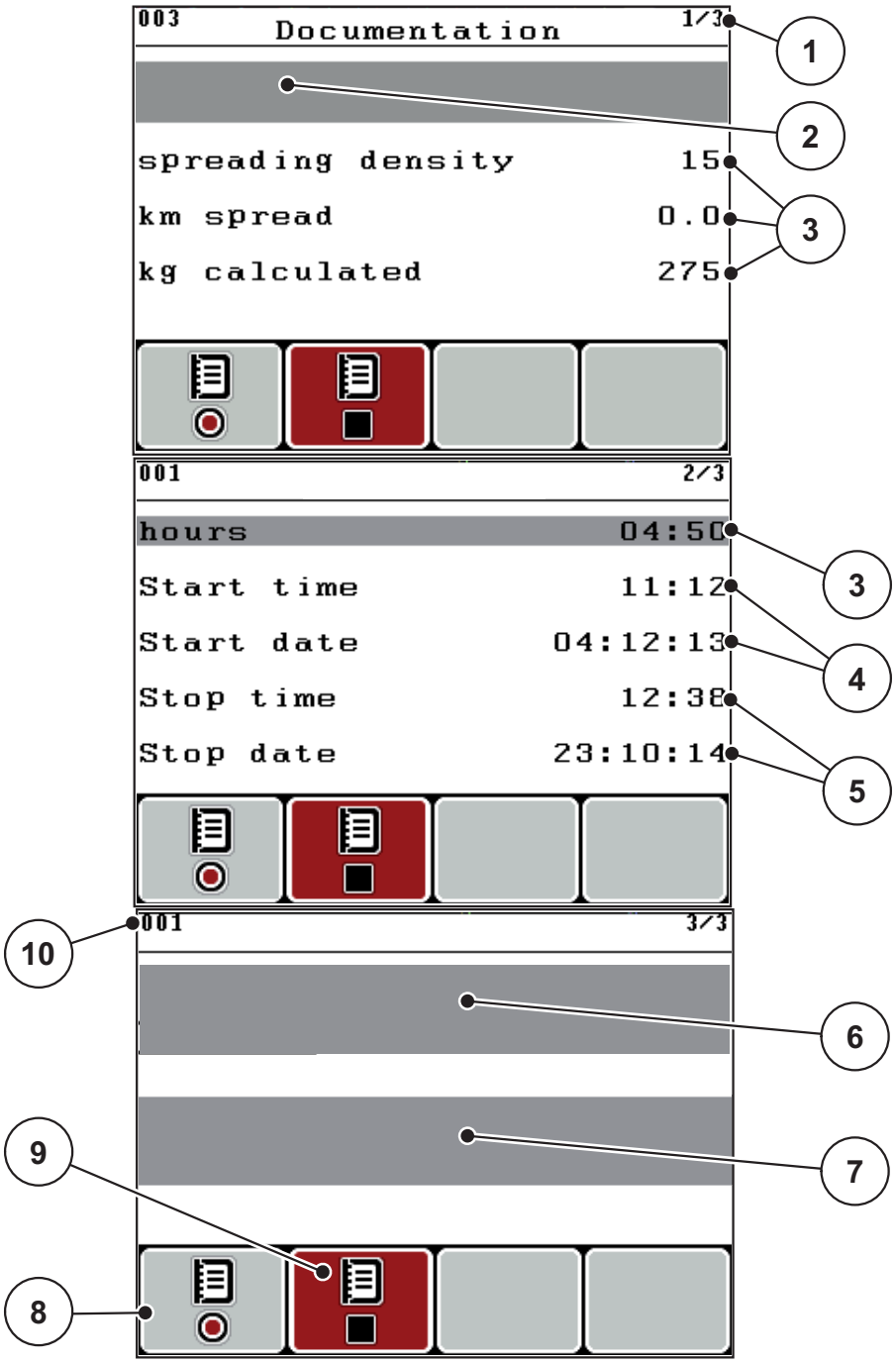


Figure 4.20: Display of current documentation

[1] Display of the page number
[2] Documentation name field
[3] Value fields
[4] Display of the start time/date
[5] Display of the stop time/date
[6] Spreading material name field
[7] Spreading material manufacturer name field
[8] Start function key
[9] Stop function key
[10] Display of storage space

3. Press the **F1** function key under the start icon.
   ▷ The recording starts.
   ▷ The **Documentation** shows the **Recording symbol** for the current documentation.
   ▷ The **operating screen** displays the **recording icon**.

NOTICE

If a different documentation is opened, the current recording is stopped.
The active documentation cannot be deleted.

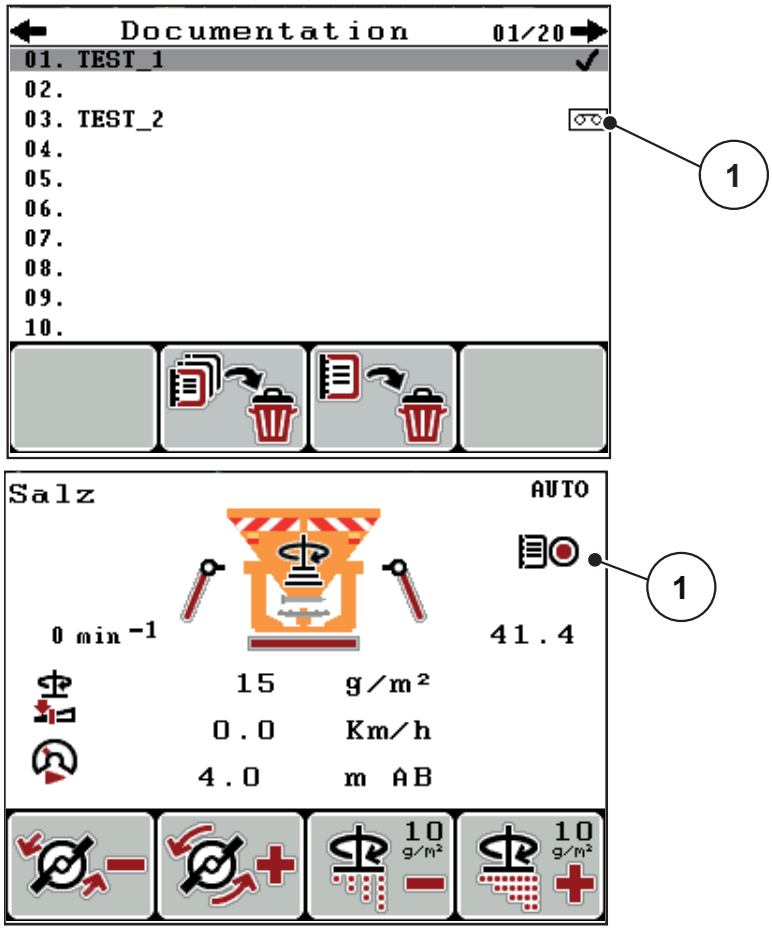


Figure 4.21: Recording symbol display

[1] Recording symbol

4.9.3 Stopping recording

1. In the **Documentation** menu, call up the 1st page of the active documentation.
2. Press the **F2** function key under the stop icon.
   ▷ The recording is stopped.

4.9.4 Deleting documentation

The QUANTRON-K2 control unit allows for deleting the recorded documentation.

NOTICE

Only the content of the documentation will be deleted, the documentation name will still be displayed in the name field!

Deleting documentation

1. Call up the **Documentation** menu.
2. Select a documentation from the list.
3. Press the **F3** function key under the **Delete** icon (see Figure 4.19).
   ▷ The selected documentation has been deleted.

Delete all documentation

1. Call up the **Documentation** menu.
2. Press the **F2** function key under the **Delete** all icon (see Figure 4.19).
   ▷ A message appears indicating that all data will be deleted. See 6.1: Meanings of the alarm messages, page 85.
3. Press the **Start/Stop**key.
   ▷ All documentation is deleted.

4.10 System / Test

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

- Call up the **Main menu > System / Test** menu.

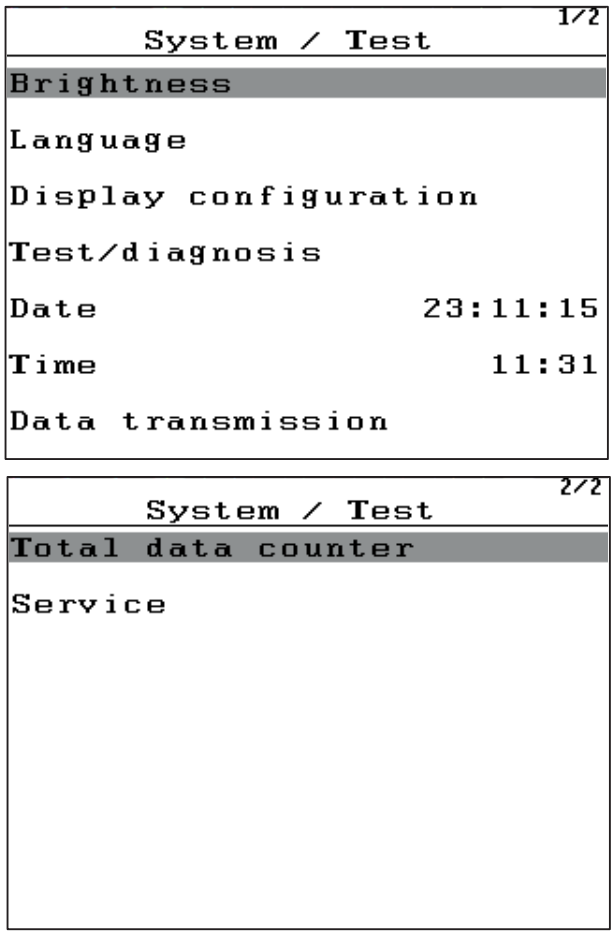


Figure 4.22: System/Test menu

Submenu	Meaning	Description
Brightness	Display settings (Brightness/Contrast).	Settings can be adjusted using the function keys **+** or **-**.
Language setting	Language setting for menu navigation.	Page 58
Display configuration	Determining the displays on the operating screen.	Page 59
Test/diagnosis	Checking of actuators and sensors.	Page 60
Date	Setting the current date.	Selection and modification of the settings by means of the **arrow keys** confirmation with **enter key**
Time	Setting the current time.	Selection and modification of the settings by means of the **arrow keys** confirmation with **enter key**

Submenu	Meaning	Description
Data transmission	Menu for data exchange and serial protocols	Page 62
Total data counter	Display/Delete all counters ● Spread quantity in kg ● Spread area in m^2 and ha ● Spread time in h ● Distance travelled in km	An enable code is required to delete all data. It can only be deleted by service personnel.
Service	Service settings	Password-protected; only accessible for service personnel

4.10.1 Setting the language

In the QUANTRON-K2 control unit, **various languages** are available.

The language package for your country is preloaded at the factory.

1. Call up **System / Test > Language settings** menu.
   ▷ The first page is displayed.

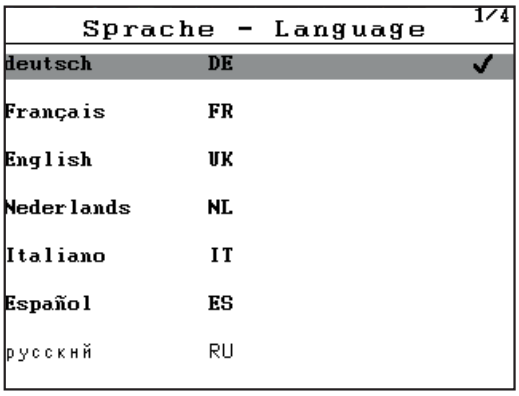


Figure 4.23: Language submenu, page 1

2. Select the desired menu language.

NOTICE

The languages are listed in several menu windows. With the **arrow keys** you can jump to the adjacent window.

3. Press the **Enter key**.

▷ **The selection is confirmed.**

▷ **The QUANTRON-K2 control unit restarts automatically.**

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

4.10.2 Display configuration

You can individually configure the display fields in the operating screen of the control unit. If necessary, two display fields can be set to the following values:

- Driving speed
- Flow factor (FF)
- Time
- ha trip
- kg trip
- km trip
- kg left
- km left
- ha left
- m AB (working width)

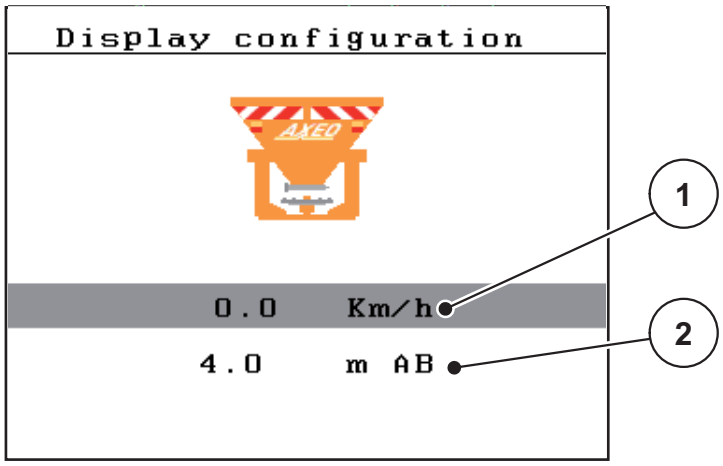


Figure 4.24: Display configuration menu

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

Select display

1. Call up the **System / Test > Display configuration**.
2. Highlight the appropriate **display field**.
3. Press the **Enter key**.
   ▷ The available displays are shown in a list.
4. Select the new value to be assigned to the display field.
5. Press the **Enter key**.
   ▷ The display shows the **operating screen**. The new values are now displayed in their appropriate **display field**.

4.10.3 Test/Diagnosis

In the **Test/Diagnosis** menu, you can monitor and check the function of some sensors/actuators.

NOTICE

This menu is for information purposes only.

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

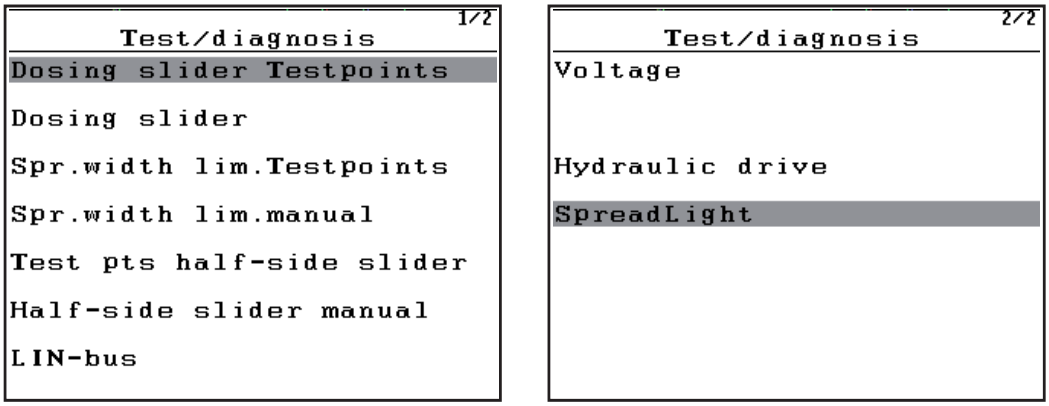


Figure 4.25: Test/Diagnosis menu

Submenu	Meaning	Description
Slide test points	Test for approaching the various position points of the metering slide.	
Metering slide	Manual actuation of the metering slide.	Page 61
Spread. width lim test points	Test for moving to the various position points of the spreading width limiter plates.	
Spread. width lim. manual	Manual movement of the spreading width limiter plates.	
Half-side slide sensor	Checking the sensors of the half-side slide.	
Test points half-side slide	Test for moving to the various position points of the half-side slide.	
Half-side slide manual	Manual actuation of the half-side slide	
LIN bus	Checking the communication of the half-side slides and SpreadLight	
Voltage	Checking the operating voltage	
HydroControl	Test and checking of the HydroControl function	
SpreadLight	Test and checking of the SpreadLight function	

Example for test/diagnosis of slides

⚠ CAUTION

Risk of injury caused by moving machine parts.

Machine parts can move automatically during the tests.

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

1. Call up the **System / Test > Test/Diagnosis** menu.
2. Highlight the **Manual metering slide** menu entry.
3. Press the **Enter key**.

   ▷ The status of the actuators/sensors is displayed.

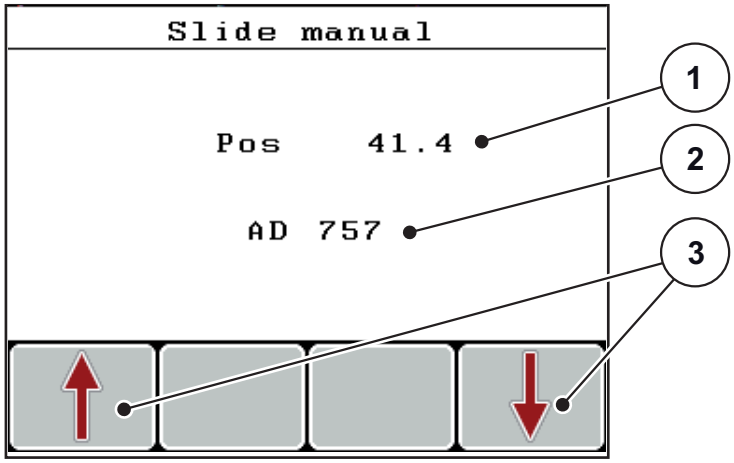


Figure 4.26: Test/diagnostics; example: Metering slide

[1] Metering slide position display
[2] Signal display
[3] Actuator function keys

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

4.10.4 Data transmission

Data transmission is carried out using data protocol LH5000.

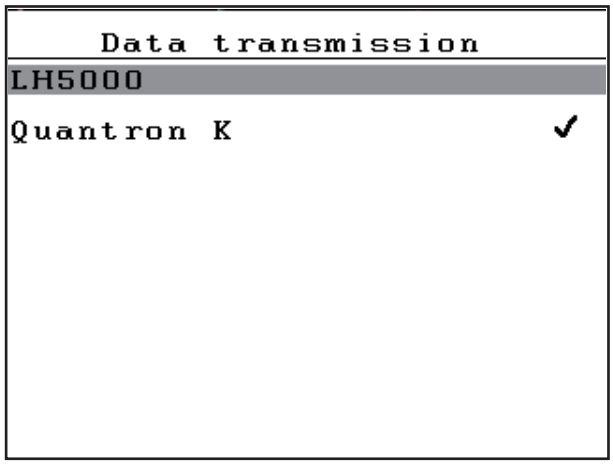


Figure 4.27: Data transmission menu

LH5000: Serial communication e.g. spreading using application cards

4.10.5 Total data counter

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

- Spread quantity in kg
- Spread area in ha and m²
- Spread time in h
- Distance travelled in km

NOTICE

This menu is for information purposes only.

4.10.6 Service

NOTICE

For adjusting the settings in the **Service** menu, an input code is required. These settings can only be modified by authorised service personnel.

As a general rule, we recommend that all settings in this menu are carried out by authorized service personnel.

4.10.7 Info

Information on the machine controller 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 Special functions

4.11.1 Text input

Freely editable text can be entered in some menus.

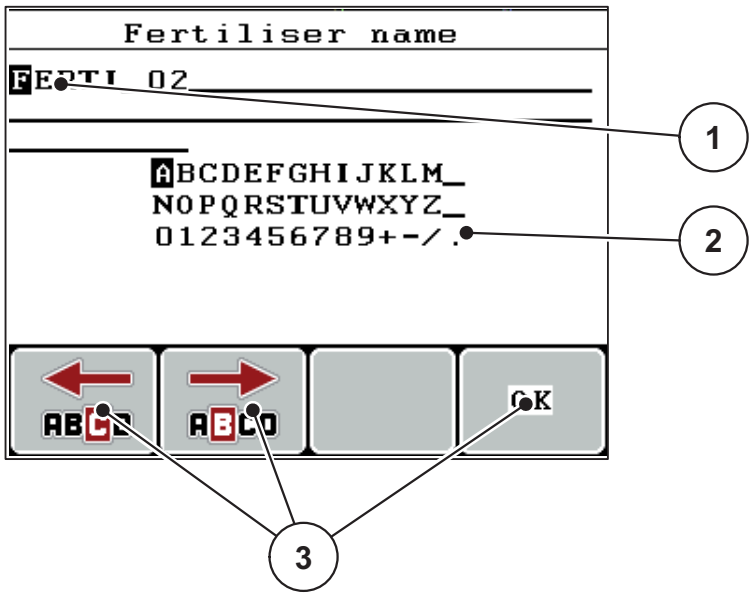


Figure 4.28: Text input menu

[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 higher level menu to the **Text input** menu.
2. Use the **F1 and F2 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. To **confirm** your input, press the **OK** [F4] 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 **F1 and F2 function keys** to move the cursor to the position of the character deleted in the input field.
2. Use the **arrow keys** to highlight the character to be written in the character field.
3. Press the **Enter key**.
   ▷ The character is overwritten.
4. To **confirm** your input, press the **OK** function key.
   ▷ The text is be saved in the control unit.
   ▷ The previous menu is shown on the display.

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. Confirm input by pressing the **OK** function key.

4.11.2 Input of values using the cursor keys

In some menus, numerical values can be entered.

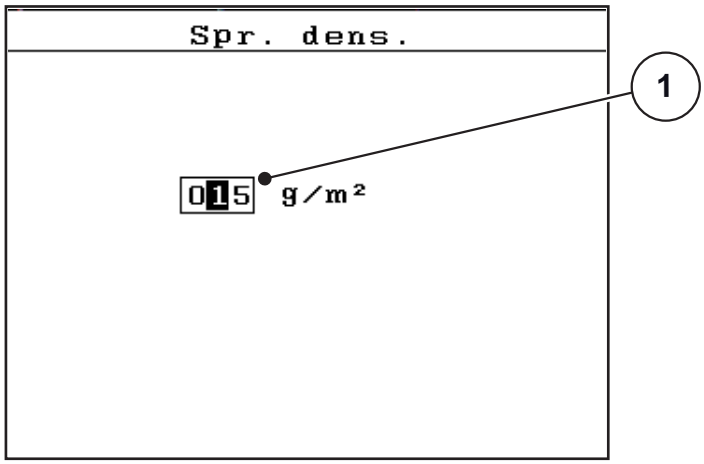


Figure 4.29: Input of numerical value (example spreading density)

[1] Input field

Preconditions:

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 key** to enter the desired 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.

5 Spreading operation using the QUANTRON-K2 Control unit

The QUANTRON-K2 Control unit supports you with the setting of your machine before you start your work. During spreading, the functions of the Control unit are also active in the background. With these functions, the spreading quality can be checked.

5.1 Minimum mass flow

A symbol indicating a minimum mass flow can appear in the **operating screen** and the **Calibration** submenu when certain settings are made to the Single-disc spreader.

- If the mass flow has been set to less than the limit of 5 kg/min, the system will **automatically** spread using the minimum mass flow of **5 kg/min**.
- In this case you **will not** spread with the spreading density you have set.
- The actual spreading density exceeds the set spreading density.

NOTICE

The minimum mass flow warning message only appears in the **MAN km/h** and **AUTO km/h** operating modes.

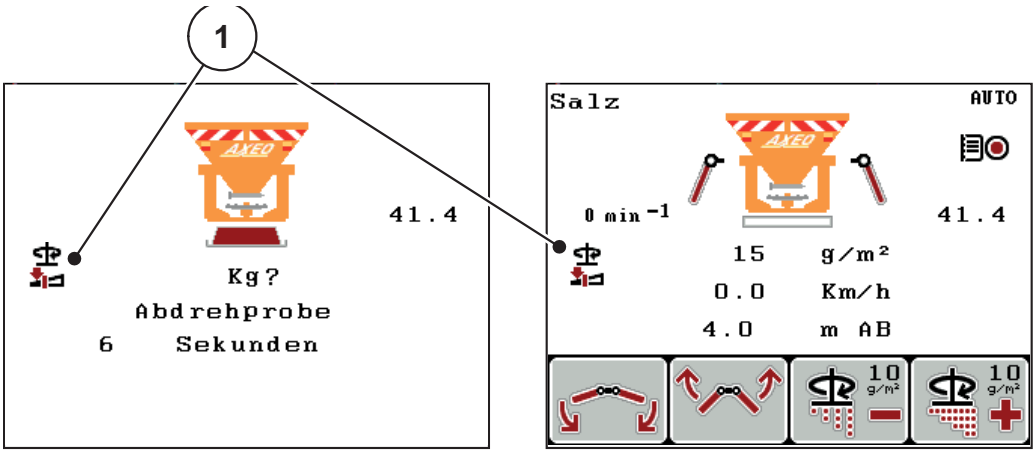


Figure 5.1: Warning symbol in the Calibration submenu and on the operating screen

[1] Minimum mass flow symbol

You can calculate the mass flow using the following formula:

$$\text{Mass flow (kg/min)} = \frac{\text{spreading density } (g/m^2) \times \text{Spreading width (m)} \times \text{Speed (km/h)}}{60}$$

Example: For example, to work above a minimum mass flow of 5 kg/min, the following values have to be set:

$$\frac{25\ g/m^2 \times 4\ m \times 5\ km/h}{60} = 8.33\ kg/min$$

NOTICE

Contact your dealer or the manufacturer if you wish to set a minimum mass flow that is different to **5 kg/min**. You Control unit will configure these values on request.

5.2 Adjusting the spreading width during spreading operation

The various settings for the spreading width limiter allow spreading widths of **1 m to 10 m** at a mounting height of **approx. 55 cm** (see operating manual for the AXEO winter spreader).

Depending on the equipment of your machine, various spreading width configurations are available.

⚠ CAUTION

Environmental damage due to incorrect machine settings

When the **Dispersion AUTO** function is deactivated, the disc speed and position of the spreading width limiter plates are **not automatically** adjusted to the reduced spreading width. There is a risk of environmental damage due to incorrect configurations.

- ▶ Adjust the RPM of the spreading disc / the position of the dispersion limiter plates at the operating screen with the F1 and F2 function keys. The symbols can be accessed by pressing the L/R key repeatedly.
- ▶ Only deactivate the **Dispersion AUTO** when absolutely necessary.

5.2.1 Winter service spreader with one actuator for the spreading width limiter

Without lever (Dispersion AUTO deactivated)

By default, the actuator for the spreading width limiter is installed on the right side (in the direction of travel). See 4.6.4: Levers (option), page 47.

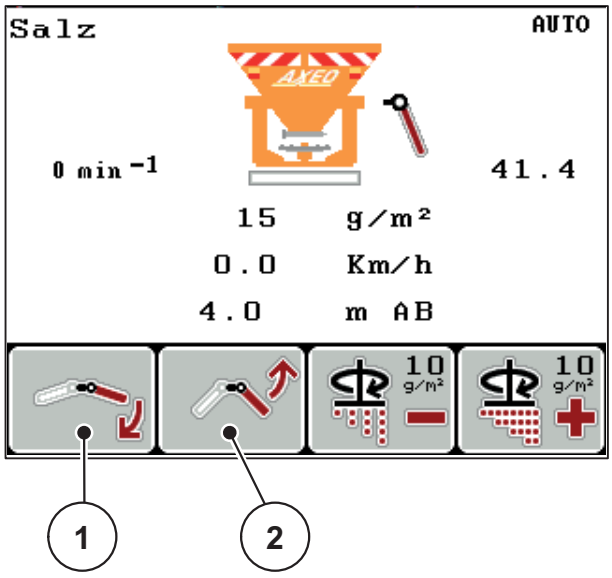


Figure 5.2: Spreading width adjustment with one actuator

- To actuate the right spreading width limiter plates, press the F1 or F2 function key.
  - F1 [1]: Lowering the right spreading width limiter plates
  - F2 [2]: Raising the right spreading width limiter plates

Without lever (Dispersion AUTO deactivated)

The actuator is connected to both sides of the spreading width limiter plates by the optionally available levers. This option enables symmetrical spreading width adjustment.

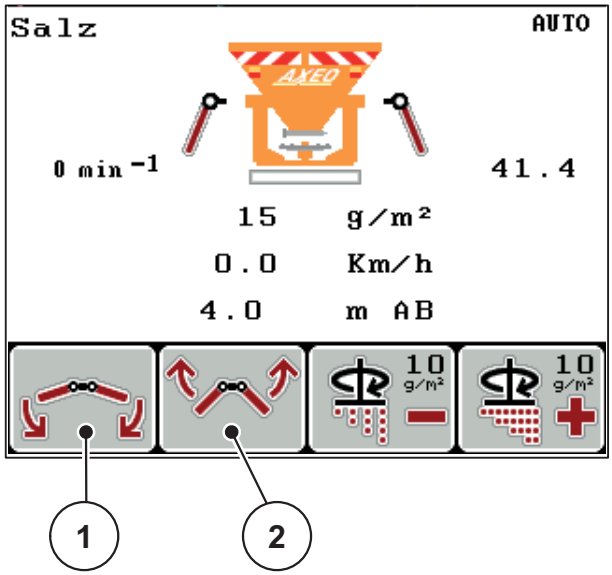


Figure 5.3: Spreading width adjustment with levers

[1] F1: Lowering the spreading width limiter plates
[2] F2: Raising the spreading width limiter plates

5.2.2 Winter spreader with two actuators for the spreading width limiter (Dispersion AUTO deactivated)

The option with 2 installed actuators enables switching from a symmetric to an asymmetric spreading pattern while spreading.

1. Select the desired function for spreading width limitation using the **L/R** key.

   Select the side for the spreading width limiter plates that you wish to adjust by pressing the **L/R** key multiple times.

   - Left
   - Right

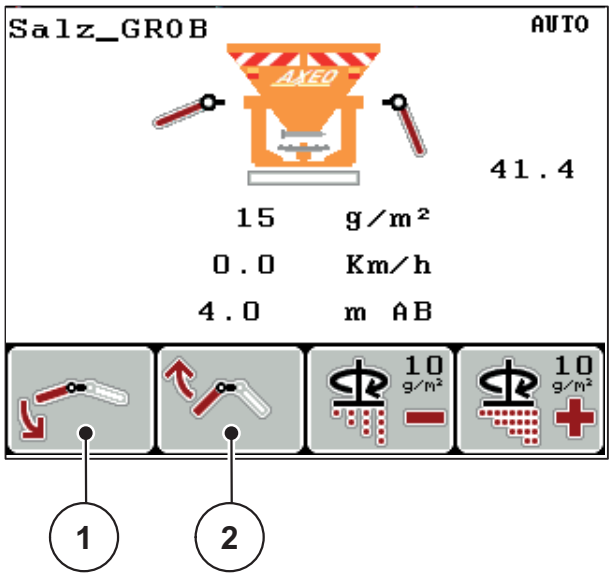


Figure 5.4: Asymmetric spreading pattern (example)

Spreading width adjustment to the road during spreading operation.

- F1 [1]: Lower the spreading width limiter plates on the desired side.
- F2 [2]: Raise the spreading width limiter plates on the desired side.

NOTICE

The position of the half-side slide must be adjusted to ensure even lateral distribution.

NOTICE

More information on settings for the half-side slide is provided in the operating manual for the AXEO winter spreader, chapter 7.7.

To restore a symmetrical spreading pattern, proceed as follows.

1. Select the desired adjustment function using the **L/R** key.
2. Bring the left or right side to the same position using the **F1** or **F2** key.
3. Press the **L/R** key until both sides can be adjusted simultaneously (see Figure 5.7)

▷ **The spreading pattern is symmetrical.**

NOTICE

The symmetrical spreading pattern is active as soon as both sides can be adjusted simultaneously (refer to Figure 5.7) and the actuators are set to one of the limit stops (bottom or top).

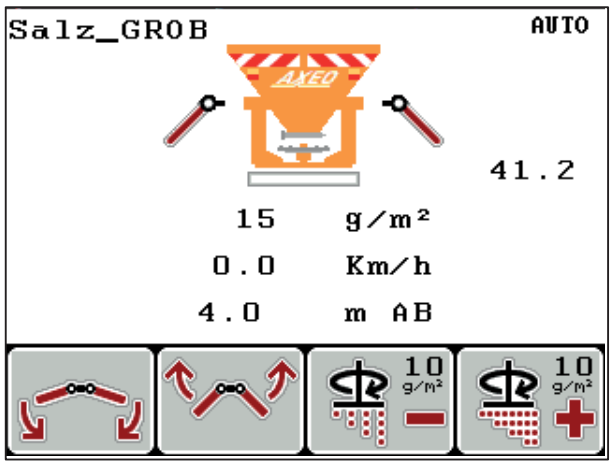


Figure 5.5: Symmetrical spreading pattern

5.2.3 Winter service spreader with two actuators for the spreading width limiter and an actuator for the half-side slide (Dispersion AUTO deactivated)

The option with 2 installed actuators for spreading width limitation and actuator for the half-side slide enables switching from a symmetric to an asymmetric spreading pattern with adjustment of the application rate while spreading.

1. Select the desired function for spreading width limitation using the **L/R** key.

   Select the side for the spreading width limiter plates that you wish to adjust by pressing the **L/R** key multiple times.

   - Left
   - Right

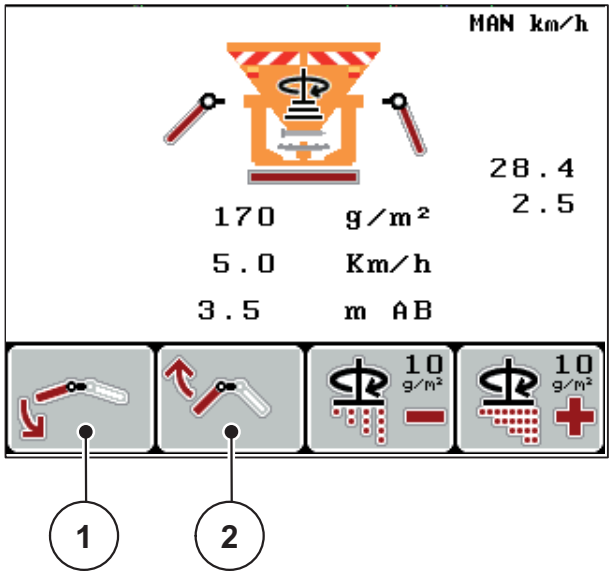


Figure 5.6: Asymmetric spreading pattern (example)

Spreading width adjustment to the road during spreading operation.

- F1 [1]: Lower the spreading width limiter plates on the desired side.
- F2 [2]: Raise the spreading width limiter plates on the desired side.
- Use the **Menu** key to navigate to the Half-side slide menu and set the desired value.

To restore a symmetrical spreading pattern, proceed as follows.

1. Select the desired adjustment function using the **L/R** key.
2. Bring the left or right side to the same position using the **F1** or **F2** key.
3. Press the **L/R** key until both sides can be adjusted simultaneously (see Figure 5.7)
4. Select the position 0.0 in the **Half-side slide** menu

▷ **The spreading pattern is symmetrical.**

NOTICE

The symmetrical spreading pattern is active as soon as both sides can be adjusted simultaneously (refer to Figure 5.7) and the actuators are set to one of the limit stops (bottom or top).

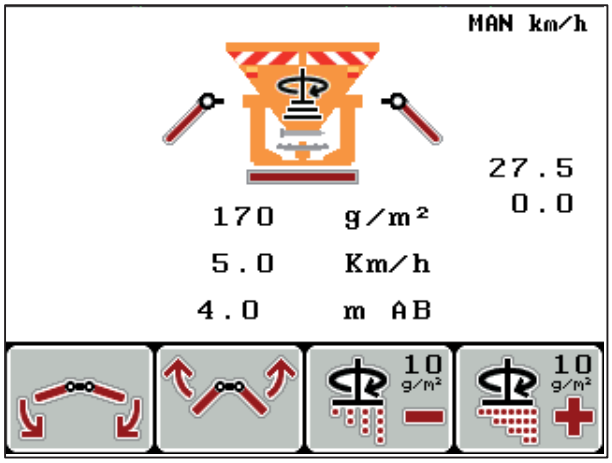


Figure 5.7: Symmetrical spreading pattern

5.2.4 Adjusting the spreading width using the Dispersion AUTO function

Winter service spreader with HydroControl (Q-100-HC, Q-200-HC)

- Press the **L/R** key multiple times until the display shows the symbols [1] for adjusting the working width.

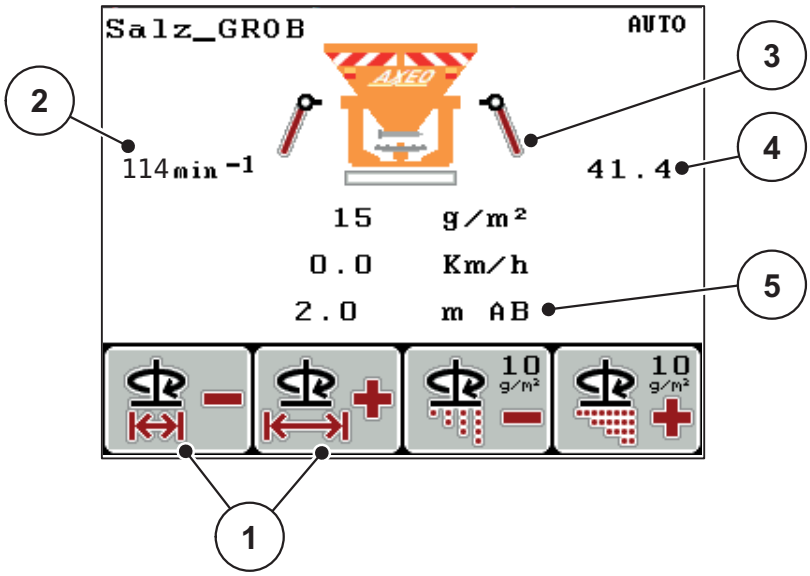


Figure 5.8: Working width adjustment (Dispersion AUTO function activated)

When adjusting the working width [5] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically adjusts the disc speed [2], the position of the metering slide [4] (depending on the forward speed) as well as the spreading width limiter plates [3].

Winter service spreader without HydroControl (Q, Q-100, Q-200)

- Press the **L/R** key multiple times until the display shows the symbols [1] for adjusting the working width.

When adjusting the working width [5] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically adjusts the position of the metering slide [4] (depending on the forward speed) as well as the spreading width limiter plates [3].

5.2.5 Adjusting the spreading width with the Dispersion AUTO function and actuator for the half-side slide

Winter service spreader with HydroControl (Q-100-HC, Q-200-HC)

- Press the **L/R** key multiple times until the display shows the symbols [1] for adjusting the left or right spreading width.

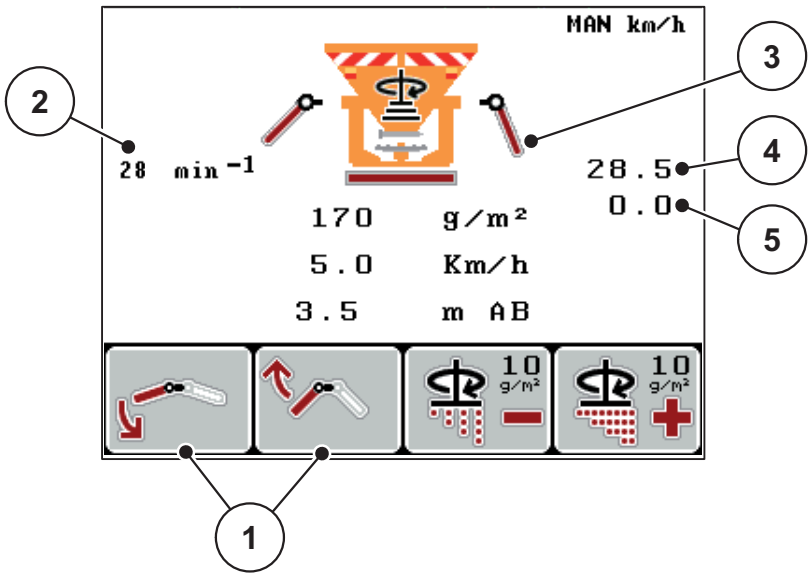


Figure 5.9: Working width adjustment (Dispersion AUTO function activated)

When adjusting the spreading width limitation [3] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically adjusts the disc speed [2], the position of the metering slide [4] (depending on the forward speed) as well as the position of the half-side slide [5].

Winter service spreader without HydroControl (Q, Q-100, Q-200)

- Press the **L/R** key multiple times until the display shows the symbols [1] for adjusting the left or right spreading width.

When adjusting the spreading width limitation [3] using the F1 and F2 [1] function keys, the QUANTRON-K2 control unit automatically adjusts the position of the metering slide [4] (depending on the forward speed) as well as the position of the half-side slide [5].

5.3 Half-side slide

If the half-side slide at the winter service spreader is adjusted (closed position), the QUANTRON-K2 control unit displays the respective symbol on the operating screen.

- See Figure 2.3 in the 2.4: Display, page 9 sub-chapter.

NOTICE

The half-side slide cannot be controlled by the QUANTRON-K2 control unit. The symbol on the operating screen is only for information.

- Observe the operating manual for the AXEO winter spreader and especially the **Machine settings** chapter.

5.4 Spreading with AUTO km/h operating mode

In AUTO km/h operating mode, the control unit automatically controls the position of the metering slide based on the speed signal.

1. Switch on the QUANTRON-K2 control unit.
2. Make the spreading material settings:
   - Spreading density (g/m²)
   - Spreading width (m)
3. Fill in the spreading material.

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.

4. Perform calibration for flow factor determination

   or

   Obtain the flow factor from the spreading material chart.
5. Enter the flow factor manually.
6. Press **Start/Stop** (also press the Enter key for HydroControl).

▷ **The spreading starts.**

5.5 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-K2 control unit.
2. Call up the **Machine settings > AUTO/MAN mode** menu.
3. Highlight the **MAN km/h** menu entry.
4. Press the **Enter key**.
5. Enter the forward speed.
6. Press the **Enter key**.
7. Make the spreading material settings:
   - Spreading density (g/m²)
   - Spreading width (m)
8. Fill in the spreading material.

NOTICE

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

9. Perform calibration for flow factor determination

   or

   Obtain the flow factor from the spreading material chart.
10. Enter the flow factor manually.
11. Press **Start/Stop** (also press the Enter key for HydroControl).

▷ **The spreading starts.**

NOTICE

Always observe the set speed during spreading.

5.6 Spreading in the MAN scale operating mode

In the **MAN scale** operating mode, you can manually change the metering slide openings during the spreading operation.

Preconditions:

- The metering slide is open (activation via the **start/stop key**).

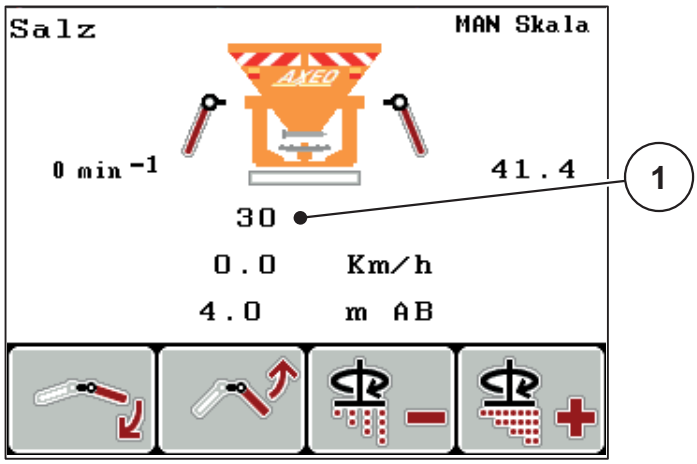


Figure 5.10: MAN scale operating screen

[1] Display of current metering slide scale position

1. Switch on the QUANTRON-K2 control unit.
2. Call up the **Machine settings > AUTO/MAN mode** menu.
3. Highlight the **MAN scale** menu entry.
4. Press the **Enter key**.
5. Enter the position of the metering slide.
6. Press the **Enter key**.
7. Navigate to the **operating screen**.
8. Press **Start/Stop** (also press the Enter key for HydroControl).

▷ **The spreading starts.**

9. To change the metering slide opening, press the function key **F3** or **F4**.

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

   F4: **MAN+** to increase 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.

5.7 Spreading with the special spreading function

- For proportional adjustment of the quantity change, refer to chapter 4.6.3: Special spreading (+%), page 47.

1. Navigate to the **operating screen**.

   See 4.2: Navigation within the menus, page 23.

2. Hold the **Special spreading** key pressed while spreading.

   ▷ See 2.3: Control elements, page 7.

▷ **Spreading with the preconfigured additional quantity is activated.**

NOTICE

The additional quantity is only spread as long as you hold the **Special spreading** key pressed.

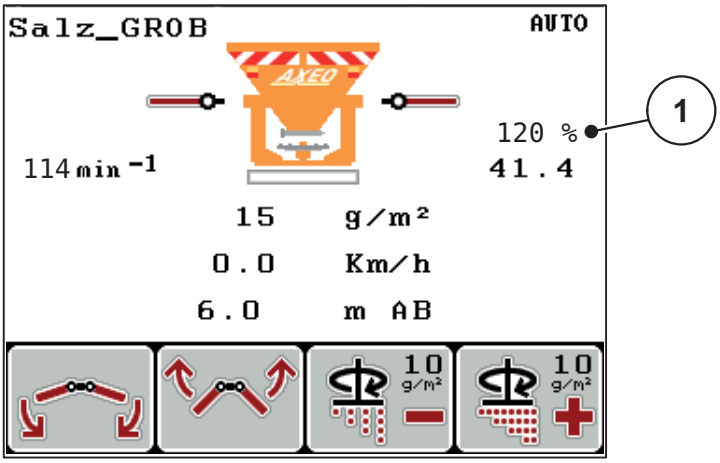


Figure 5.11: Special spreading

5.8 Spreading with simulated speed

NOTICE

You can **only** activate the simulated speed when the tractor is at a standstill.

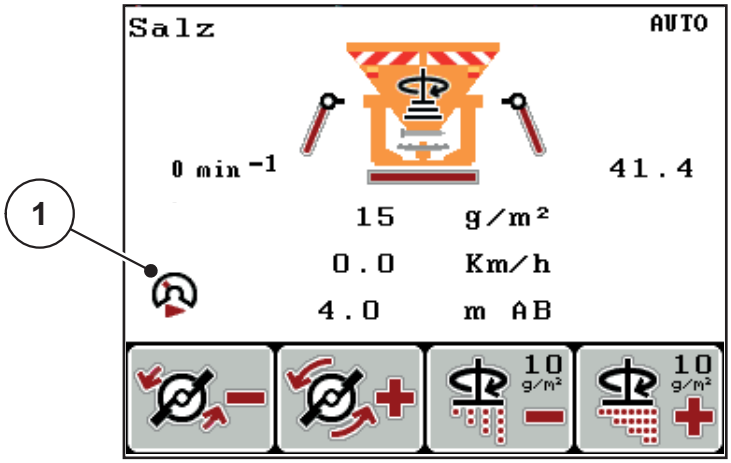


Figure 5.12: Simulated speed

1. Navigate to the operating screen.

   See 4.2: Navigation within the menus, page 23

2. Press the **Special spreading** key once while at a standstill.

   See 2.3: Control elements, page 7).

   ▷ On the display, the [1] symbol is displayed.

▷ **The simulated speed is activated.**

NOTICE

The simulated speed remains active until it is exceeded by the actual speed. After exceeding the simulated speed, the application rate is calculated based on the actual speed.

NOTICE

Deactivate the simulated speed by pressing the **Special spreading** key again.

5.9 Spreading density adjustment

You can adjust the spreading density during spreading operation by pressing the **F3** and **F4** function keys in the operating screen.

Precondition

- You have set the desired step size in the **Spreading mat. settings > Spreading density +/-** submenu. See 4.5.7: Spreading density +/-, page 39.

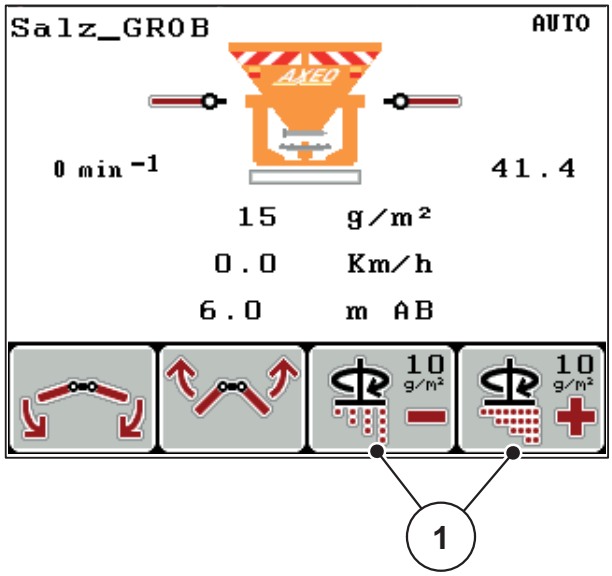


Figure 5.13: Spreading density adjustment

5.10 Disc speed adjustment (HydroControl only)

NOTICE

Speed adjustment is only possible with **deactivated Auto spreading width**!

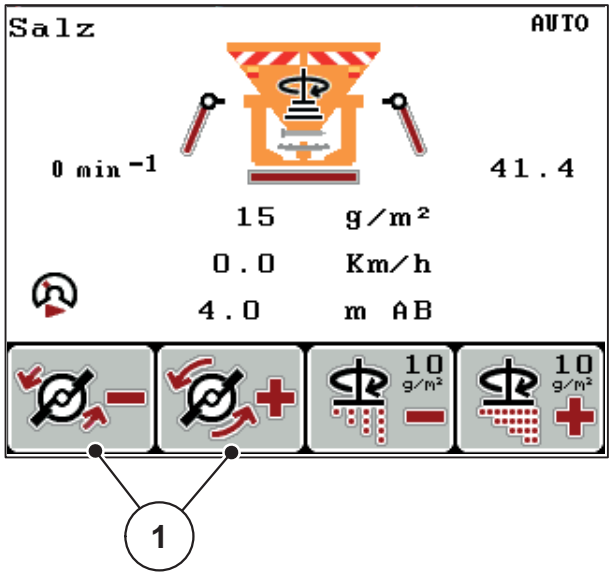


Figure 5.14: Disc speed adjustment

1. Press the **L/R** key until the display shows the Speed +/- function above function keys F1/F2.

   F1: **Speed -** to reduce the disc speed.

   F2: **Speed +** to increase the disc speed

6 Alarm messages and possible causes

Various alarm messages can be displayed on the QUANTRON-K2 Control unit.

6.1 Meanings of the alarm messages

No.	Message in display	Meaning ● **Possible cause**
1	Fault in dosing system. Stop!	The actuator for the metering system cannot reach the set value it is to be moved to. ● 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 application rate exceeds the maximum metering opening.
3	Flow factor is outside limits.	The flow factor must lie within a range between **0.40 - 2.10**. ● The newly calculated or entered flow factor is outside the range.
7	Data will be deleted! Delete = START Cancel = ESC	Safety alarm to prevent the unintentional deletion of data.
8	Spreading density Min. setting = 5 Max. setting = 40	Reference to the value range of the **Spreading density** for dewing spreading material. ● The entered value lies outside the reference values.
9	Spreading density Min. setting = 75 Max. setting = 300	Reference to the value range of the **Spreading density** for blunting spreading material. ● The entered value lies outside the reference values.
10	Spreading density Min. setting = 1 Max. setting = 10	Reference to the value range of the **Spreading density** for fertiliser. ● The entered value lies outside the reference values.
11	Working width Min. setting = 1 Max. setting = 10	Reference to the value range of the **Working width**. ● The entered value lies outside the reference values.

No.	Message in display	Meaning ● **Possible cause**
12	Flow factor is outside limits.	Reference to the value range of the **Flow factor**. ● The entered value lies outside the reference values.
13	Transmission fault. No RS232 connection	An error has occurred during data transmission to the Control unit. The data has not been transmitted.
14	Error at spreading width limiter	The actuator cannot reach the target value it is to be moved to. ● Blockage ● No position feedback
15	Memory full. Delete one private fertiliser chart.	A maximum of 30 spreading materials can be saved. ● No additional saving possible
17	Discs started up without activation	A speed pulse is applied although the spreading disc drive has not been started, i.e., the speed exceeds 20 rpm
18	Activate disc start. Confirm with ENTER	Before the PWM outlet is activated, a confirmation prompt is displayed
19	Meter. slider ist closed. Turn off agitator	Metering slide closed. The speed sensor reports a speed greater 20 1/min.
20	max. RPM reached! Max. setting = 250	In the coarse salt, fine salt, damp salt, grit and sand characteristic curves, a speed greater than 250 min is supposed to be reached.
21	Disc speed not reached.	The hydraulic motor cannot reach the set speed! ● Not enough oil in the motor
22	Error at half-side slider	The actuator cannot reach the target value it is to be moved to. ● Blockage ● No position feedback
72	Error at SpreadLight	The power supply is too high; the operating lights are switched off.
73	Error at SpreadLight	Overload
74	Defect at SpreadLight	Connection error ● Defective cable ● Loose plug connector

6.2 Clearing a fault/alarm

6.2.1 Acknowledging an alarm message

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

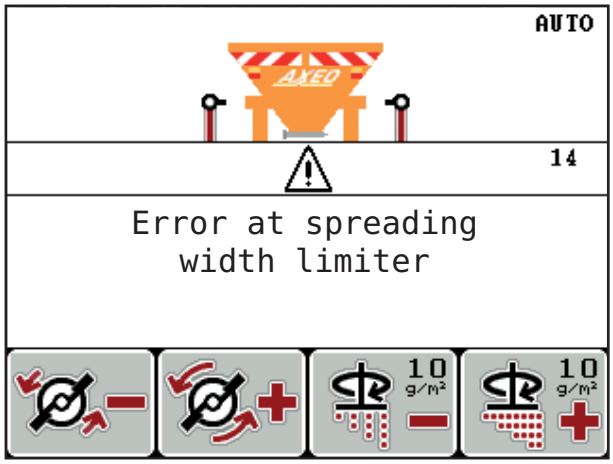


Figure 6.1: Alarm message (example: spreading width limiter)

Acknowledging an alarm message:

1. Correct the cause of the alarm message.

   Observe the winter spreader operating manual and section 6.1: Meanings of the alarm messages, page 85.

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

▷ **The alarm message is cleared.**

7 Special equipment/options

Illustration	Designation
	GPS cable and receiver
	Universal holder
	Forward speed sensor
	Perforated disc parts set (forward speed sensor accessory)
	Extension cable 4.5 m

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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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RAUCH Landmaschinenfabrik GmbH

Landstraße 14 · D-76547 Sinzheim
Victoria-Boulevard E200 · D-77836 Rheinmünster

info@rauch.de · www.rauch.de

Phone +49 (0) 7221/985-0
Fax +49 (0) 7221/985-200